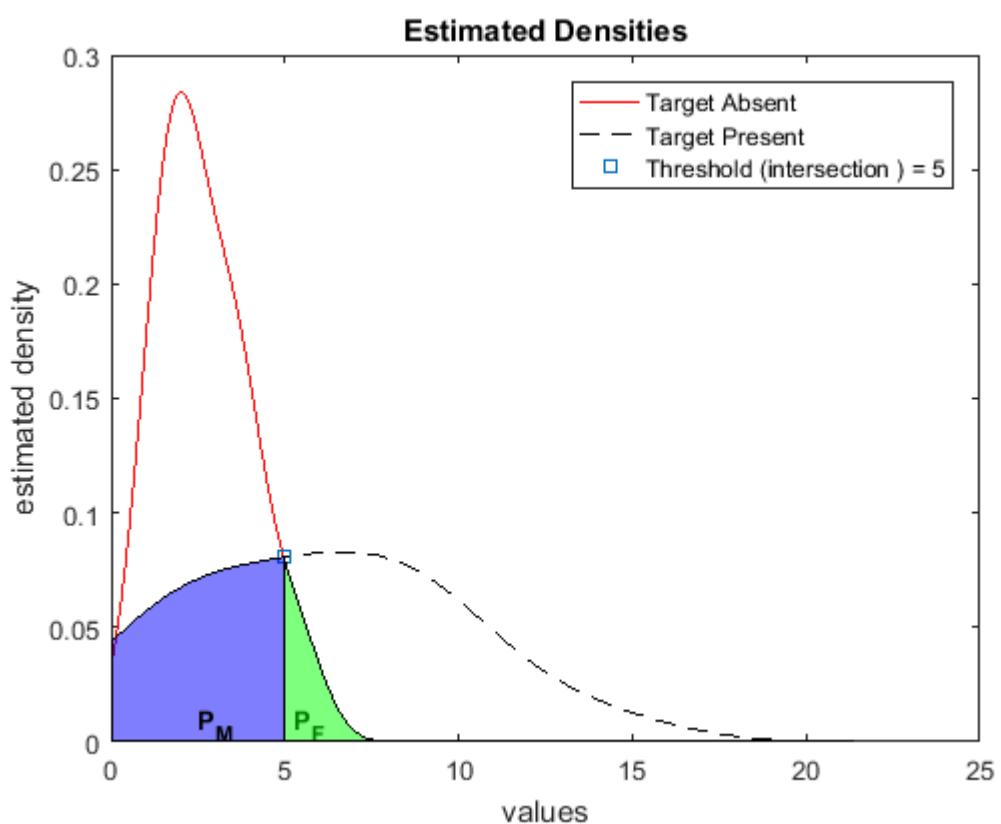


data (Almakyn)

Target Absent					Target Present				
2.51	2.347	2.284	3.508	3.623	8.215	9.148	6.003	0.928	4.321
1.42	2.332	5.788	3.713	2.435	6.311	9.331	1.709	1.191	6.372
3.049	0.857	1.549	3.687	1.662	9.792	8.185	5.143	8.769	4.99
4.89	1.638	2.532	1.914	5.377	3.255	1.82	5.641	6.106	14.251
1.282	1.907	1.429	0.954	1.64	1.66	10.606	0.275	1.432	13.37
3.525	2.737	2.633	1.632	1.728	8.856	7.951	2.654	9.485	3.677
2.087	4.975	0.966	3.64	4.349					
2.445	3.511	1.656	3.898	3.713					

(c) P. M. Shankar



Confusion Matrix: Threshold (intersection) = 5

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	2	38
	Target Present	18	12
	Total Counts	20	50

dist to top left corner of the ROC curve = 0.403

Transition Matrix: Threshold (intersection) = 5

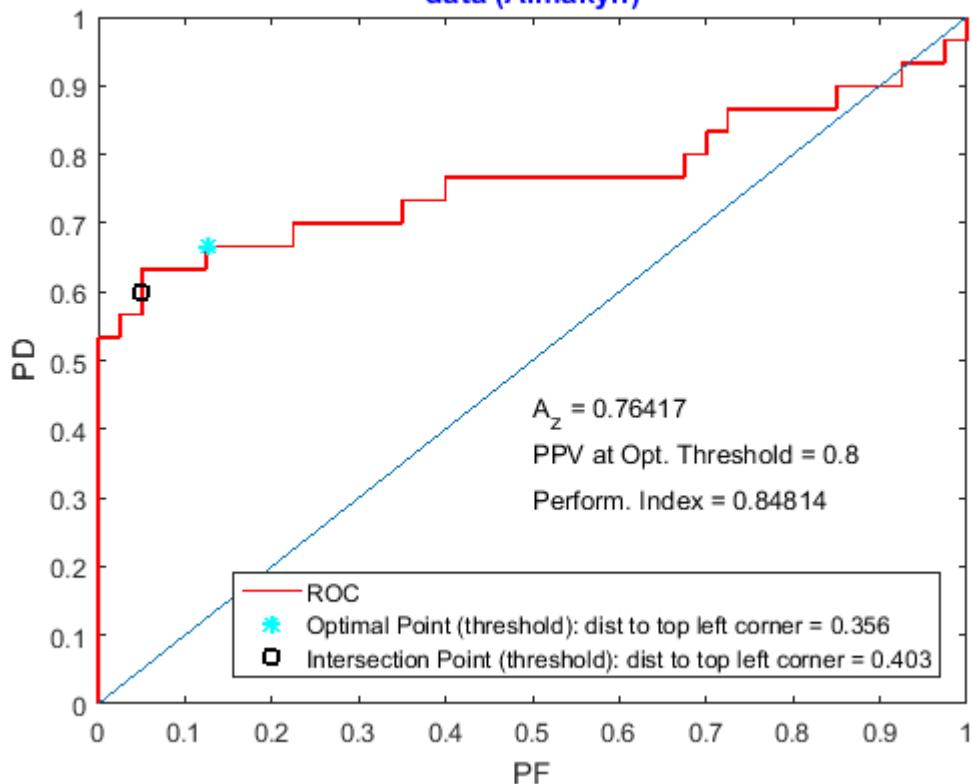
$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

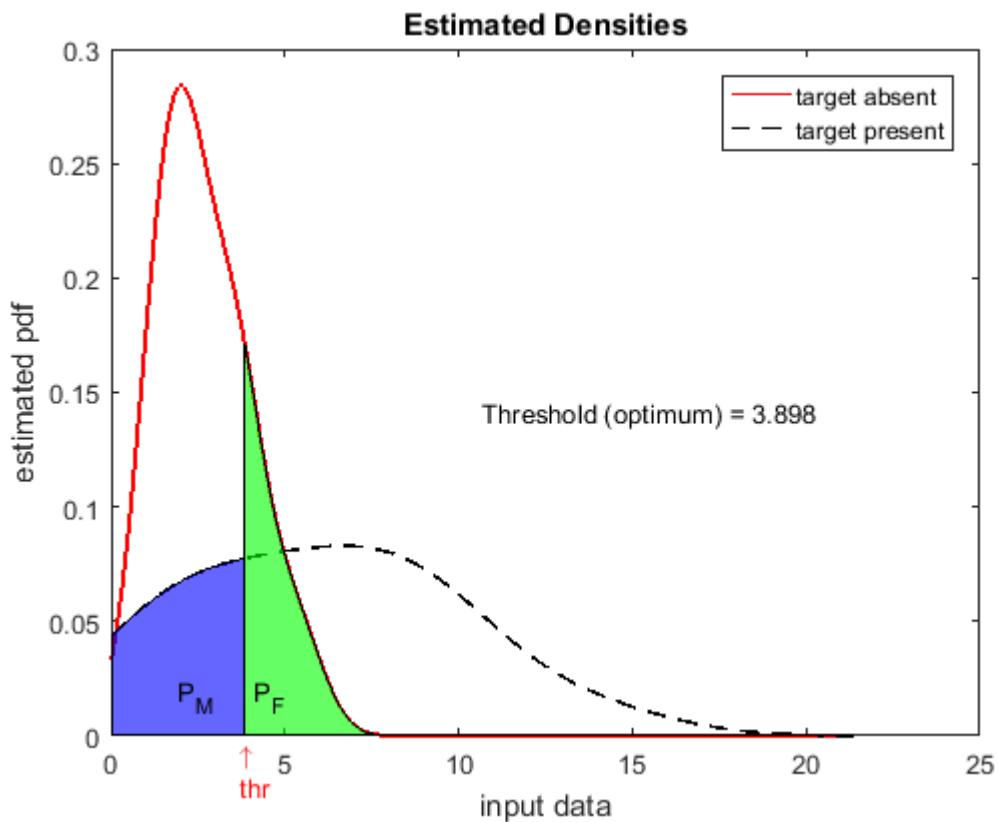
$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{19}{20} & \frac{2}{5} \\ \frac{1}{20} & \frac{3}{5} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.95 & 0.4 \\ 0.05 & 0.6 \end{bmatrix}$$

$$P_F = \frac{1}{20} = 0.05 \quad P_M = \frac{2}{5} = 0.4 \quad \text{PPV} = \frac{9}{10} = 0.9$$

p m shankar

data (Almakyn)





Confusion Matrix : Threshold (optimum) = 3.898

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	5	35
	Target Present	20	10
	Total Counts	25	45

dist to top left corner of the ROC curve = 0.356

Transition Matrix: Threshold (optimum) = 3.898

$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{7}{8} & \frac{1}{3} \\ \frac{1}{8} & \frac{2}{3} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.875 & 0.3333 \\ 0.125 & 0.6667 \end{bmatrix}$$

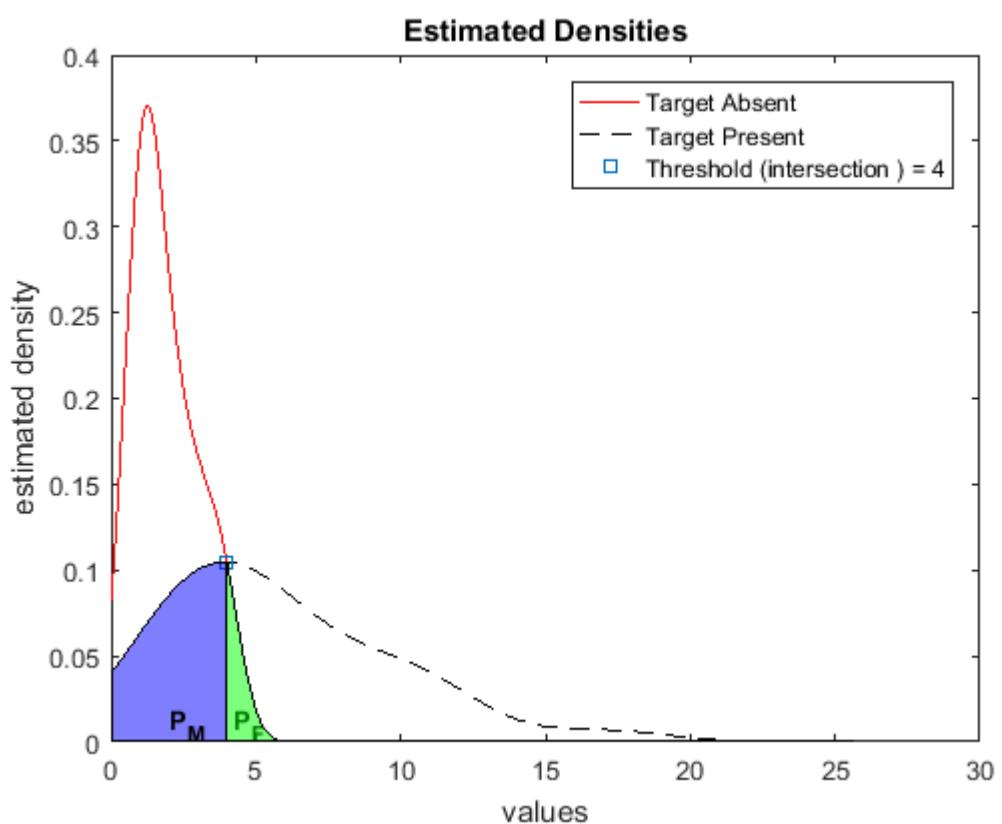
$$P_F = \frac{1}{8} = 0.125 \quad P_M = \frac{1}{3} = 0.3333 \quad \text{PPV} = \frac{4}{5} = 0.8$$

p m shankar

data (Anderson R)

Target Absent					Target Present				
1.719	1.162	3.435	2.323	2.111	3.383	11.306	10.273	2.174	5.984
3.321	1.181	1.324	3.798	3.355	9.547	7.431	1.902	3.624	1.126
2.075	0.91	4.424	1.476	1.269	6.783	2.572	3.877	4.843	17.115
1.132	0.984	2.358	2.431	1.161	5.49	8.124	5.071	4.793	6.705
2.678	1.772	3.986	0.806	1.242	1.947	5.09	9.408	4.387	2.24
1.291	1.472	1.594	1.736	0.869	3.912	1.575	2.303	10.644	12.114
1.54	0.473	0.628	3.133	3.947					
0.796	0.671	2.783	0.488	2.632					

(c) P. M. Shankar



Confusion Matrix: Threshold (intersection) = 4

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	1	39
	Target Present	18	12
	Total Counts	19	51

dist to top left corner of the ROC curve = 0.401

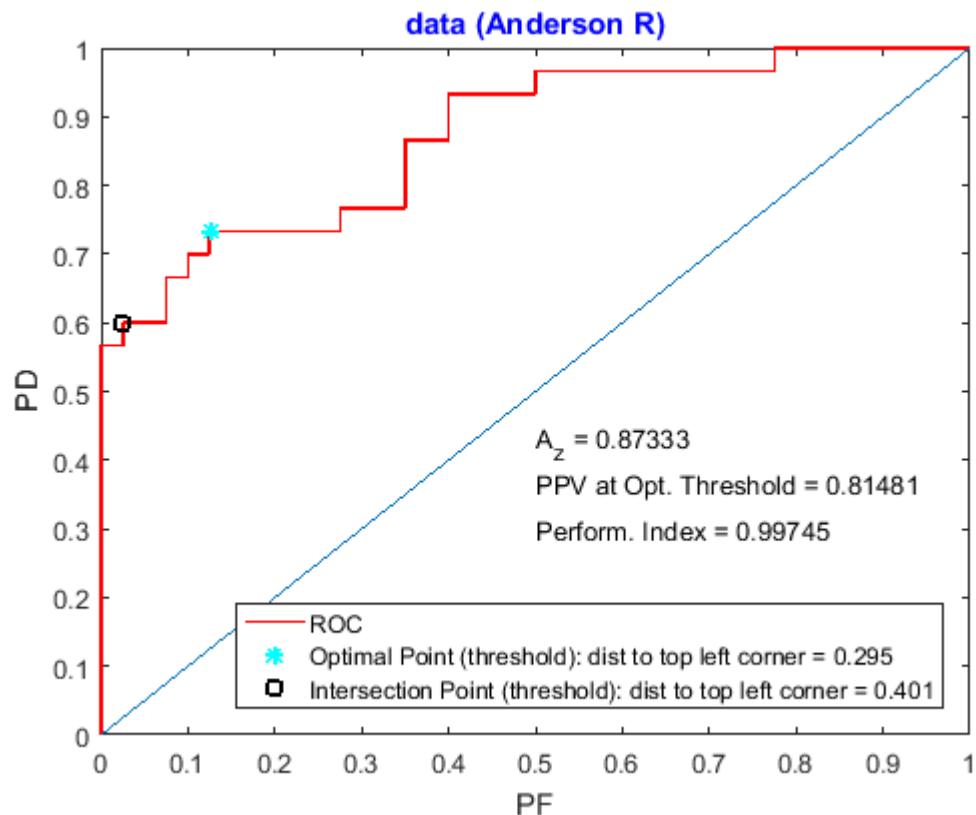
Transition Matrix: Threshold (intersection) = 4

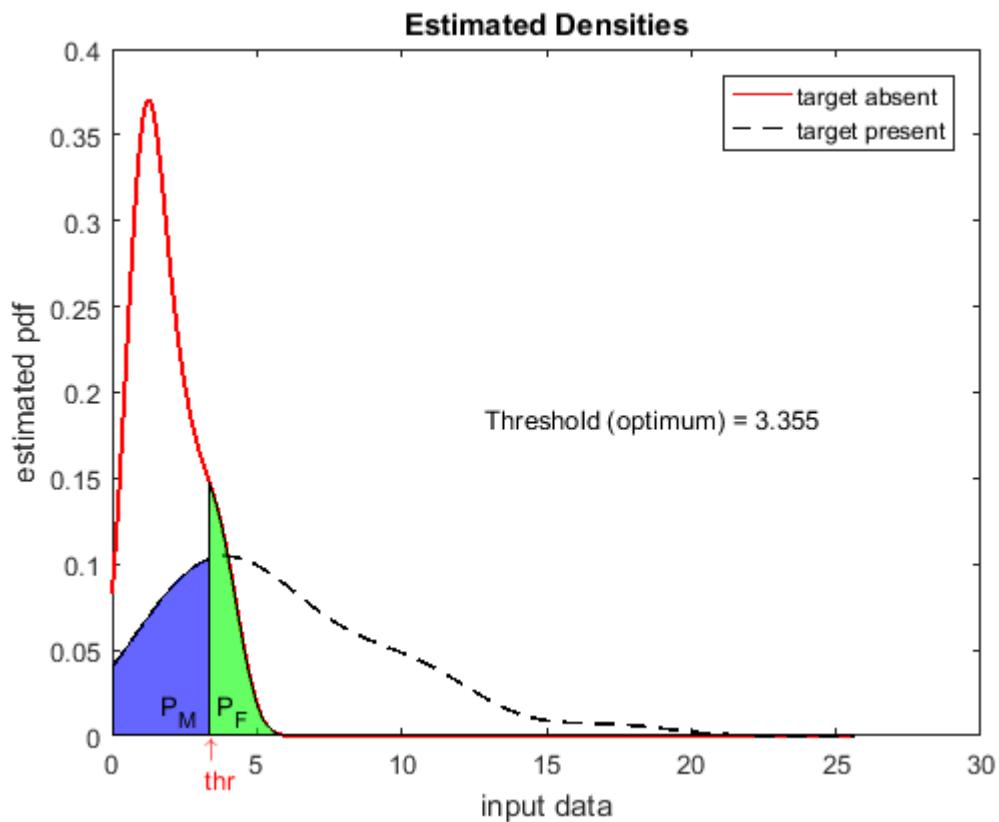
$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{39}{40} & \frac{2}{5} \\ \frac{1}{40} & \frac{3}{5} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.975 & 0.4 \\ 0.025 & 0.6 \end{bmatrix}$$

$$P_F = \frac{1}{40} = 0.025 \quad P_M = \frac{2}{5} = 0.4 \quad \text{PPV} = \frac{18}{19} = 0.94737$$

p m shankar





Confusion Matrix : Threshold (optimum) = 3.355

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	5	35
	Target Present	22	8
	Total Counts	27	43

dist to top left corner of the ROC curve = 0.295

Transition Matrix: Threshold (optimum) = 3.355

$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{7}{8} & \frac{4}{15} \\ \frac{1}{8} & \frac{11}{15} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.875 & 0.2667 \\ 0.125 & 0.7333 \end{bmatrix}$$

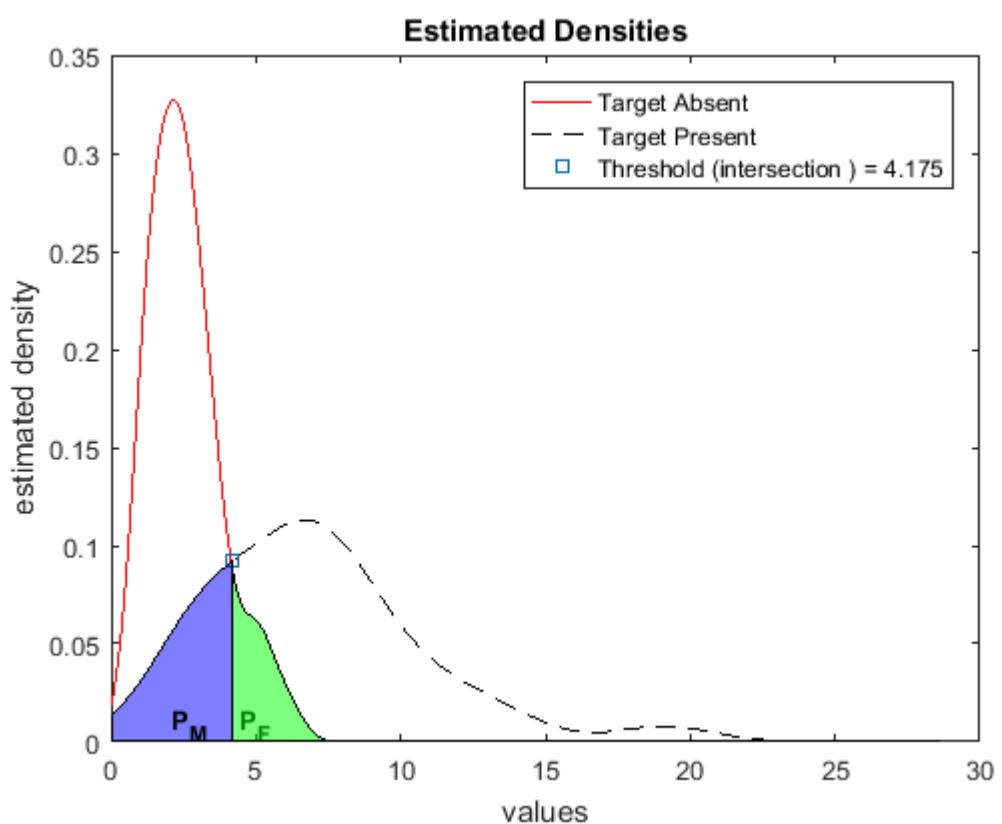
$$P_F = \frac{1}{8} = 0.125 \quad P_M = \frac{4}{15} = 0.26667 \quad \text{PPV} = \frac{22}{27} = 0.81481$$

p m shankar

data (Anderson W)

Target Absent					Target Present				
2.072	2.737	2.424	2.592	1.651	4.532	9.111	6.79	7.069	2.612
1.332	2.248	1.326	2.703	3.119	3.293	7.354	3.265	7.735	5.366
1.202	2.342	1.33	2.045	4.958	6.052	2.905	11.414	9.623	6.84
2.489	1.944	3.482	5.218	2.418	3.438	6.014	13.792	19.129	8.664
2.228	1.774	3.503	1.384	3.912	10.355	6.835	4.934	5.191	12.418
1.063	3.235	1.678	1.401	3.159	7.573	7.217	3.213	8.487	1.767
2.426	4.916	3.347	2.601	1.679					
1.049	6.069	3.968	0.932	3.011					

(c) P. M. Shankar



Confusion Matrix: Threshold (intersection) = 4.175

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	4	36
	Target Present	23	7
	Total Counts	27	43

dist to top left corner of the ROC curve = 0.254

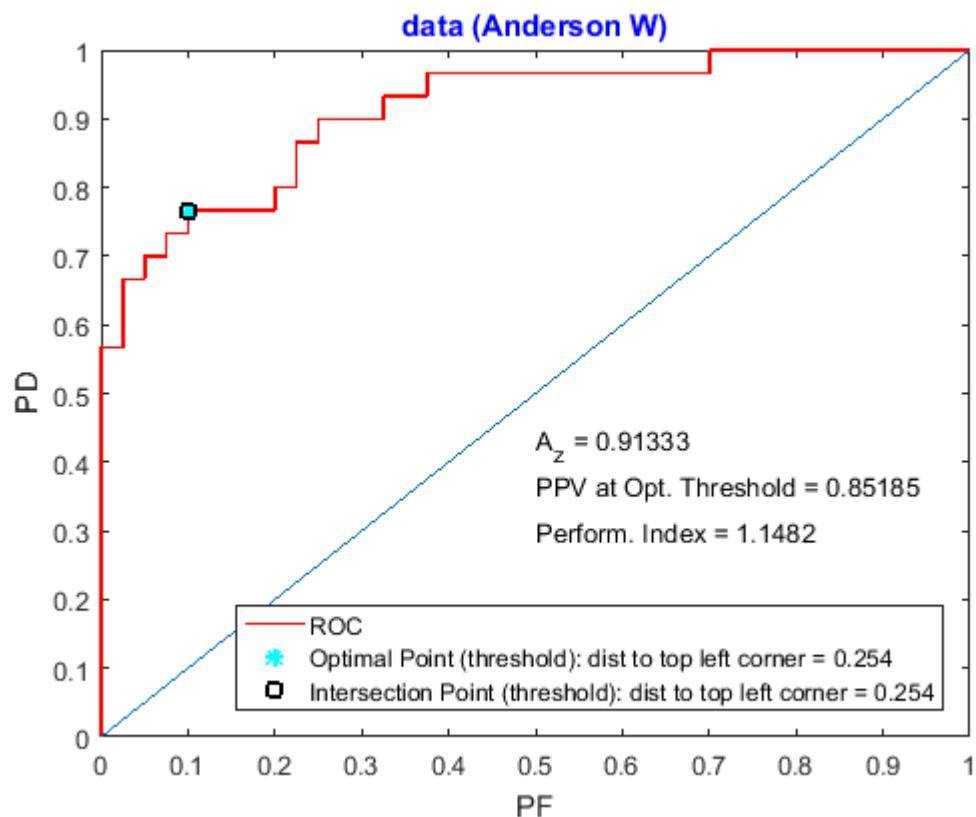
Transition Matrix: Threshold (intersection) = 4.175

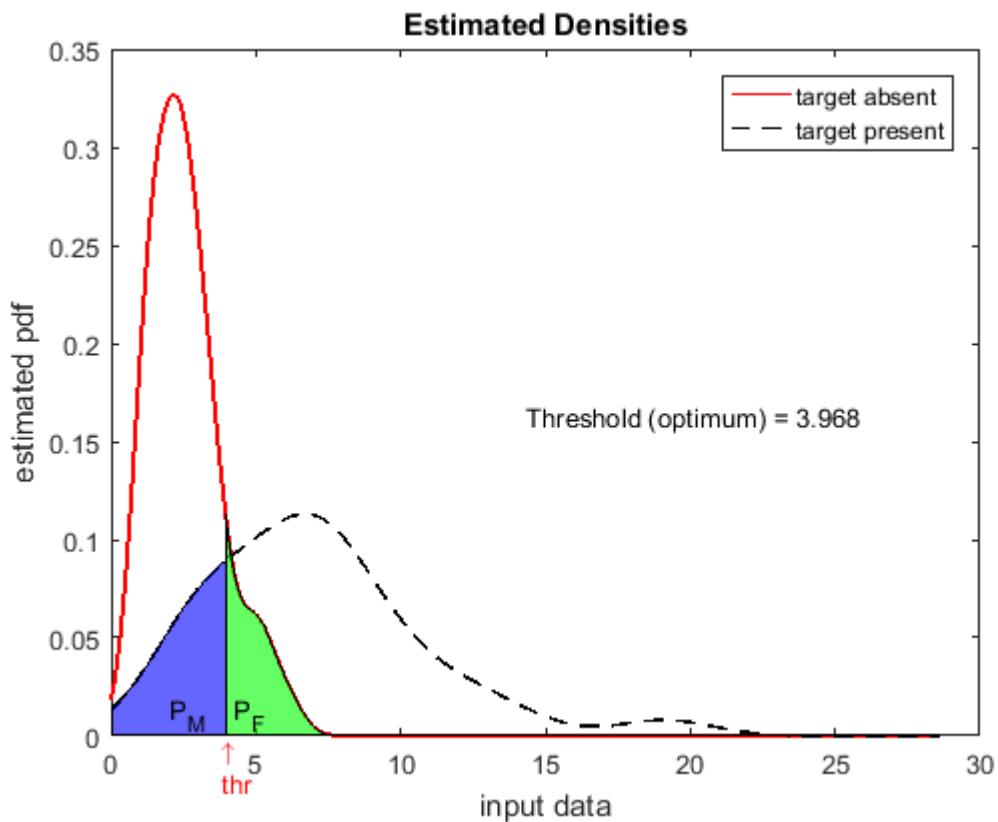
$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{9}{10} & \frac{7}{30} \\ \frac{1}{10} & \frac{23}{30} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.9 & 0.2333 \\ 0.1 & 0.7667 \end{bmatrix}$$

$$P_F = \frac{1}{10} = 0.1 \quad P_M = \frac{7}{30} = 0.2333 \quad \text{PPV} = \frac{23}{27} = 0.85185$$

p m shankar





Confusion Matrix : Threshold (optimum) = 3.968

	Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	4	36	40
	Target Present	23	7	30
	Total Counts	27	43	70

dist to top left corner of the ROC curve = 0.254

Transition Matrix: Threshold (optimum) = 3.968

$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{9}{10} & \frac{7}{30} \\ \frac{1}{10} & \frac{23}{30} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.9 & 0.2333 \\ 0.1 & 0.7667 \end{bmatrix}$$

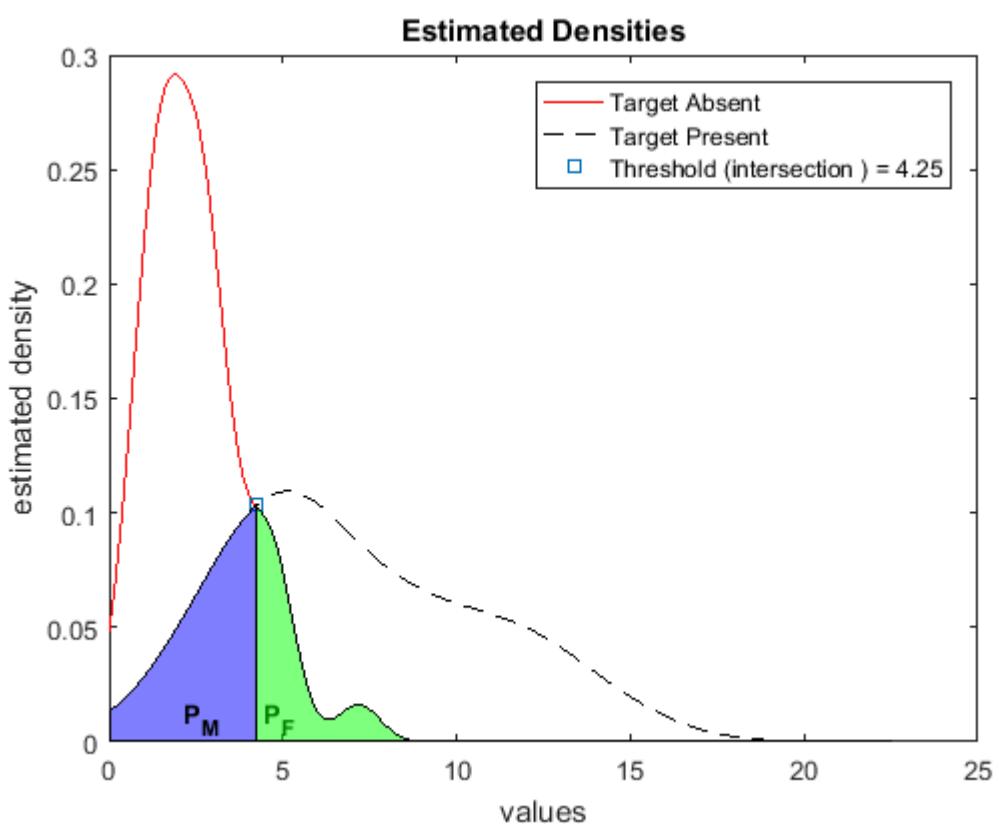
$$P_F = \frac{1}{10} = 0.1 \quad P_M = \frac{7}{30} = 0.2333 \quad \text{PPV} = \frac{23}{27} = 0.85185$$

p m shankar

data (Andiario)

Target Absent					Target Present				
2.835	2.594	2.209	1.808	2.413	12.193	4.676	5.509	2.609	12.651
2.815	1.135	7.178	1.099	3.097	9.876	4.038	15.022	13.122	2.088
2.169	2.052	2.131	1.295	1.461	8.835	4.099	8.483	5.743	5.451
4.259	2.655	2.648	1.652	1.619	4.833	11.098	7.374	10.514	5.016
4.747	1.579	2.976	4.225	3.225	11.774	5.966	2.381	8.536	4.677
1.619	0.963	4.445	5.045	2.422	5.676	3.688	4.403	8.243	6.572
1.174	1.031	0.422	0.57	4.819					
3.073	1.418	2.752	3.562	1.46					

(c) P. M. Shankar



Confusion Matrix: Threshold (intersection) = 4.25

Data Collected	Target Detected	Target Not Detected	Total Counts
Target Absent	6	34	40
Target Present	24	6	30
Total Counts	30	40	70

dist to top left corner of the ROC curve = 0.25

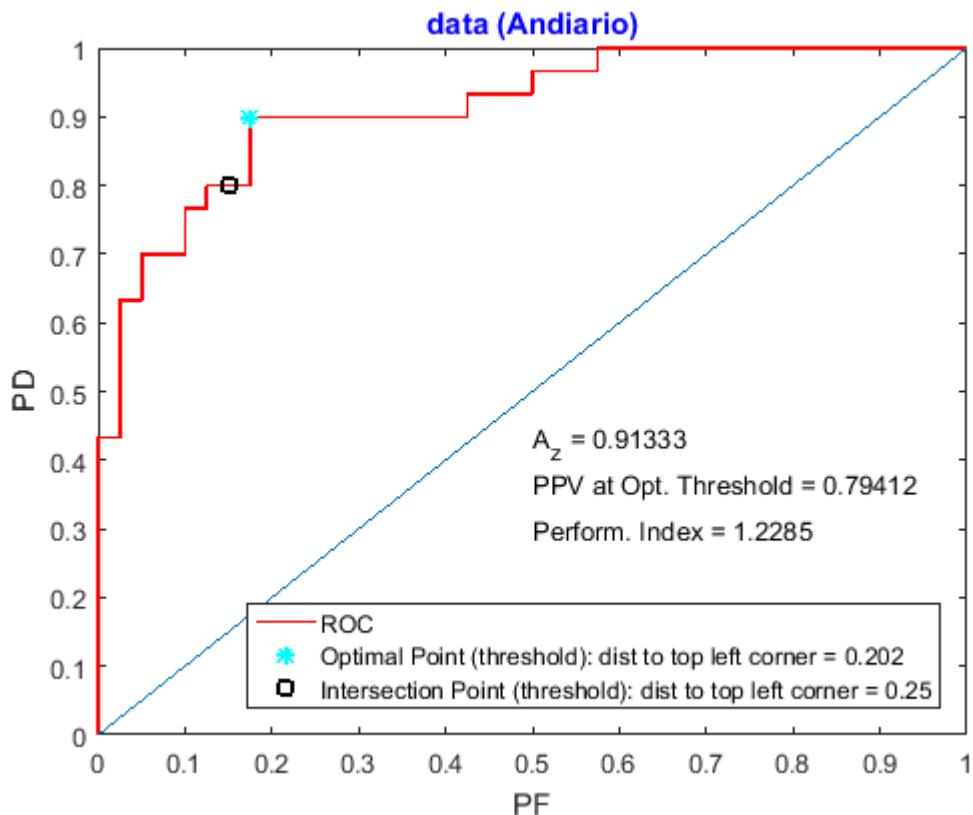
Transition Matrix: Threshold (intersection) = 4.25

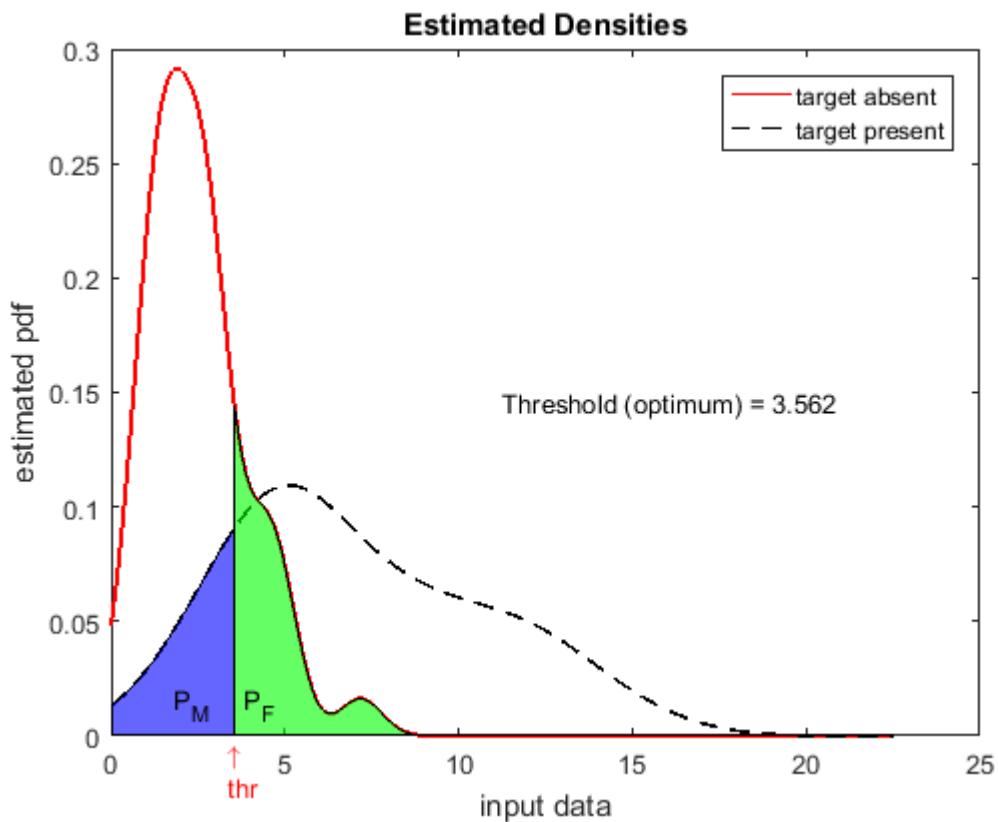
$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{17}{20} & \frac{1}{5} \\ \frac{3}{20} & \frac{4}{5} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.85 & 0.2 \\ 0.15 & 0.8 \end{bmatrix}$$

$$P_F = \frac{3}{20} = 0.15 \quad P_M = \frac{1}{5} = 0.2 \quad \text{PPV} = \frac{4}{5} = 0.8$$

p m shankar





Confusion Matrix : Threshold (optimum) = 3.562

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	7	33
	Target Present	27	3
	Total Counts	34	36

dist to top left corner of the ROC curve = 0.202

Transition Matrix: Threshold (optimum) = 3.562

$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{33}{40} & \frac{1}{10} \\ \frac{7}{40} & \frac{9}{10} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.825 & 0.1 \\ 0.175 & 0.9 \end{bmatrix}$$

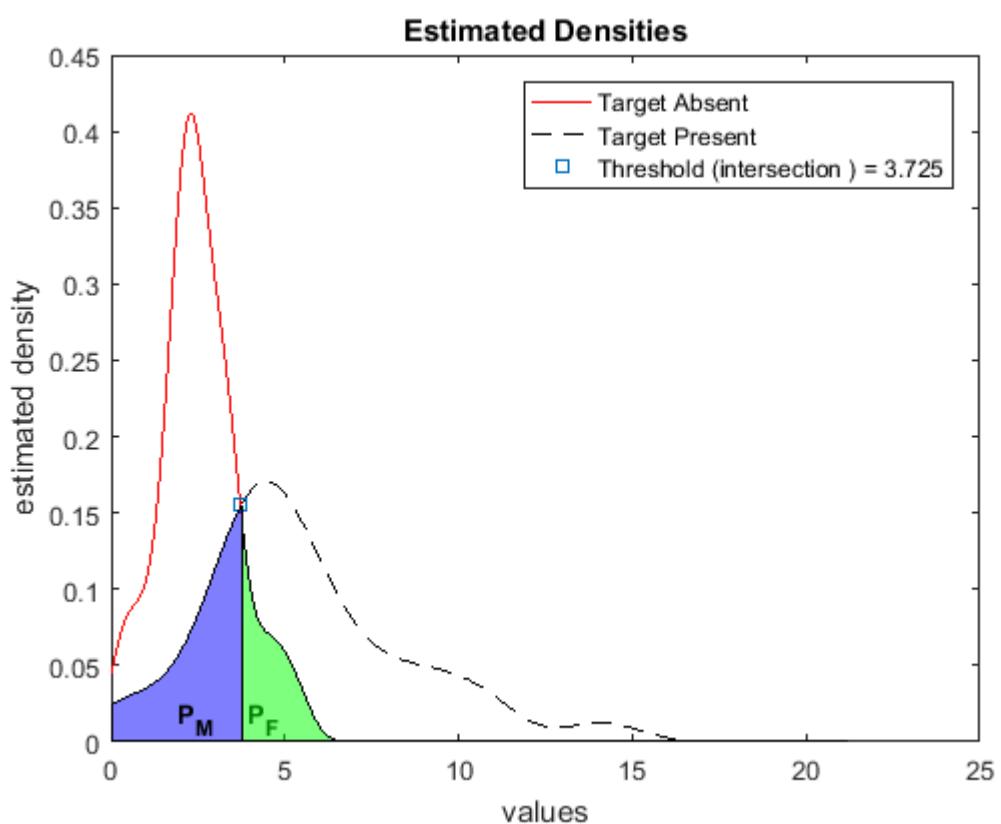
$$P_F = \frac{7}{40} = 0.175 \quad P_M = \frac{1}{10} = 0.1 \quad \text{PPV} = \frac{27}{34} = 0.79412$$

p m shankar

data (Balaji)

Target Absent					Target Present				
2.404	2.989	0.517	3.72	0.343	4.599	4.208	7.294	7.275	4.817
1.956	1.99	1.259	3.18	2.495	2.374	2.852	6.07	9.514	6.264
3.503	2.526	2.195	4.365	1.05	3.364	5.645	4.011	3.683	6.068
2.969	1.814	2.759	2.245	2.291	0.359	0.609	3.047	5.496	4.52
1.726	4.934	3.445	2.398	3.312	14.136	4.968	8.519	10.889	4.804
2.491	3.391	0.417	4.533	1.886	4.124	10.467	4.463	3.712	8.77
2.439	1.517	3.296	5.389	3.061					
2.048	2.06	2.114	2.209	2.577					

(c) P. M. Shankar



Confusion Matrix: Threshold (intersection) = 3.725

Data Collected	Target Detected	Target Not Detected	Total Counts
Target Absent	4	36	40
Target Present	22	8	30
Total Counts	26	44	70

Errors circled

dist to top left corner of the ROC curve = 0.285

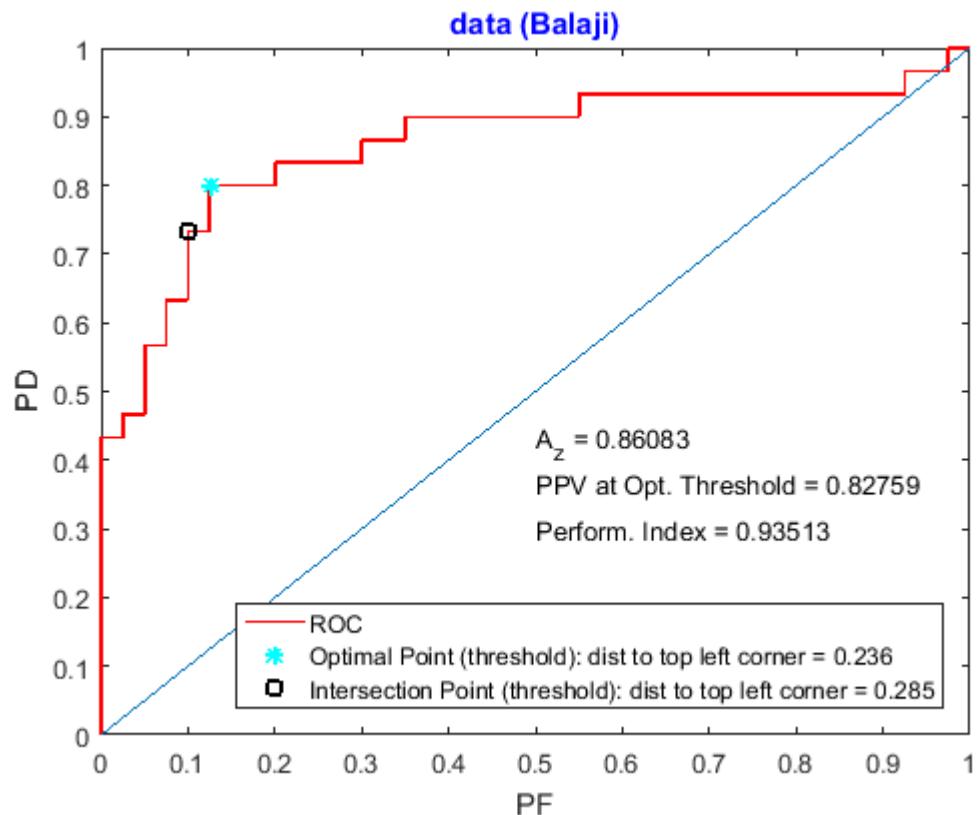
Transition Matrix: Threshold (intersection) = 3.725

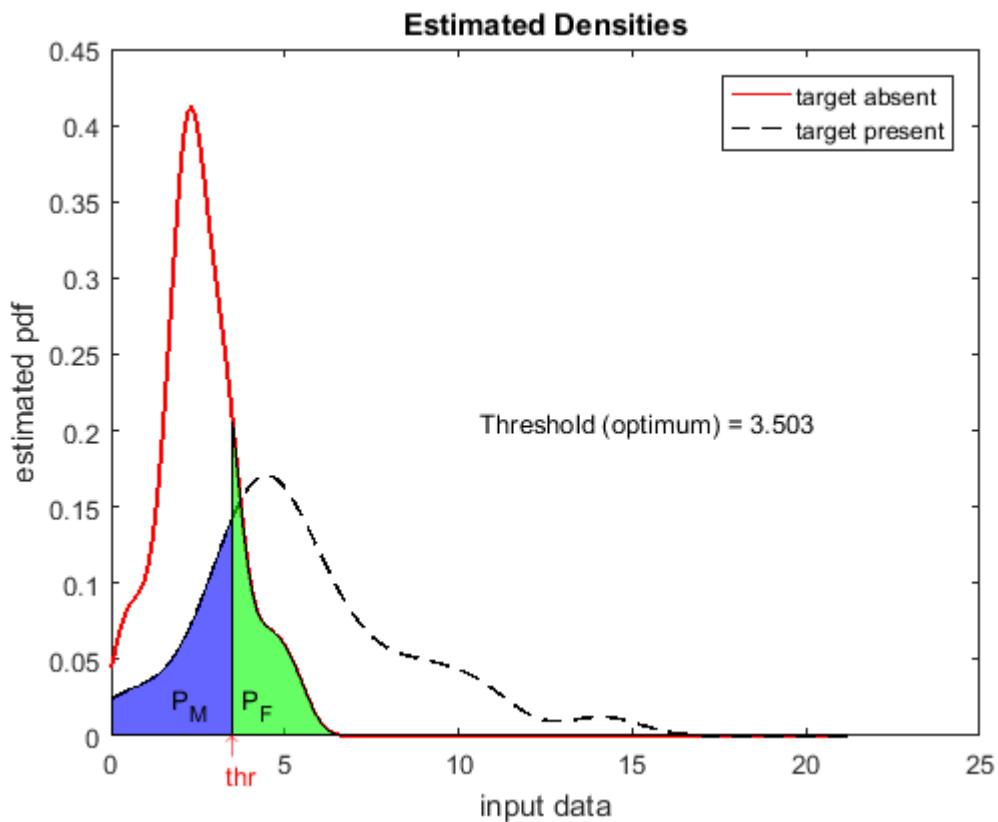
$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{9}{10} & \frac{4}{15} \\ \frac{1}{10} & \frac{11}{15} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.9 & 0.26667 \\ 0.1 & 0.7333 \end{bmatrix}$$

$$P_F = \frac{1}{10} = 0.1 \quad P_M = \frac{4}{15} = 0.26667 \quad \text{PPV} = \frac{11}{13} = 0.84615$$

p m shankar





Confusion Matrix : Threshold (optimum) = 3.503

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	5	35
	Target Present	24	6
	Total Counts	29	41

dist to top left corner of the ROC curve = 0.236

Transition Matrix: Threshold (optimum) = 3.503

$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{7}{8} & \frac{1}{5} \\ \frac{1}{8} & \frac{4}{5} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.875 & 0.2 \\ 0.125 & 0.8 \end{bmatrix}$$

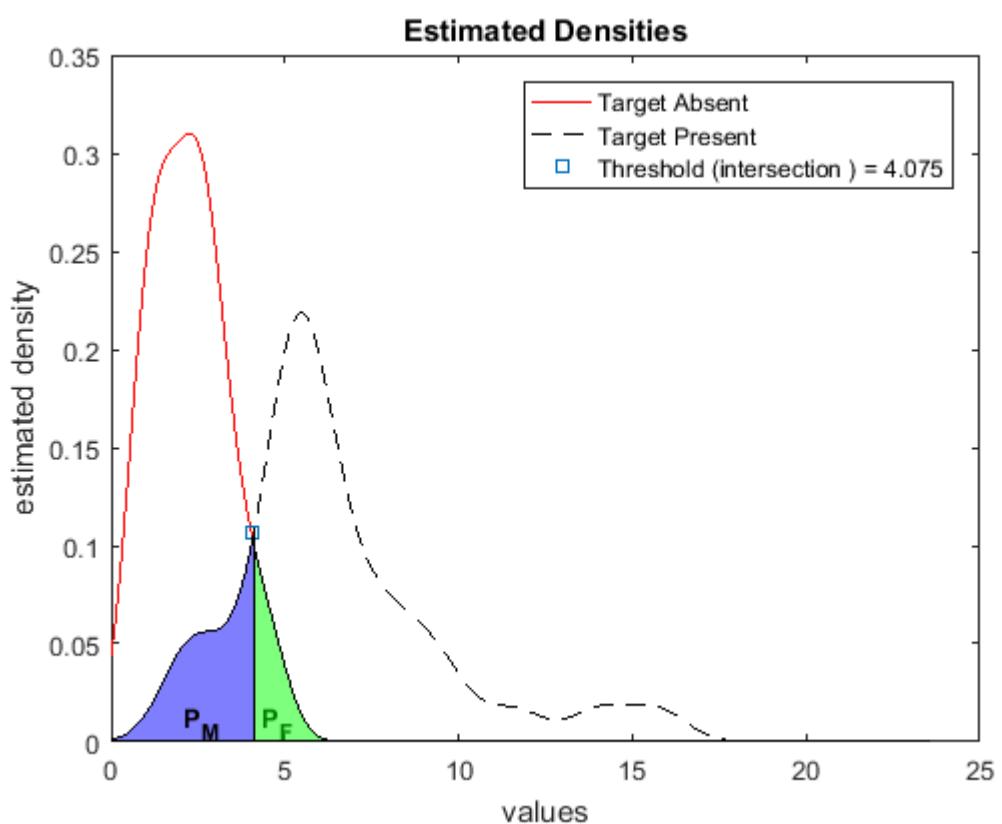
$$P_F = \frac{1}{8} = 0.125 \quad P_M = \frac{1}{5} = 0.2 \quad \text{PPV} = \frac{24}{29} = 0.82759$$

p m shankar

data (Basu)

Target Absent					Target Present				
2.723	1.516	0.834	2.265	3.348	7.788	2.112	4.581	11.624	2.295
0.83	0.902	0.784	2.996	1.406	14.023	9.669	5.595	5.372	15.724
1.369	3.152	2.938	2.303	1.583	5.293	8.12	4.295	8.625	5.246
4.506	2.118	1.687	3.736	4.814	5.754	6.544	6.477	7.439	5.142
1.041	1.422	0.803	1.595	3.933	5.13	5.748	6.02	5.497	2.502
2.812	2.77	2.623	2.686	2.525	6.666	9.378	5.478	3.627	4.915
1.022	3.407	2.36	0.962	4.113					
1.716	2.639	1.862	2.299	2.078					

(c) P. M. Shankar



Confusion Matrix: Threshold (intersection) = 4.075

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	3	37
	Target Present	26	4
	Total Counts	29	41

dist to top left corner of the ROC curve = 0.153

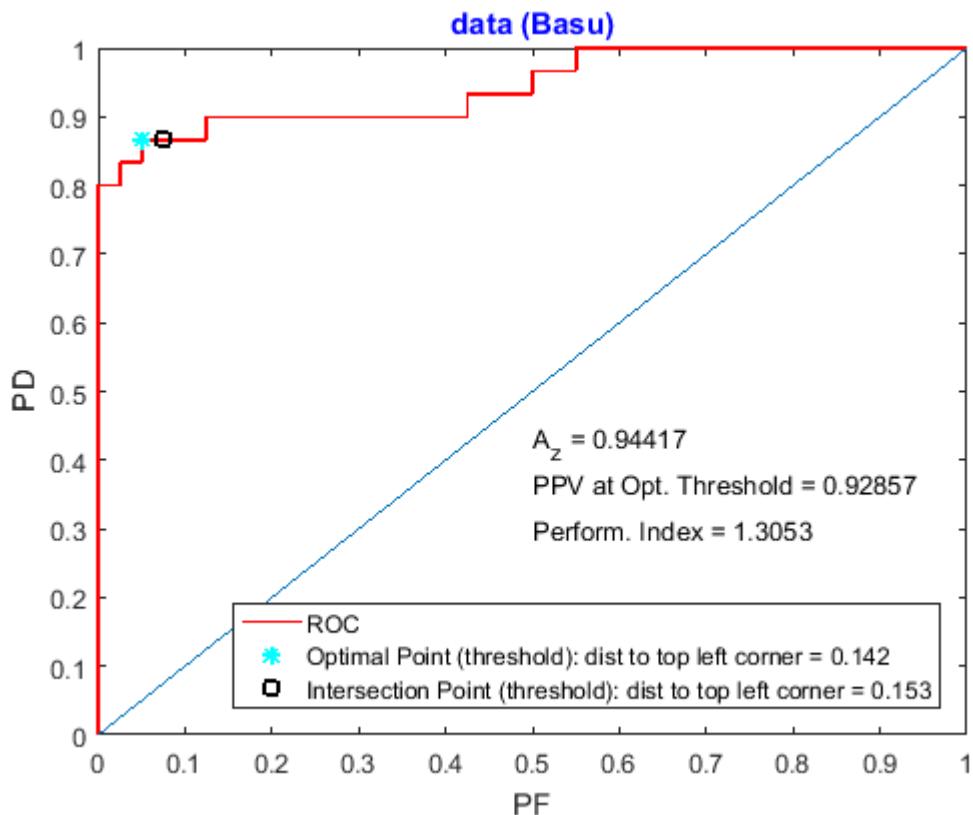
Transition Matrix: Threshold (intersection) = 4.075

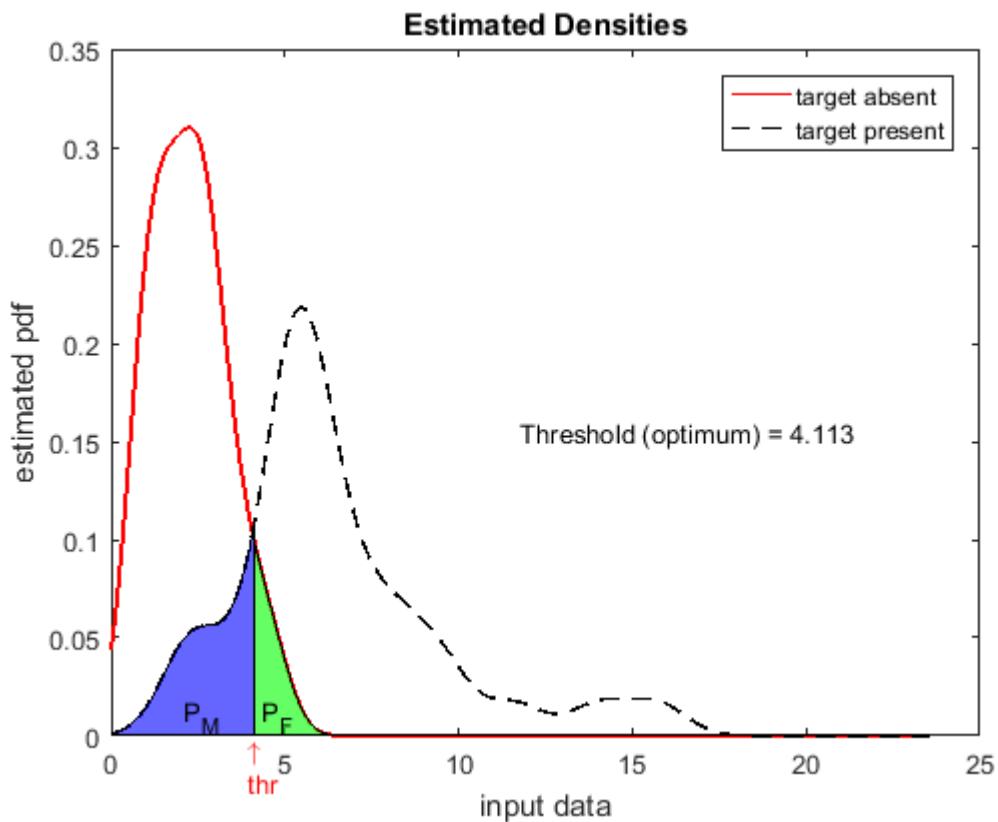
$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{37}{40} & \frac{2}{15} \\ \frac{3}{40} & \frac{13}{15} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.925 & 0.1333 \\ 0.075 & 0.8667 \end{bmatrix}$$

$$P_F = \frac{3}{40} = 0.075 \quad P_M = \frac{2}{15} = 0.13333 \quad \text{PPV} = \frac{26}{29} = 0.89655$$

p m shankar





Confusion Matrix : Threshold (optimum) = 4.113

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	2	38
	Target Present	26	4
	Total Counts	28	42

dist to top left corner of the ROC curve = 0.142

Transition Matrix: Threshold (optimum) = 4.113

$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{19}{20} & \frac{2}{15} \\ \frac{1}{20} & \frac{13}{15} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.95 & 0.1333 \\ 0.05 & 0.8667 \end{bmatrix}$$

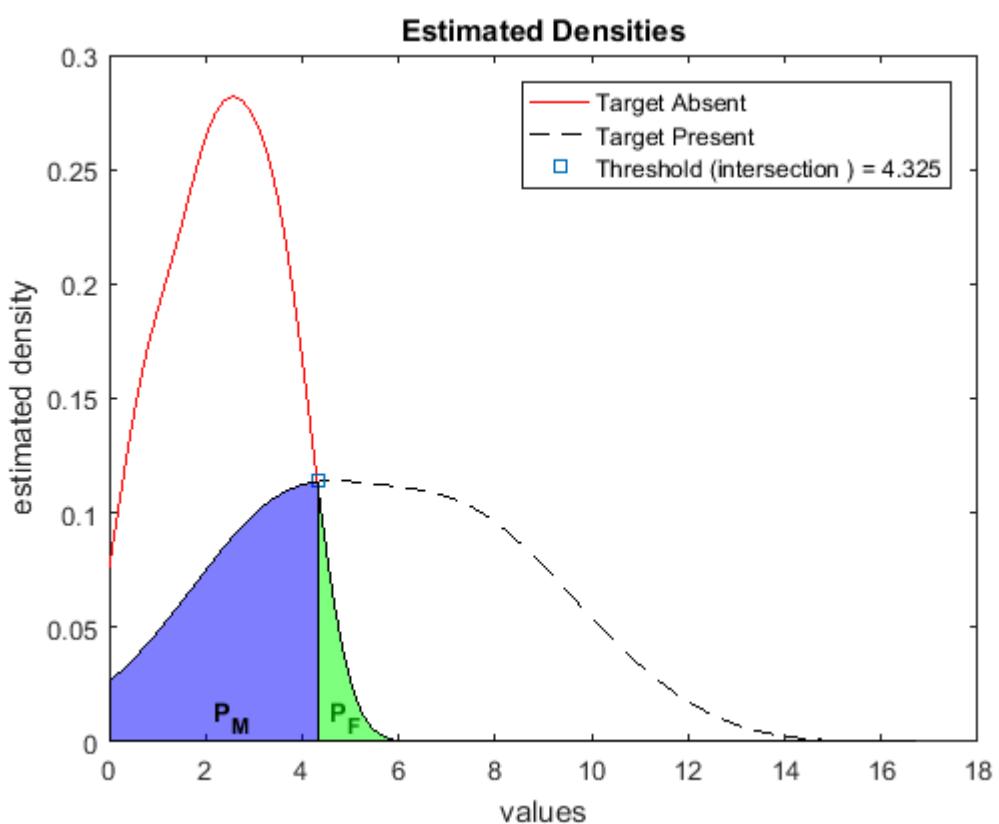
$$P_F = \frac{1}{20} = 0.05 \quad P_M = \frac{2}{15} = 0.1333 \quad \text{PPV} = \frac{13}{14} = 0.92857$$

p m shankar

data (Buccieri)

Target Absent					Target Present				
1.615	1.994	1.159	3.023	2.558	2.674	1.282	7.247	3.716	4.879
4.051	1.723	3.052	1.485	4.034	6.962	9.24	9.232	2.199	4.021
2.147	2.575	2.103	3.827	2.774	10.068	4.489	7.647	3.571	7.824
0.776	1.908	0.597	3.672	3.067	4.083	6.216	4.495	3.253	4.821
3.602	0.514	3.173	0.86	4.058	6.281	11.15	6.859	3.031	7.135
1.965	2.93	0.526	2.177	0.639	0.378	6.379	8.046	2.8	8.874
3.452	1.863	3.365	3.839	0.473					
2.468	2.263	3.295	1.193	2.593					

(c) P. M. Shankar



Confusion Matrix: Threshold (intersection) = 4.325

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	0	40
	Target Present	19	11
	Total Counts	19	51

dist to top left corner of the ROC curve = 0.367

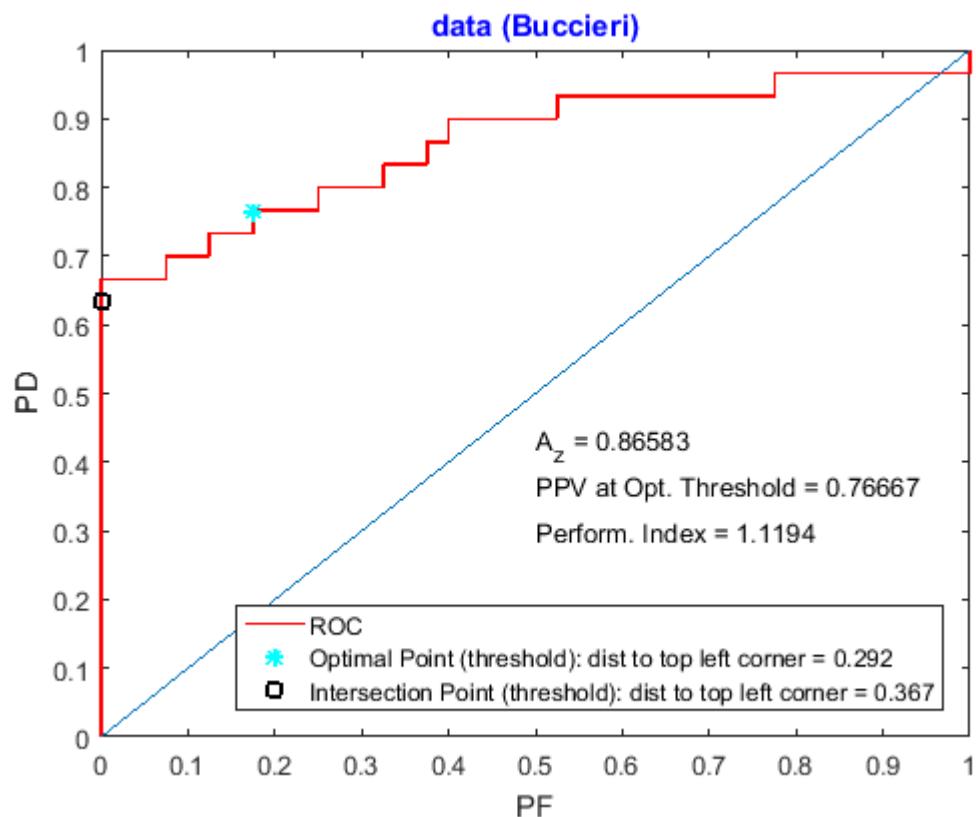
Transition Matrix: Threshold (intersection) = 4.325

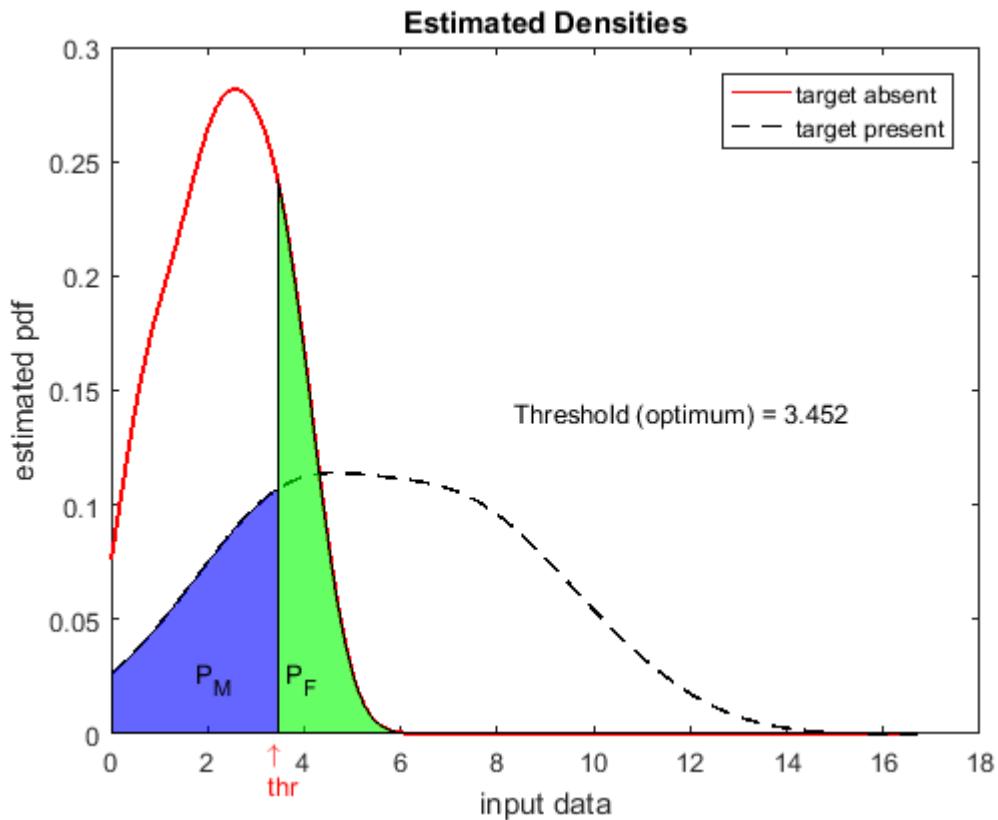
$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} 1 & \frac{11}{30} \\ 0 & \frac{19}{30} \end{bmatrix} \Rightarrow \begin{bmatrix} 1 & 0.36667 \\ 0 & 0.6333 \end{bmatrix}$$

$$P_F = 0 = 0 \quad P_M = \frac{11}{30} = 0.36667 \quad \text{PPV} = 1 = 1$$

p m shankar





Confusion Matrix : Threshold (optimum) = 3.452

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	7	33
	Target Present	23	7
	Total Counts	30	40

dist to top left corner of the ROC curve = 0.292

Transition Matrix: Threshold (optimum) = 3.452

$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{33}{40} & \frac{7}{30} \\ \frac{7}{40} & \frac{23}{30} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.825 & 0.2333 \\ 0.175 & 0.7667 \end{bmatrix}$$

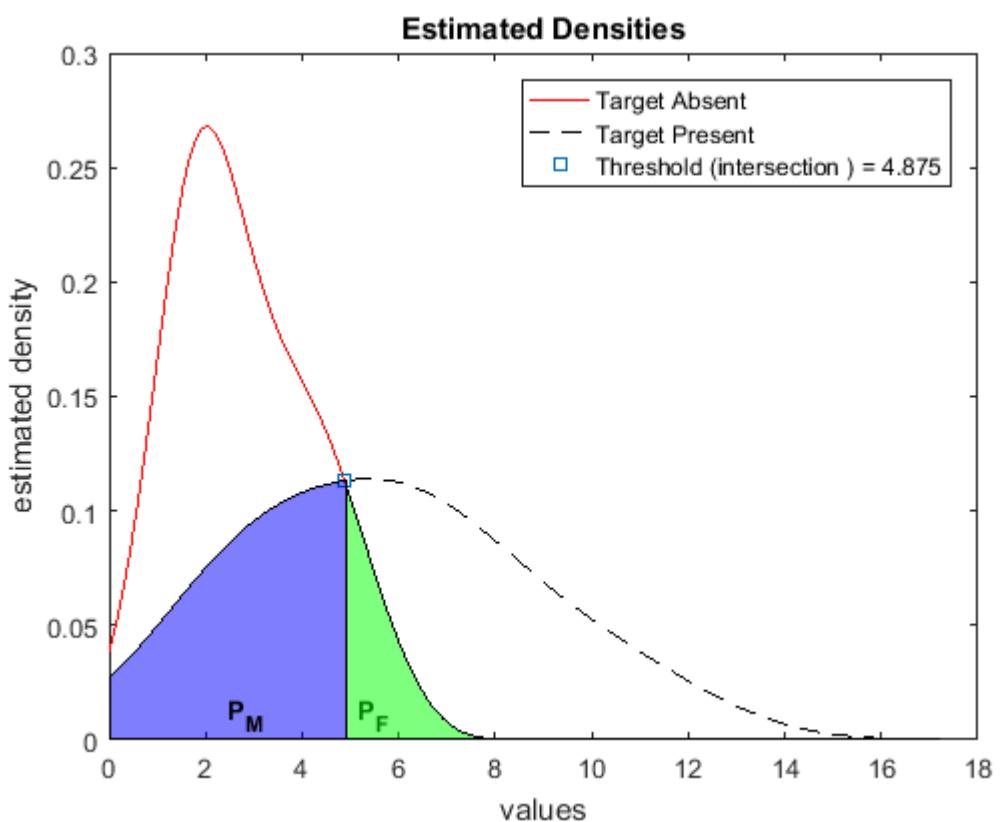
$$P_F = \frac{7}{40} = 0.175 \quad P_M = \frac{7}{30} = 0.2333 \quad \text{PPV} = \frac{23}{30} = 0.76667$$

p m shankar

data (Burke)

Target Absent					Target Present				
4.069	1.392	6.061	0.491	4.033	6.996	5.478	8.359	3.128	6.498
1.89	1.703	3.581	2.334	3.522	6.327	2.369	1.121	7.041	3.748
1.6	2.993	4.644	2.889	4.085	2.172	8.798	6.732	5.133	3.095
1.704	3.296	1.155	0.662	1.379	6.179	3.749	3.914	2.941	2.321
4.695	2.387	2.549	1.724	1.157	2.673	6.031	10.332	11.34	8.803
1.468	3.884	4.333	2.811	3.043	9.14	4.998	6.653	11.479	5.701
2.018	2.711	2.306	1.92	2.037					
5.428	1.681	5.125	5.03	2.272					

(c) P. M. Shankar



Confusion Matrix: Threshold (intersection) = 4.875

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	4	36
	Target Present	19	11
	Total Counts	23	47

dist to top left corner of the ROC curve = 0.38

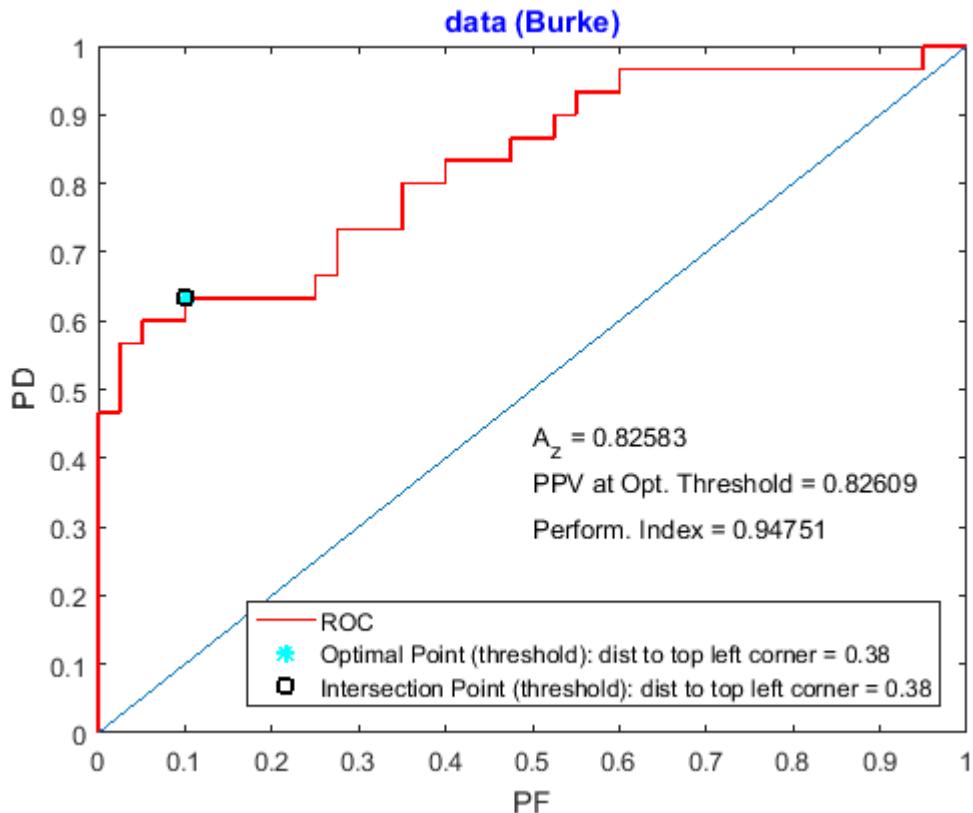
Transition Matrix: Threshold (intersection) = 4.875

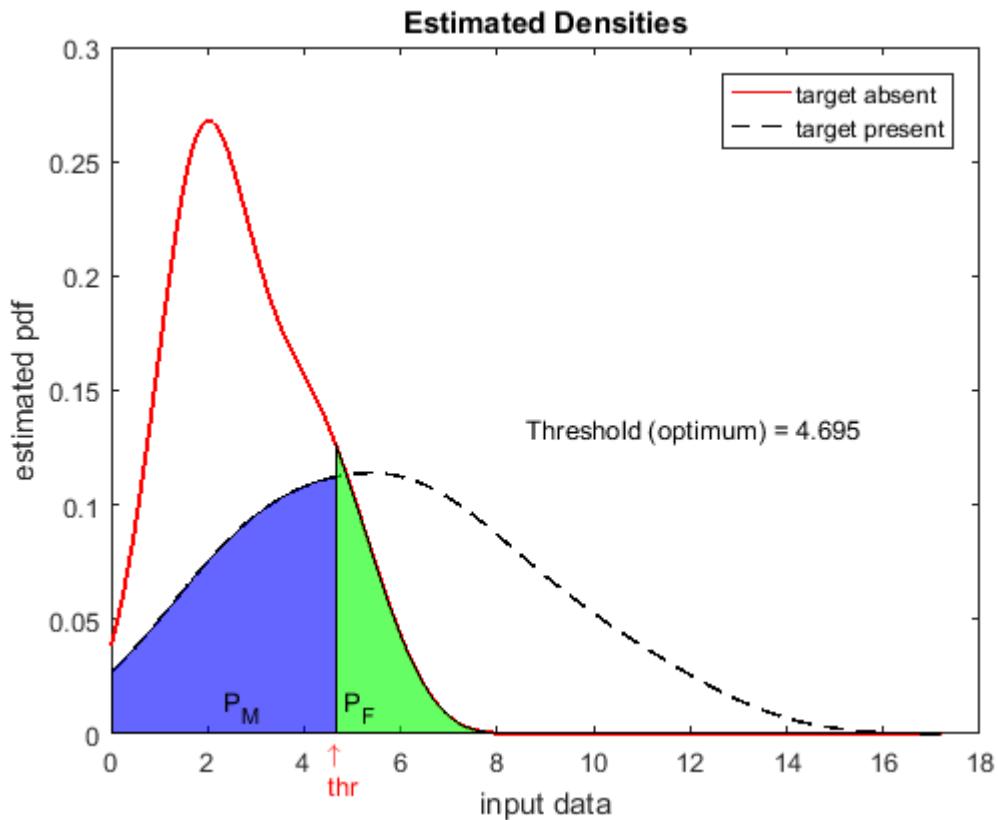
$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{9}{10} & \frac{11}{30} \\ \frac{1}{10} & \frac{19}{30} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.9 & 0.36667 \\ 0.1 & 0.6333 \end{bmatrix}$$

$$P_F = \frac{1}{10} = 0.1 \quad P_M = \frac{11}{30} = 0.36667 \quad \text{PPV} = \frac{19}{23} = 0.82609$$

p m shankar





Confusion Matrix : Threshold (optimum) = 4.695

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	4	36
	Target Present	19	11
	Total Counts	23	47

dist to top left corner of the ROC curve = 0.38

Transition Matrix: Threshold (optimum) = 4.695

$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{9}{10} & \frac{11}{30} \\ \frac{1}{10} & \frac{19}{30} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.9 & 0.3667 \\ 0.1 & 0.6333 \end{bmatrix}$$

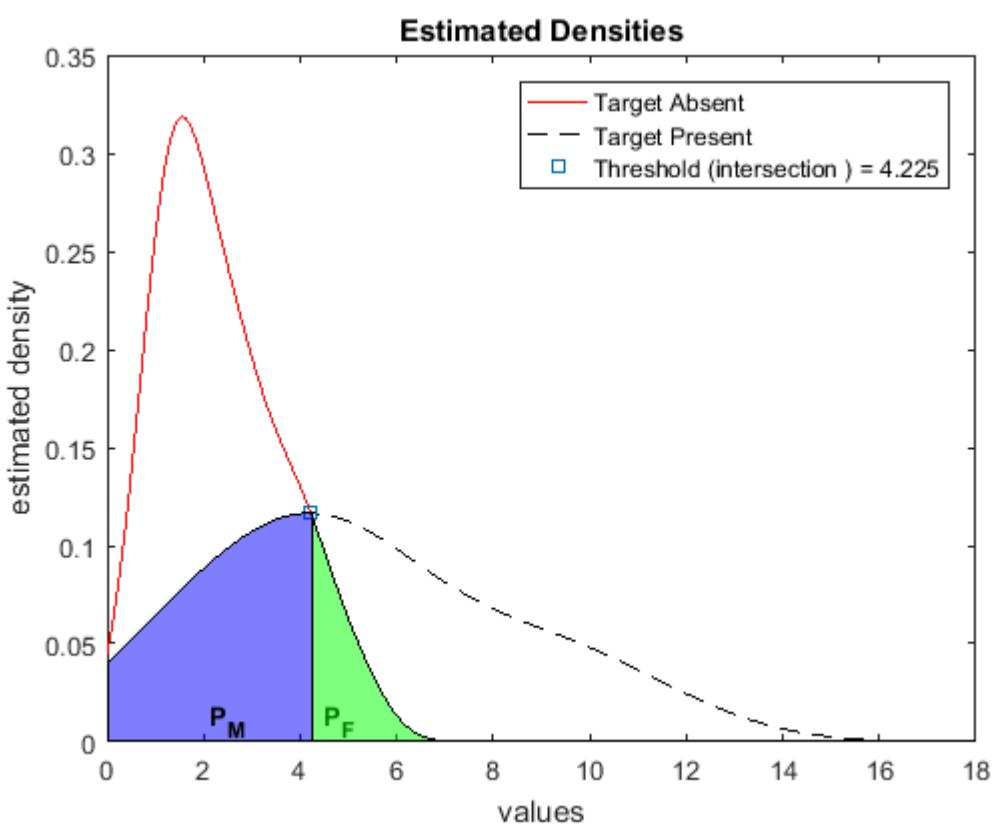
$$P_F = \frac{1}{10} = 0.1 \quad P_M = \frac{11}{30} = 0.36667 \quad \text{PPV} = \frac{19}{23} = 0.82609$$

p m shankar

data (Cai)

Target Absent					Target Present				
2.776	1.489	2.85	1.27	3.801	12.01	3.838	8.389	5.576	4.69
1.052	3.429	2.646	1.713	5.013	1.705	4.45	6.932	5.235	1.49
1.189	1.88	0.612	4.217	3.119	7.389	4.264	10.324	4.371	7.579
0.923	1.096	5.246	1.568	4.193	4.609	1.818	9.814	9.581	9.889
3.821	4.316	2.185	1.589	2.227	4.501	1.781	3.641	4.54	6.874
1.998	1.164	2.941	2.867	1.433	2.797	0.74	5.083	1.438	2.966
1.427	1.871	2.214	1.19	2.693					
3.832	1.208	1.195	1.317	2.374					

(c) P. M. Shankar



Confusion Matrix: Threshold (intersection) = 4.225

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	3	37
	Target Present	20	10
	Total Counts	23	47

dist to top left corner of the ROC curve = 0.342

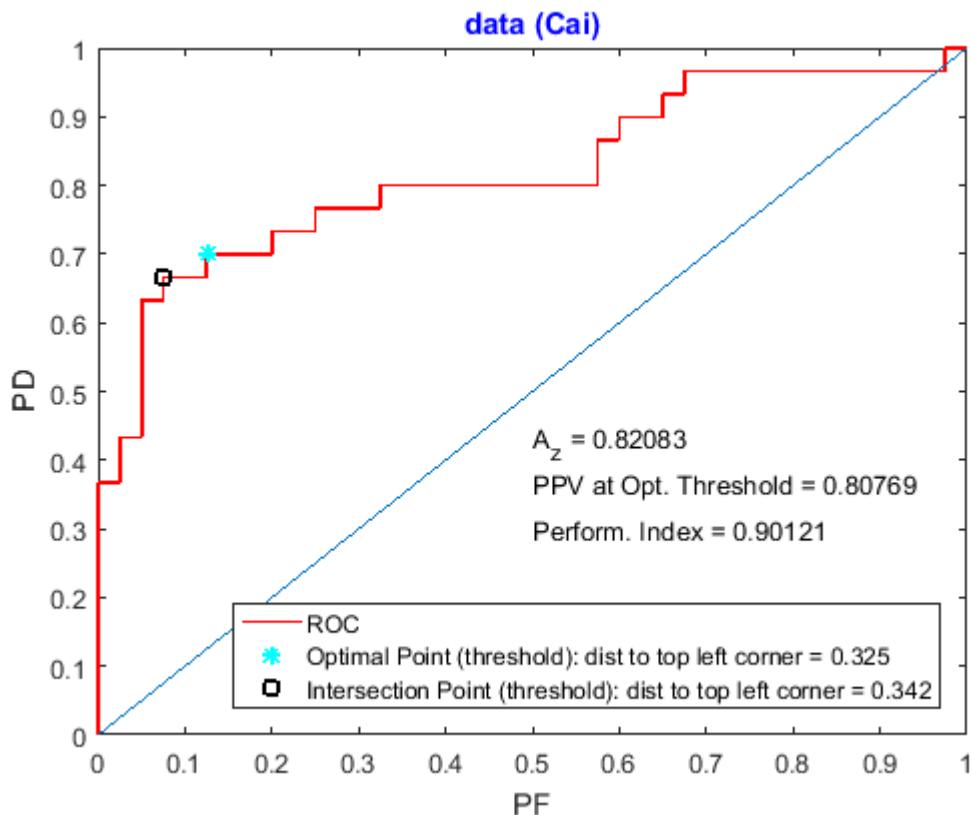
Transition Matrix: Threshold (intersection) = 4.225

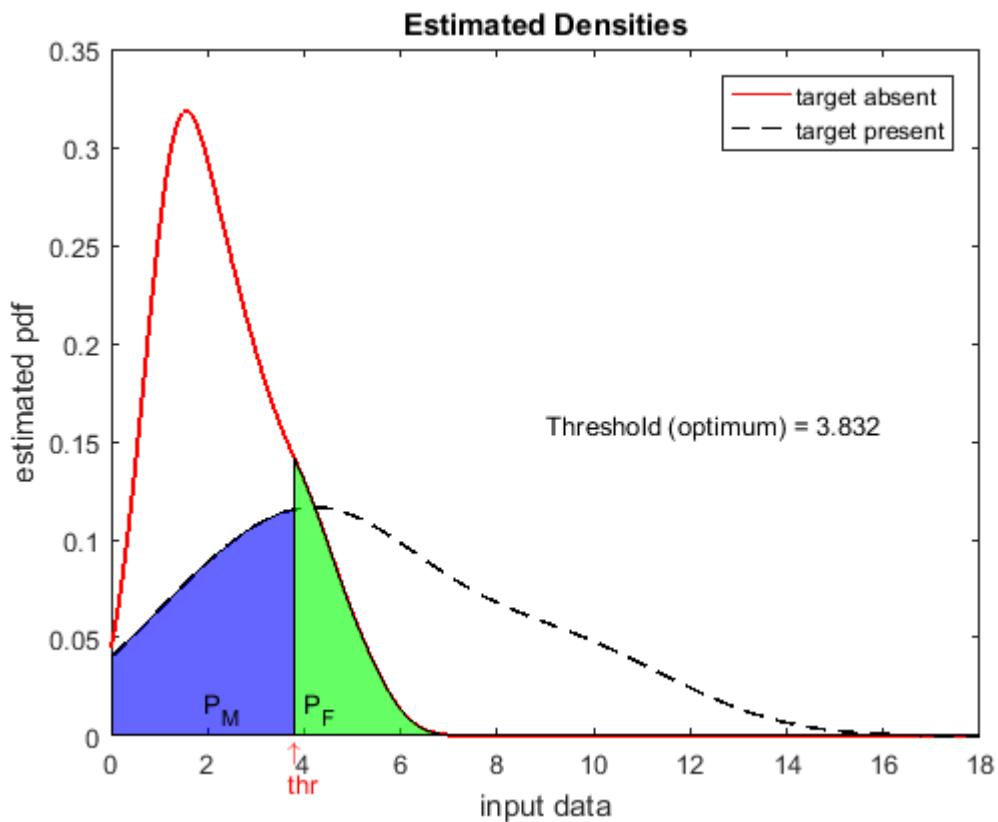
$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{37}{40} & \frac{1}{3} \\ \frac{3}{40} & \frac{2}{3} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.925 & 0.3333 \\ 0.075 & 0.6667 \end{bmatrix}$$

$$P_F = \frac{3}{40} = 0.075 \quad P_M = \frac{1}{3} = 0.33333 \quad \text{PPV} = \frac{20}{23} = 0.86957$$

p m shankar





Confusion Matrix : Threshold (optimum) = 3.832

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	5	35
	Target Present	21	9
	Total Counts	26	44

dist to top left corner of the ROC curve = 0.325

Transition Matrix: Threshold (optimum) = 3.832

$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{7}{8} & \frac{3}{10} \\ \frac{1}{8} & \frac{7}{10} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.875 & 0.3 \\ 0.125 & 0.7 \end{bmatrix}$$

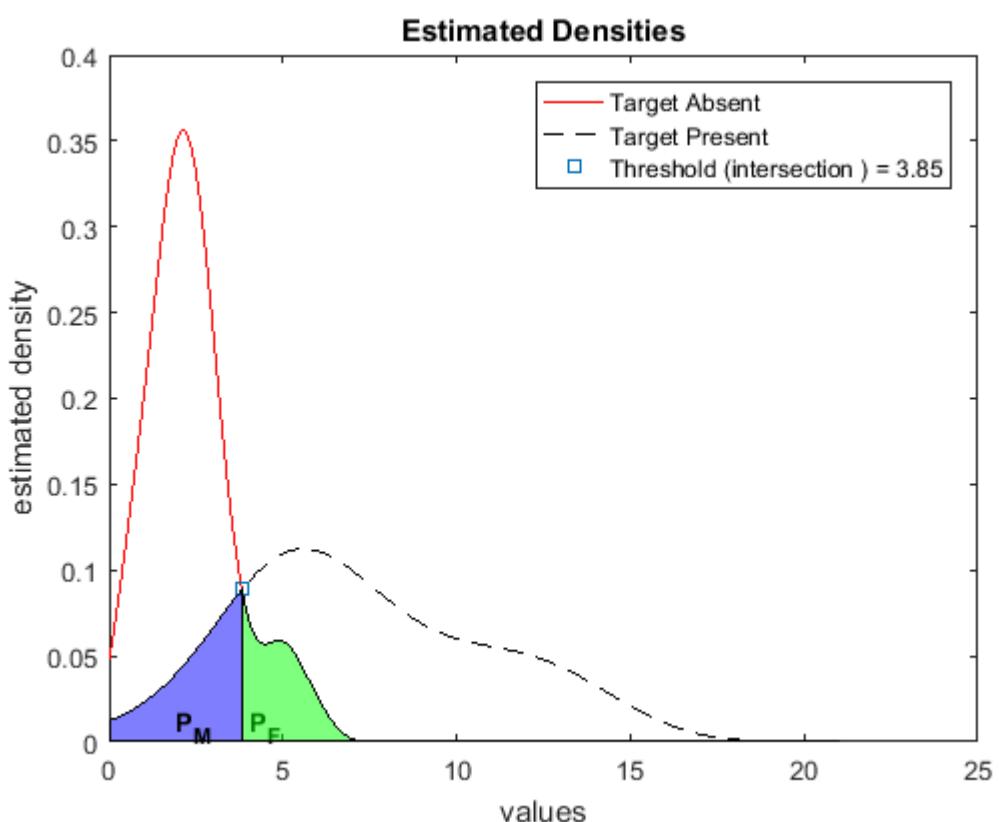
$$P_F = \frac{1}{8} = 0.125 \quad P_M = \frac{3}{10} = 0.3 \quad \text{PPV} = \frac{21}{26} = 0.80769$$

p m shankar

data (Chan)

Target Absent					Target Present				
2.589	1.988	3.572	2.609	2.851	4.98	5.419	13.903	5.563	7.124
1.198	2.913	5.118	2	1.893	5.606	3.294	3.538	11.56	7.253
1.701	1.609	0.774	2.743	2.87	3.86	12.124	7.452	9.738	5.371
2.208	2.043	3.495	3.079	2.784	0.757	14.03	7.467	5.488	5.119
1.666	2.074	5.859	0.387	1.402	6.354	9.806	4.773	11.68	4.147
2.504	2.072	0.487	1.377	4.58	7.437	10.394	3.93	12.695	8.537
2.135	1.075	1.091	0.712	2.436					
1.628	4.986	3.792	2.527	1.912					

(c) P. M. Shankar



Confusion Matrix: Threshold (intersection) = 3.85

Data Collected	Target Detected	Target Not Detected	Total Counts
Target Absent	4	36	40
Target Present	27	3	30
Total Counts	31	39	70

Errors circled

dist to top left corner of the ROC curve = 0.141

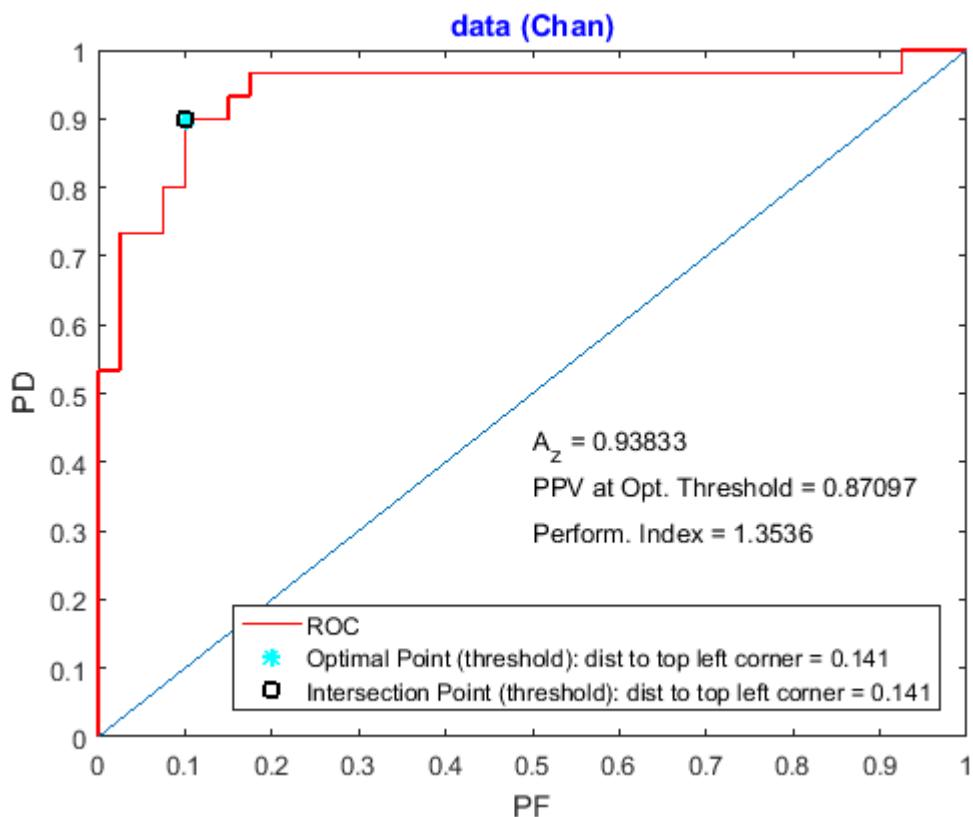
Transition Matrix: Threshold (intersection) = 3.85

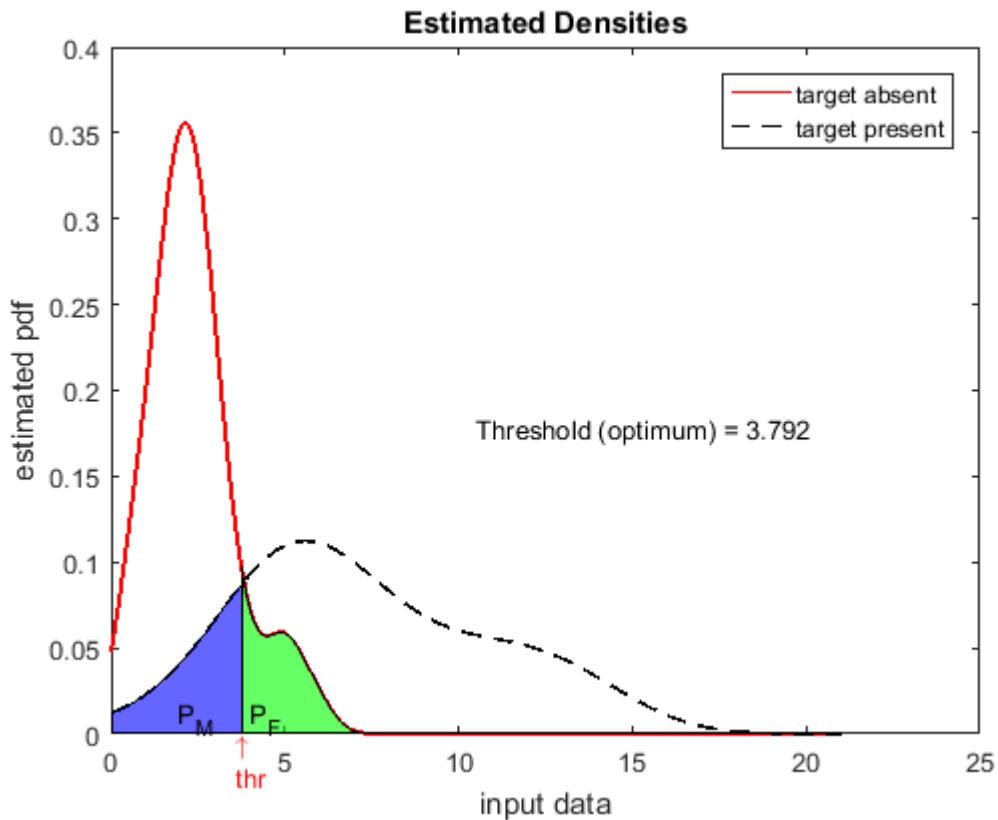
$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{9}{10} & \frac{1}{10} \\ \frac{1}{10} & \frac{9}{10} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.9 & 0.1 \\ 0.1 & 0.9 \end{bmatrix}$$

$$P_F = \frac{1}{10} = 0.1 \quad P_M = \frac{1}{10} = 0.1 \quad \text{PPV} = \frac{27}{31} = 0.87097$$

p m shankar





Confusion Matrix : Threshold (optimum) = 3.792

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	4	36
	Target Present	27	3
	Total Counts	31	39

dist to top left corner of the ROC curve = 0.141

Transition Matrix: Threshold (optimum) = 3.792

$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{9}{10} & \frac{1}{10} \\ \frac{1}{10} & \frac{9}{10} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.9 & 0.1 \\ 0.1 & 0.9 \end{bmatrix}$$

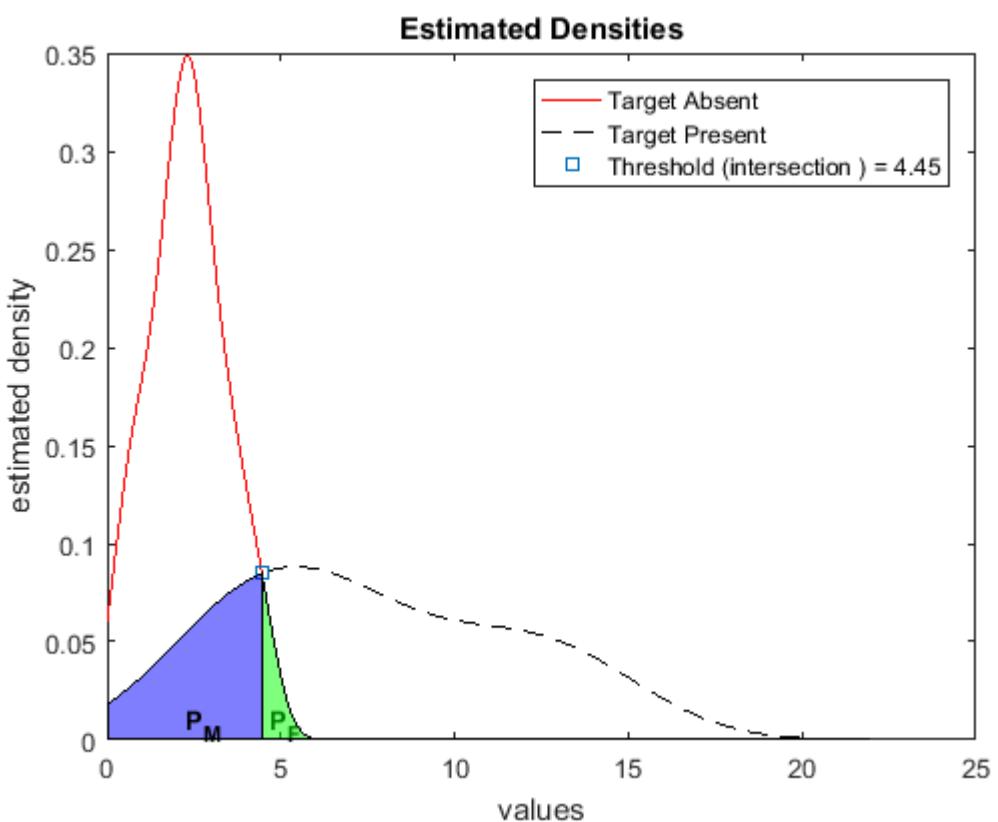
$$P_F = \frac{1}{10} = 0.1 \quad P_M = \frac{1}{10} = 0.1 \quad \text{PPV} = \frac{27}{31} = 0.87097$$

p m shankar

data (Ciliberto)

Target Absent					Target Present				
2.525	1.854	3.056	2.33	2.227	7.121	5.971	3.491	4.276	4.64
3.342	0.84	3.298	2.226	2.385	2.613	12.698	8.706	7.346	11.584
3.806	1.866	2.718	2.182	1.357	13.149	3.688	5.837	8.158	14.389
3.593	1.954	4.532	2.074	3.612	3.135	2.967	10.75	9.62	5.854
0.838	1.708	2.79	1.574	4.347	14.643	11.964	5.183	5.545	12.338
0.375	2.615	0.759	3.602	1.446	12.81	3.308	8.487	6.584	4.667
2.223	1.622	2.646	1.06	4.335					
0.356	0.584	2.852	2.521	2.477					

(c) P. M. Shankar



Confusion Matrix: Threshold (intersection) = 4.45

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	1	39
	Target Present	23	7
	Total Counts	24	46

dist to top left corner of the ROC curve = 0.235

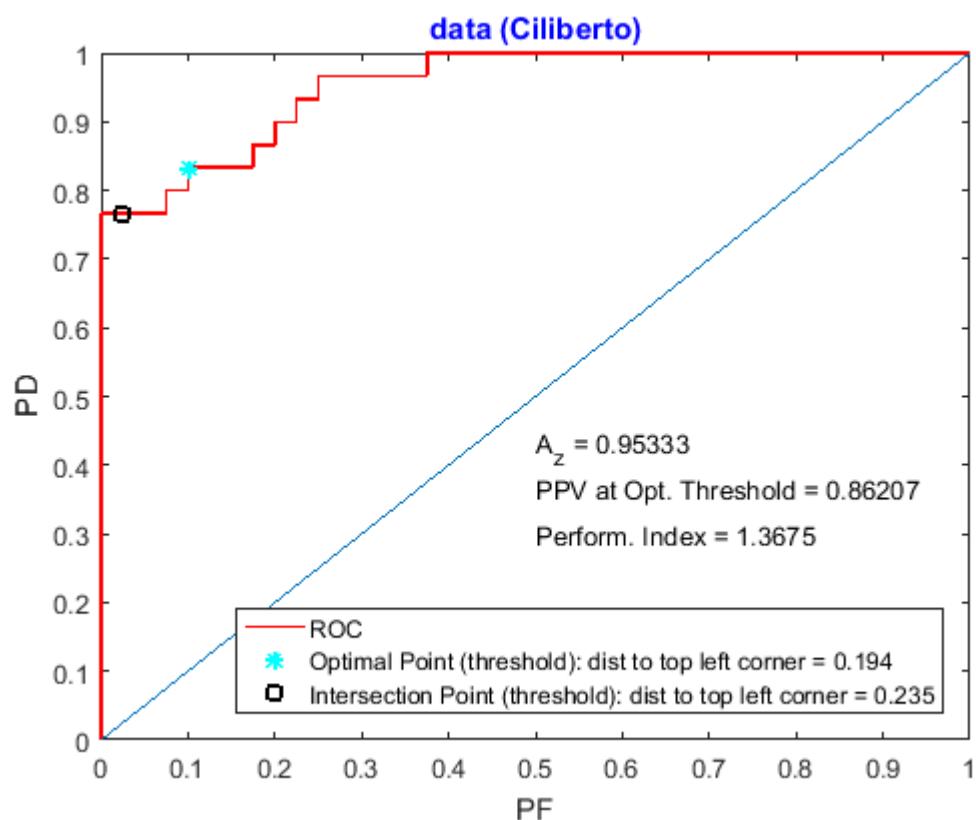
Transition Matrix: Threshold (intersection) = 4.45

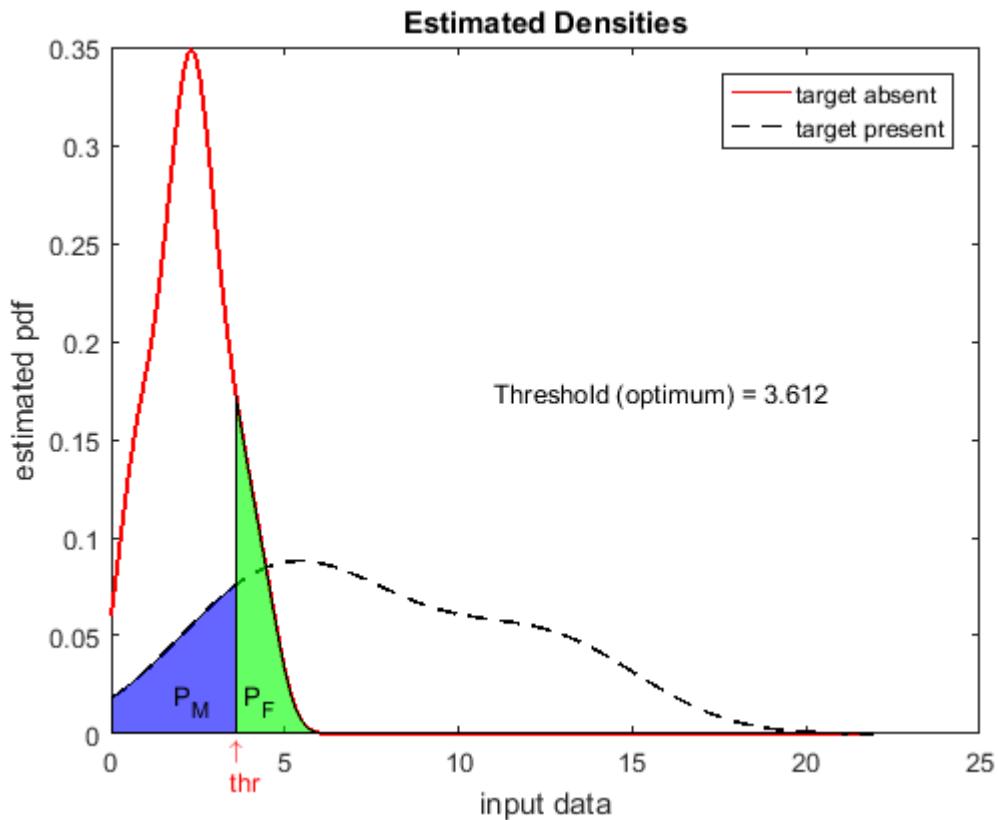
$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{39}{40} & \frac{7}{30} \\ \frac{1}{40} & \frac{23}{30} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.975 & 0.2333 \\ 0.025 & 0.7667 \end{bmatrix}$$

$$P_F = \frac{1}{40} = 0.025 \quad P_M = \frac{7}{30} = 0.2333 \quad \text{PPV} = \frac{23}{24} = 0.95833$$

p m shankar





Confusion Matrix : Threshold (optimum) = 3.612

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	4	36
	Target Present	25	5
	Total Counts	29	41

dist to top left corner of the ROC curve = 0.194

Transition Matrix: Threshold (optimum) = 3.612

$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{9}{10} & \frac{1}{6} \\ \frac{1}{10} & \frac{5}{6} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.9 & 0.1667 \\ 0.1 & 0.8333 \end{bmatrix}$$

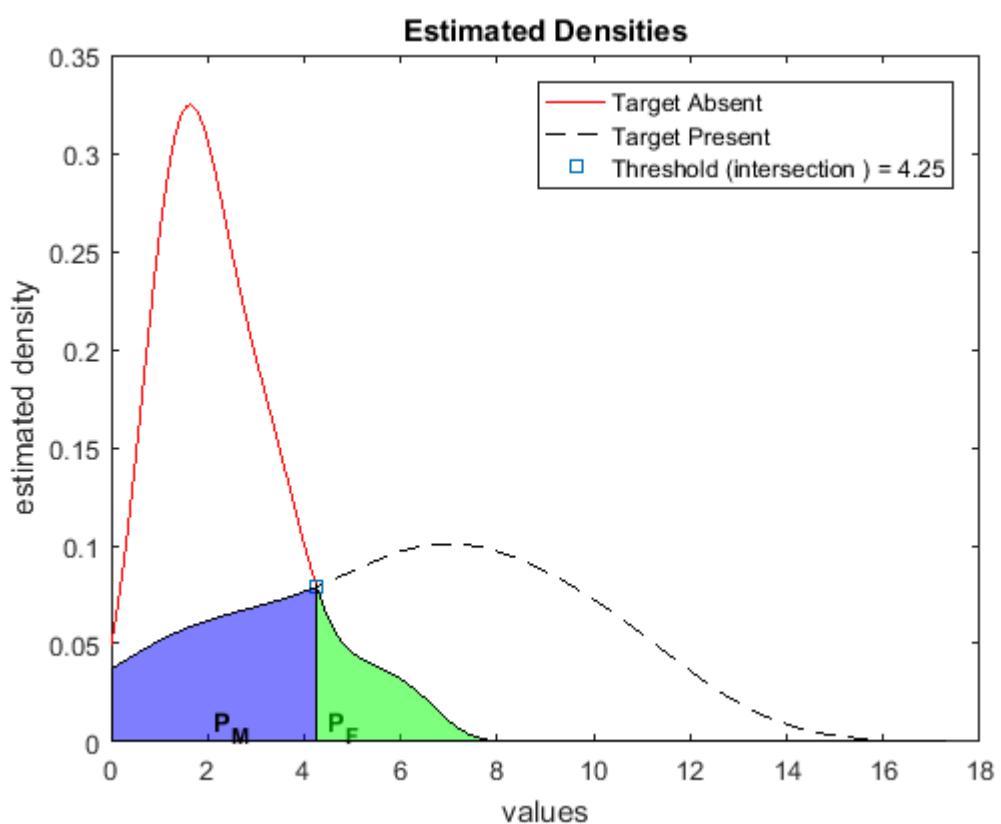
$$P_F = \frac{1}{10} = 0.1 \quad P_M = \frac{1}{6} = 0.16667 \quad \text{PPV} = \frac{25}{29} = 0.86207$$

p m shankar

data (Davis A)

Target Absent					Target Present				
1.501	3.03	1.04	0.835	0.886	4.765	1.461	6.025	9.035	7.888
3.497	0.965	1.722	0.577	3.411	0.569	6.485	8.898	3.326	10.355
1.766	2.669	2.461	1.955	1.74	4.829	10.57	10.359	8.227	5.783
6.372	1.1	1.532	2.698	1.146	9.307	1.935	4.438	11.535	0.307
3.646	2.178	5.577	1.202	1.921	1.873	7.286	6.68	10.404	6.662
4.062	1.117	2.599	2.056	1.56	6.618	6.317	7.153	2.057	2.419
4.321	3.19	1.881	2.789	1.84					
1.08	2.332	5.059	3.443	1.55					

(c) P. M. Shankar



Confusion Matrix: Threshold (intersection) = 4.25

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	4	36
	Target Present	22	8
	Total Counts	26	44

dist to top left corner of the ROC curve = 0.285

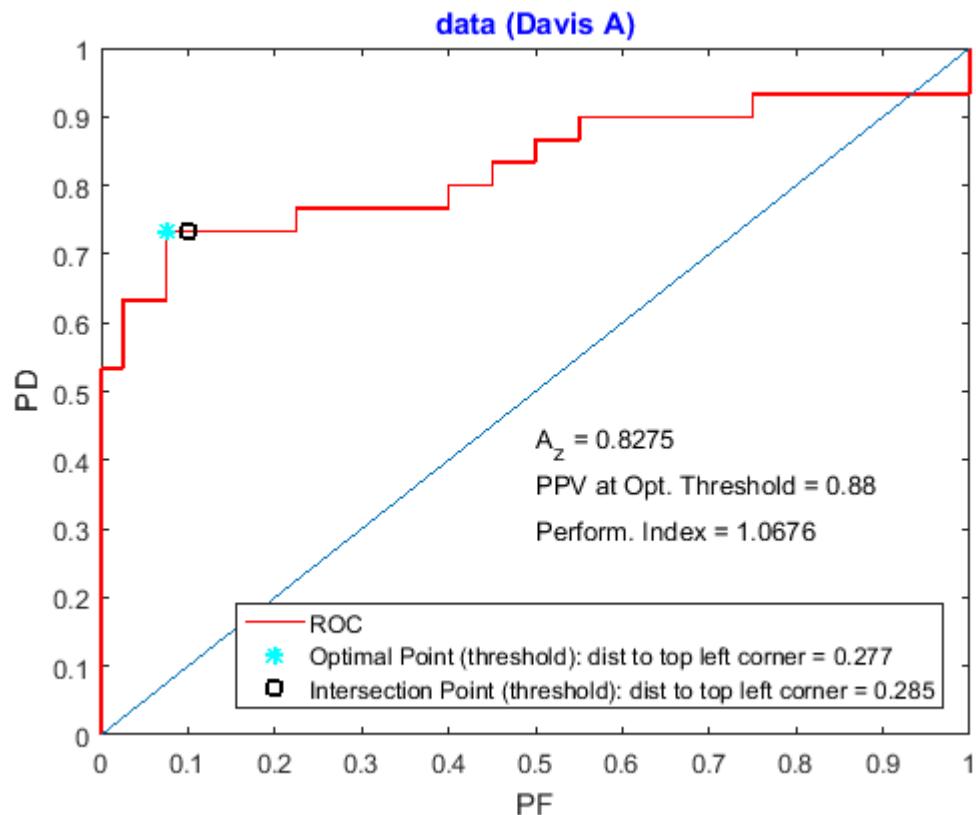
Transition Matrix: Threshold (intersection) = 4.25

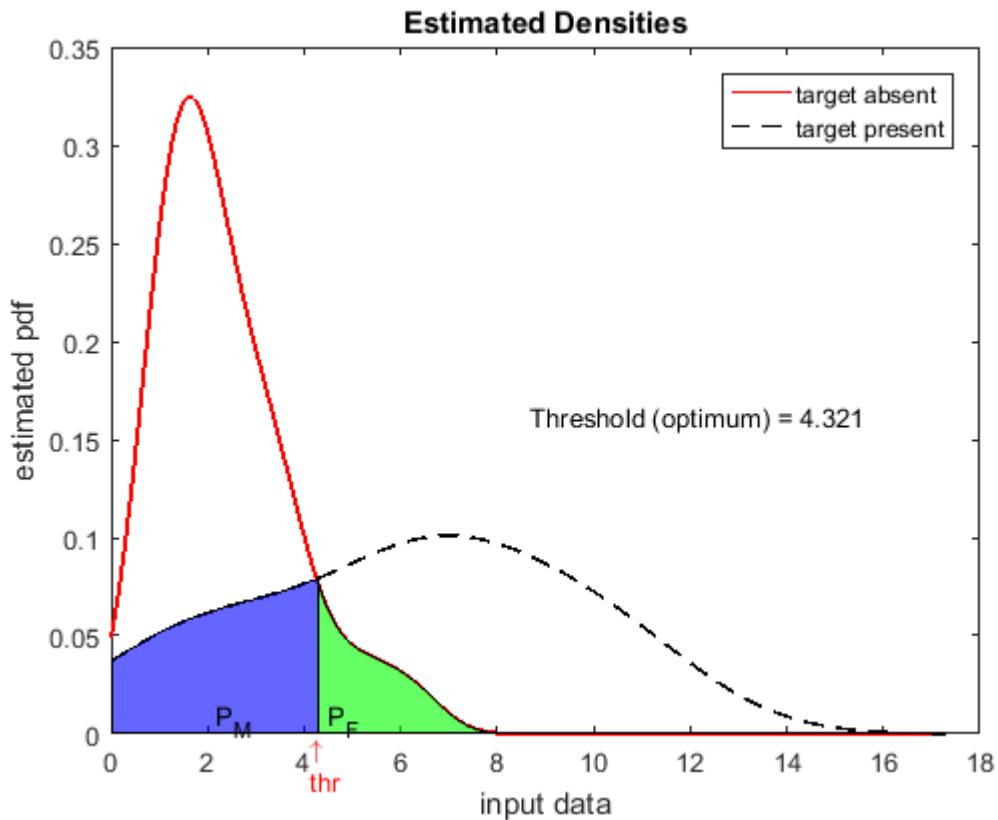
$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{9}{10} & \frac{4}{15} \\ \frac{1}{10} & \frac{11}{15} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.9 & 0.26667 \\ 0.1 & 0.7333 \end{bmatrix}$$

$$P_F = \frac{1}{10} = 0.1 \quad P_M = \frac{4}{15} = 0.26667 \quad \text{PPV} = \frac{11}{13} = 0.84615$$

p m shankar





Confusion Matrix : Threshold (optimum) = 4.321

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	3	37
	Target Present	22	8
	Total Counts	25	45

dist to top left corner of the ROC curve = 0.277

Transition Matrix: Threshold (optimum) = 4.321

$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{37}{40} & \frac{4}{15} \\ \frac{3}{40} & \frac{11}{15} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.925 & 0.2667 \\ 0.075 & 0.7333 \end{bmatrix}$$

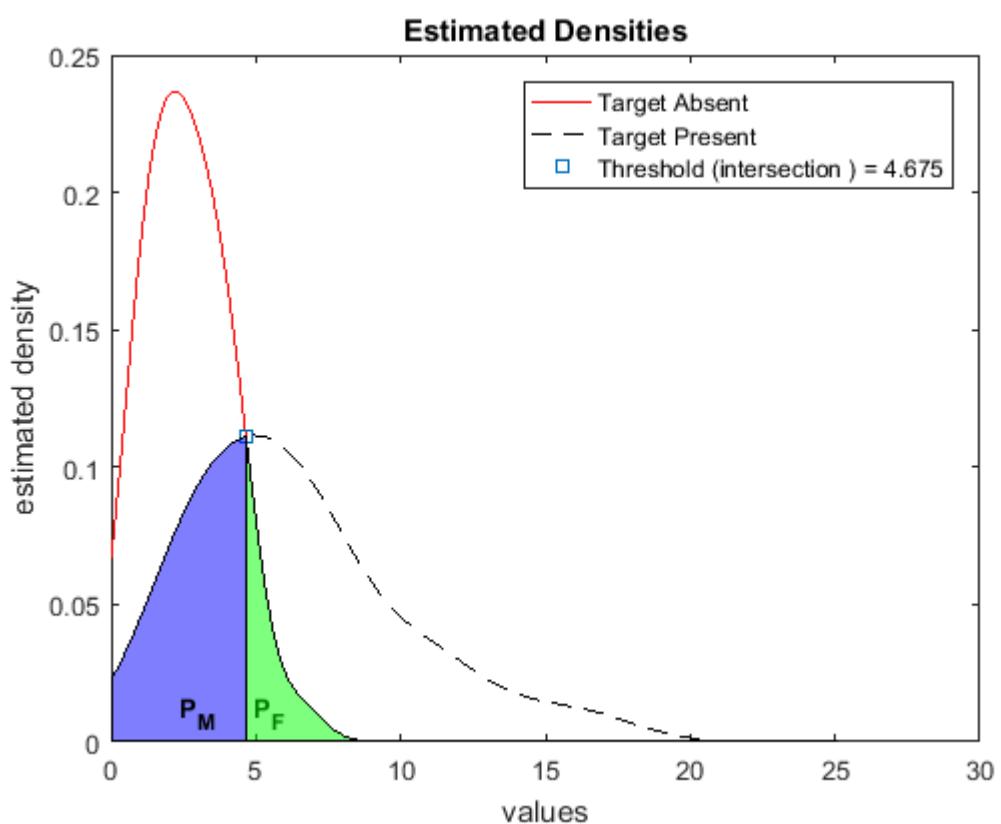
$$P_F = \frac{3}{40} = 0.075 \quad P_M = \frac{4}{15} = 0.26667 \quad \text{PPV} = \frac{22}{25} = 0.88$$

p m shankar

data (Davis E)

Target Absent					Target Present				
2.103	4.421	1.139	1.471	2.051	7.659	6.967	6.891	5.131	3.929
1.59	1.007	6.515	0.723	2.937	4.437	2.221	4.983	3.826	10.414
2.122	3.088	0.35	2.971	3.443	5.465	8.067	11.548	2.984	11.709
4.082	1.194	3.763	3.109	4.502	16.743	6.362	7.557	4.6	3.211
2.268	2.478	4.973	1.736	3.997	2.435	2.397	10.257	14.394	1.735
0.939	0.877	1.265	2.27	3.336	5.595	5.274	6.363	2.437	8.018
2.55	2.217	3.931	3.863	4.564					
1.172	1.403	2.778	3.607	2.476					

(c) P. M. Shankar



Confusion Matrix: Threshold (intersection) = 4.675

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	2	38
	Target Present	19	11
	Total Counts	21	49

dist to top left corner of the ROC curve = 0.37

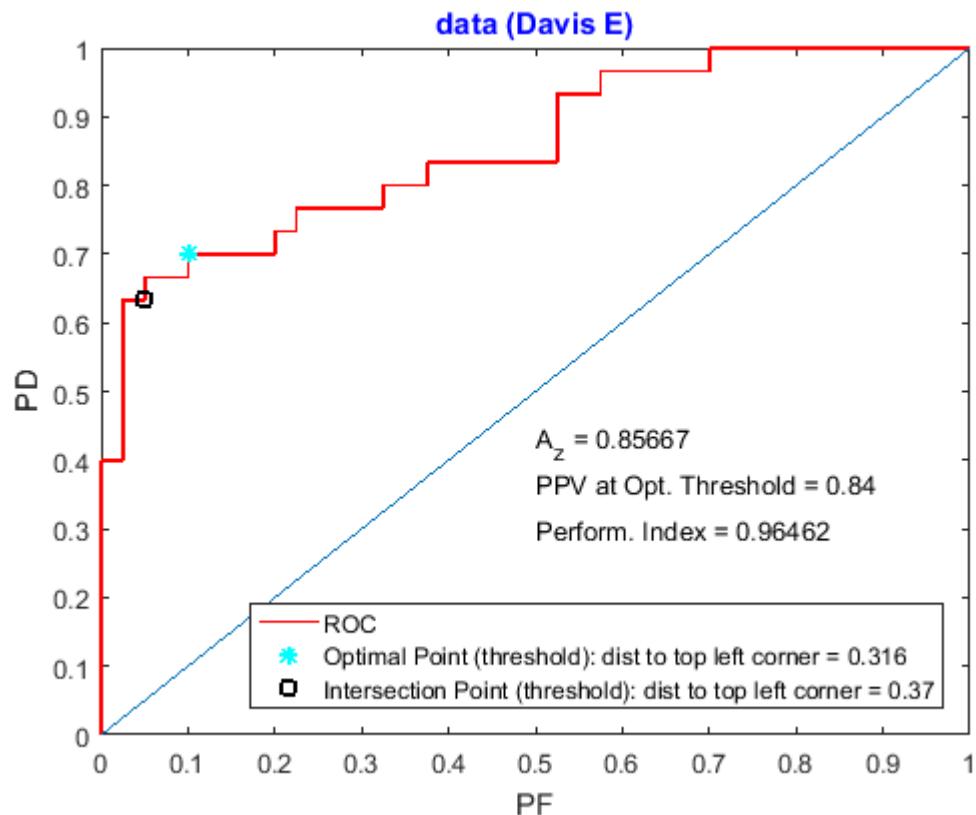
Transition Matrix: Threshold (intersection) = 4.675

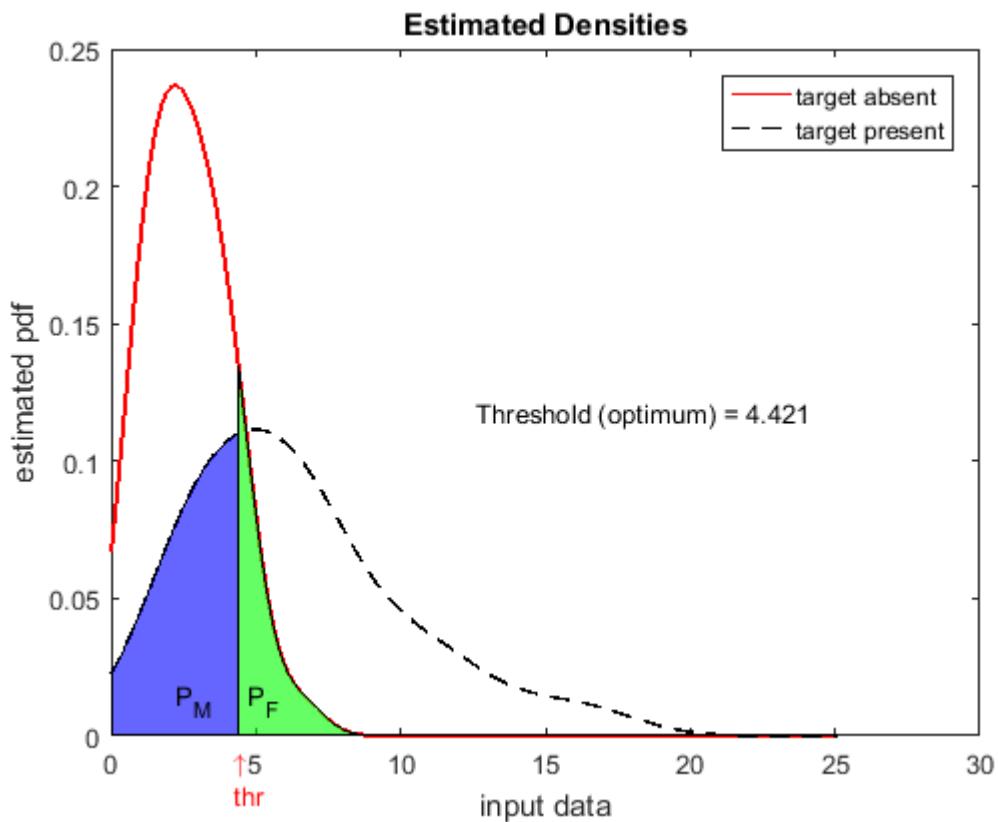
$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{19}{20} & \frac{11}{30} \\ \frac{1}{20} & \frac{19}{30} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.95 & 0.36667 \\ 0.05 & 0.6333 \end{bmatrix}$$

$$P_F = \frac{1}{20} = 0.05 \quad P_M = \frac{11}{30} = 0.36667 \quad \text{PPV} = \frac{19}{21} = 0.90476$$

p m shankar





Confusion Matrix : Threshold (optimum) = 4.421

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	4	36
	Target Present	21	9
	Total Counts	25	45

dist to top left corner of the ROC curve = 0.316

Transition Matrix: Threshold (optimum) = 4.421

$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{9}{10} & \frac{3}{10} \\ \frac{1}{10} & \frac{7}{10} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.9 & 0.3 \\ 0.1 & 0.7 \end{bmatrix}$$

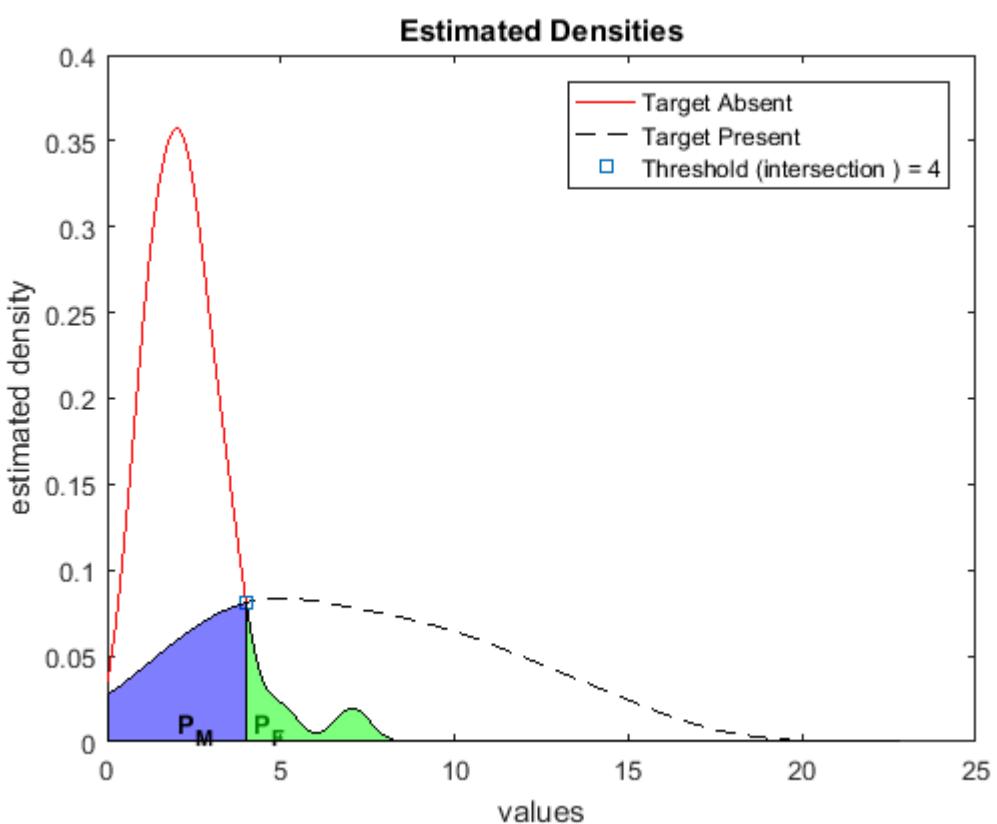
$$P_F = \frac{1}{10} = 0.1 \quad P_M = \frac{3}{10} = 0.3 \quad \text{PPV} = \frac{21}{25} = 0.84$$

p m shankar

data (deGruchy)

Target Absent					Target Present				
2.393	2.153	2.942	1.501	2.531	4.766	9.605	1.084	8.884	8.888
1.443	0.95	2.34	3.946	2.517	11.871	3.72	1.881	4.381	2.4
3.595	0.654	2.139	2.311	3.418	15.211	13.869	8.722	1.786	8.238
3.122	3.058	1.253	5.001	2.076	2.88	11.167	12.021	7.075	13.787
1.94	7.056	1.71	1.771	1.505	5.775	3.856	9.372	6.03	3.958
2.699	2.761	1.791	3.278	1.212	4.705	6.207	10.727	4.317	7.157
1.265	2.073	0.973	0.926	0.541					
1.628	2.468	2.249	3.596	1.332					

(c) P. M. Shankar



Confusion Matrix: Threshold (intersection) = 4

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	2	38
	Target Present	22	8
	Total Counts	24	46

dist to top left corner of the ROC curve = 0.271

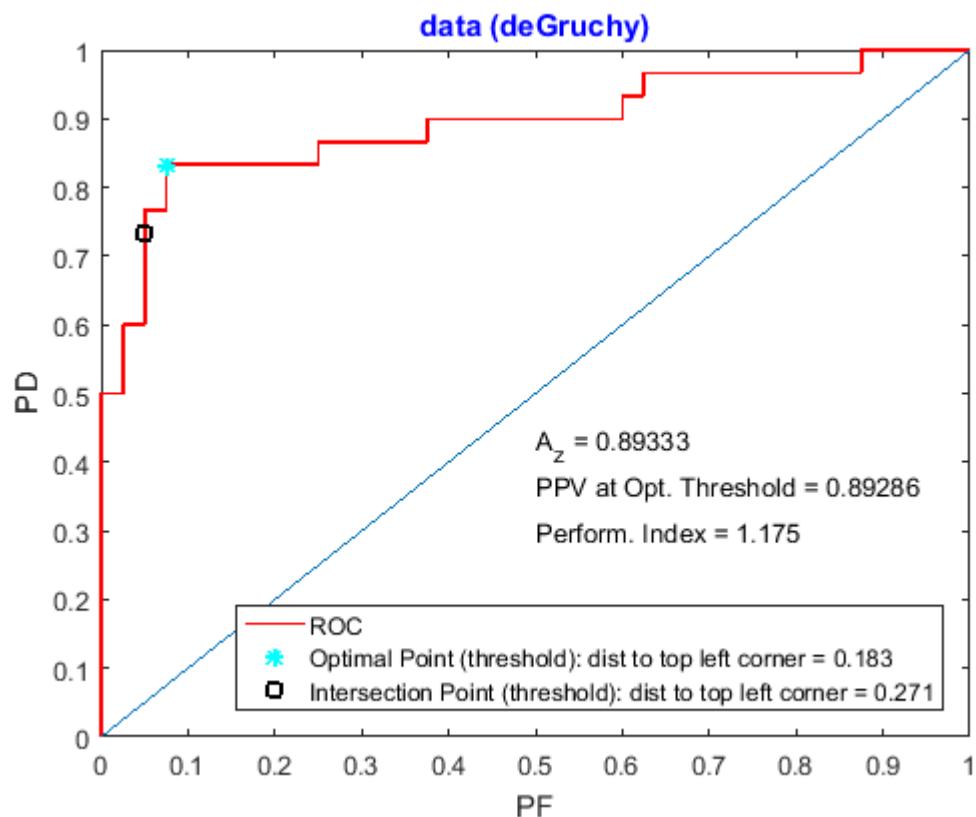
Transition Matrix: Threshold (intersection) = 4

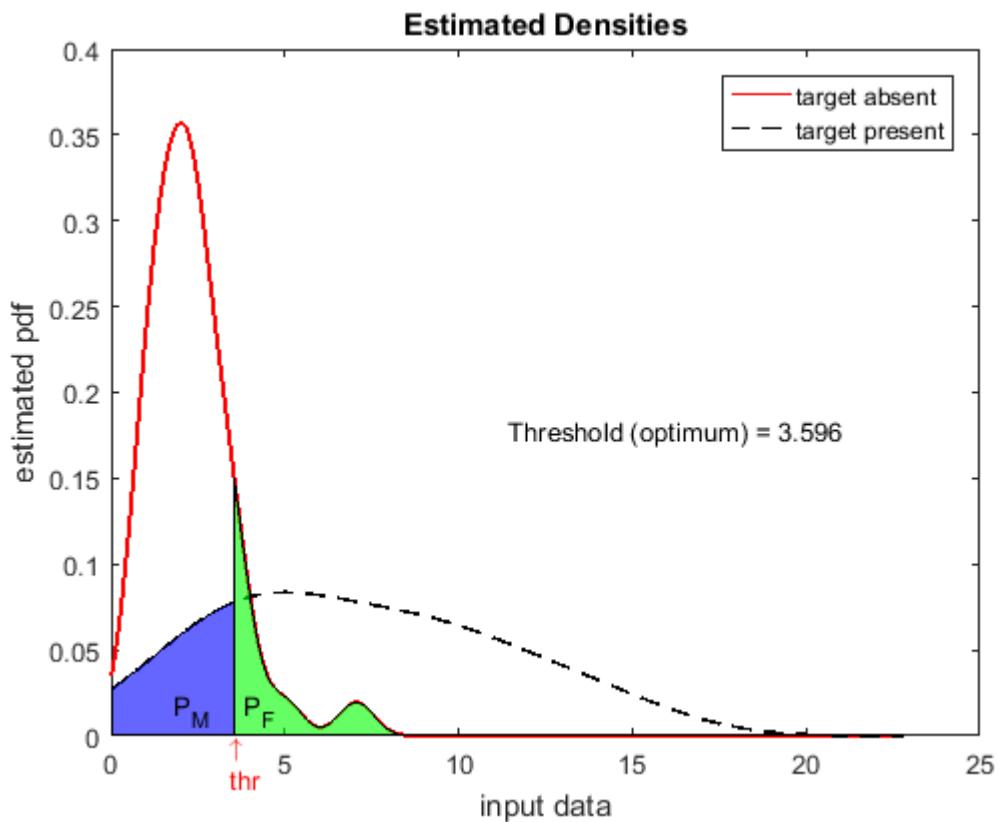
$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{19}{20} & \frac{4}{15} \\ \frac{1}{20} & \frac{11}{15} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.95 & 0.26667 \\ 0.05 & 0.7333 \end{bmatrix}$$

$$P_F = \frac{1}{20} = 0.05 \quad P_M = \frac{4}{15} = 0.26667 \quad \text{PPV} = \frac{11}{12} = 0.91667$$

p m shankar





Confusion Matrix : Threshold (optimum) = 3.596

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	3	37
	Target Present	25	5
	Total Counts	28	42

dist to top left corner of the ROC curve = 0.183

Transition Matrix: Threshold (optimum) = 3.596

$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{37}{40} & \frac{1}{6} \\ \frac{3}{40} & \frac{5}{6} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.925 & 0.1667 \\ 0.075 & 0.8333 \end{bmatrix}$$

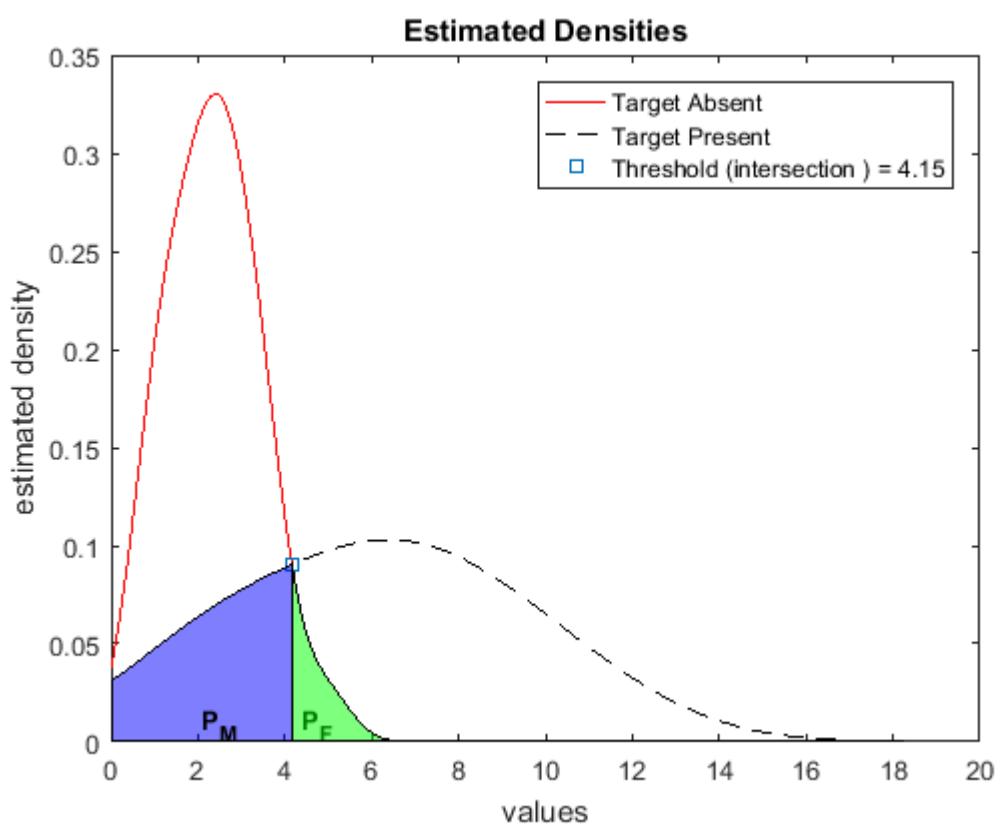
$$P_F = \frac{3}{40} = 0.075 \quad P_M = \frac{1}{6} = 0.16667 \quad \text{PPV} = \frac{25}{28} = 0.89286$$

p m shankar

data (Deitrich)

Target Absent					Target Present				
3.625	1.814	2.043	3.654	0.787	2.555	3.566	5.231	9.213	1.644
2.132	3.013	1.969	0.507	2.337	7.042	8.57	6.981	6.011	10.194
1.592	1.355	2.646	2.976	2.784	6.332	9.134	5.841	2.434	7.167
1.237	0.957	2.489	2.67	1.132	7.147	1.172	9.839	2.082	5.195
2.436	2.159	2.641	0.979	3.048	7.5	3.48	9.108	4.657	6.376
1.66	3.165	4.399	2.381	3.176	12.172	6.624	10.955	1.837	3.714
3.492	2.82	0.783	2.169	3.652					
1.833	3.568	5.084	1.3	1.618					

(c) P. M. Shankar



Confusion Matrix: Threshold (intersection) = 4.15

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	2	38
	Target Present	21	9
	Total Counts	23	47

dist to top left corner of the ROC curve = 0.304

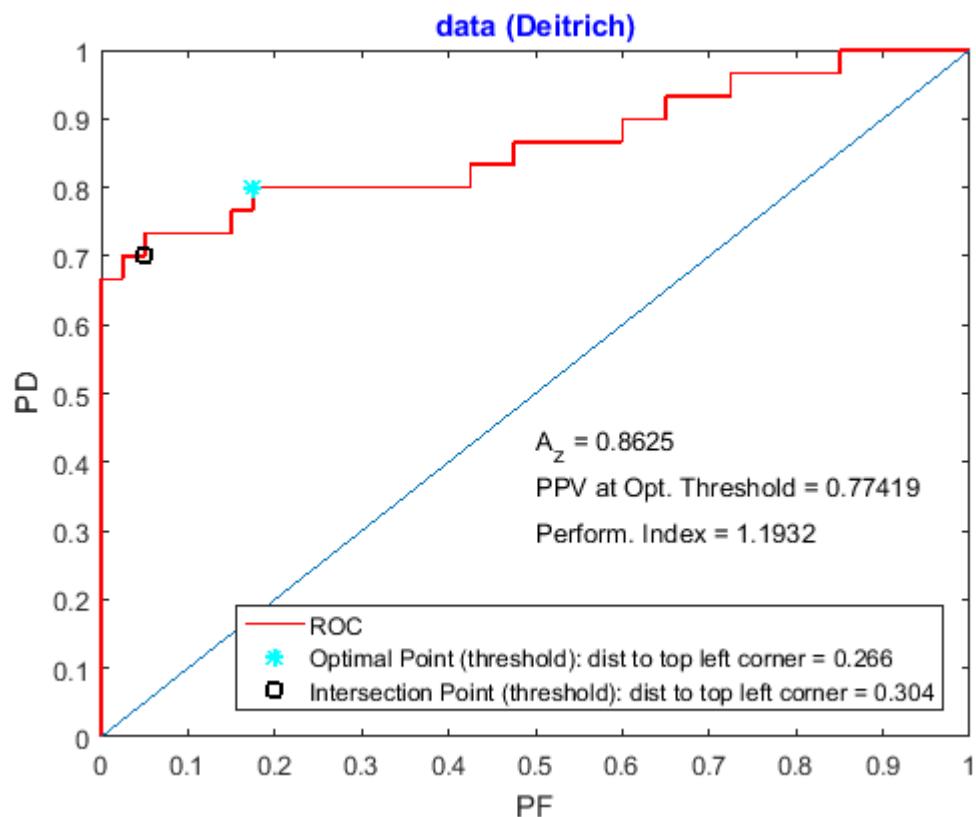
Transition Matrix: Threshold (intersection) = 4.15

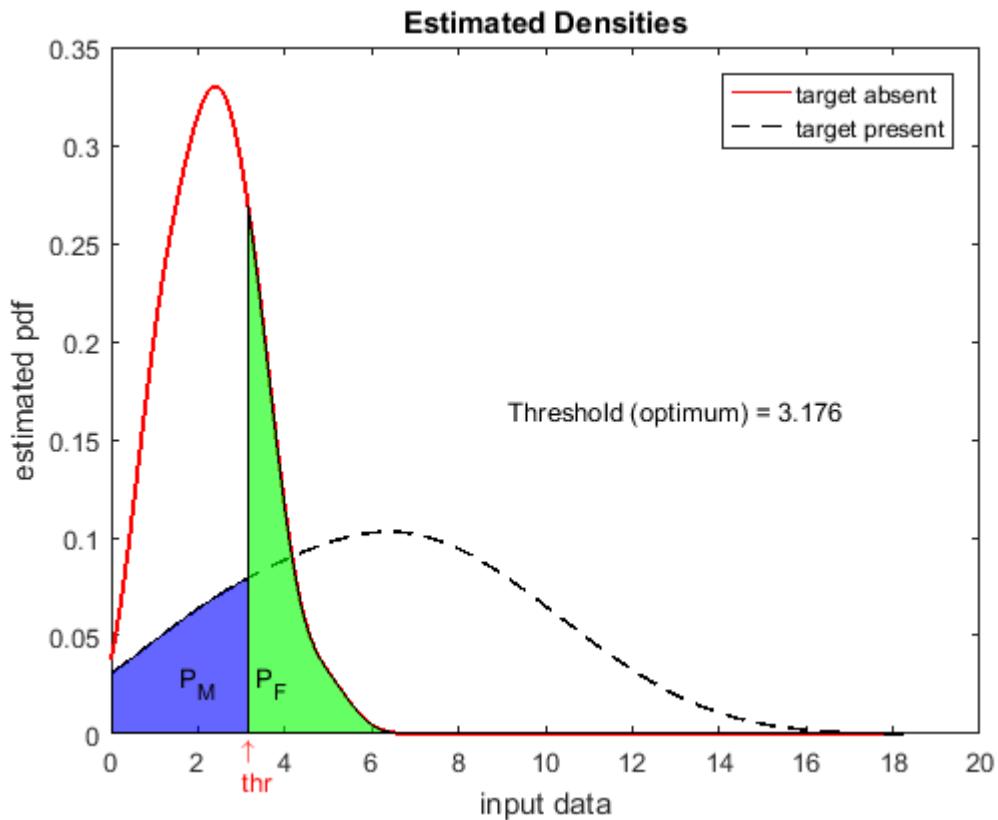
$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{19}{20} & \frac{3}{10} \\ \frac{1}{20} & \frac{7}{10} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.95 & 0.3 \\ 0.05 & 0.7 \end{bmatrix}$$

$$P_F = \frac{1}{20} = 0.05 \quad P_M = \frac{3}{10} = 0.3 \quad \text{PPV} = \frac{21}{23} = 0.91304$$

p m shankar





Confusion Matrix : Threshold (optimum) = 3.176

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	7	33
	Target Present	24	6
	Total Counts	31	39

dist to top left corner of the ROC curve = 0.266

Transition Matrix: Threshold (optimum) = 3.176

$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{33}{40} & \frac{1}{5} \\ \frac{7}{40} & \frac{4}{5} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.825 & 0.2 \\ 0.175 & 0.8 \end{bmatrix}$$

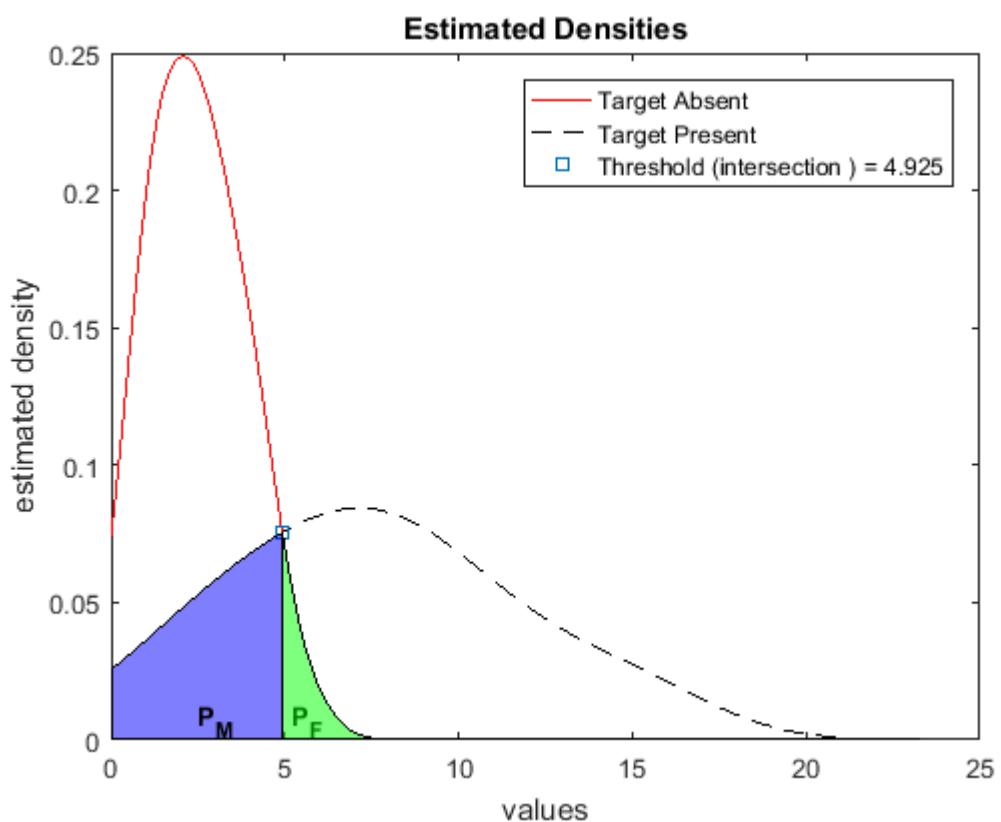
$$P_F = \frac{7}{40} = 0.175 \quad P_M = \frac{1}{5} = 0.2 \quad \text{PPV} = \frac{24}{31} = 0.77419$$

p m shankar

data (Deng)

Target Absent					Target Present				
1.333	4.596	1.137	2.142	3.342	9.691	15.056	8.034	11.854	7.465
4.381	3.44	3.181	1.26	1.918	5.674	15.526	6.26	9.628	10.609
1.259	2.247	4.072	5.596	0.881	0.337	13.072	3.505	4.039	14.804
0.883	4.044	0.676	1.324	2.963	10.148	6.796	8.339	5.215	7.334
3.14	1.75	1.076	2.266	2.357	8.332	0.99	10.989	5.83	2.412
0.099	1.115	1.499	2.11	0.823	3.823	6.622	2.329	8.157	3.628
4.298	2.728	2.486	2.498	3.98					
3.357	2.778	4.074	2.136	2.82					

(c) P. M. Shankar



Confusion Matrix: Threshold (intersection) = 4.925

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	1	39
	Target Present	22	8
	Total Counts	23	47

dist to top left corner of the ROC curve = 0.268

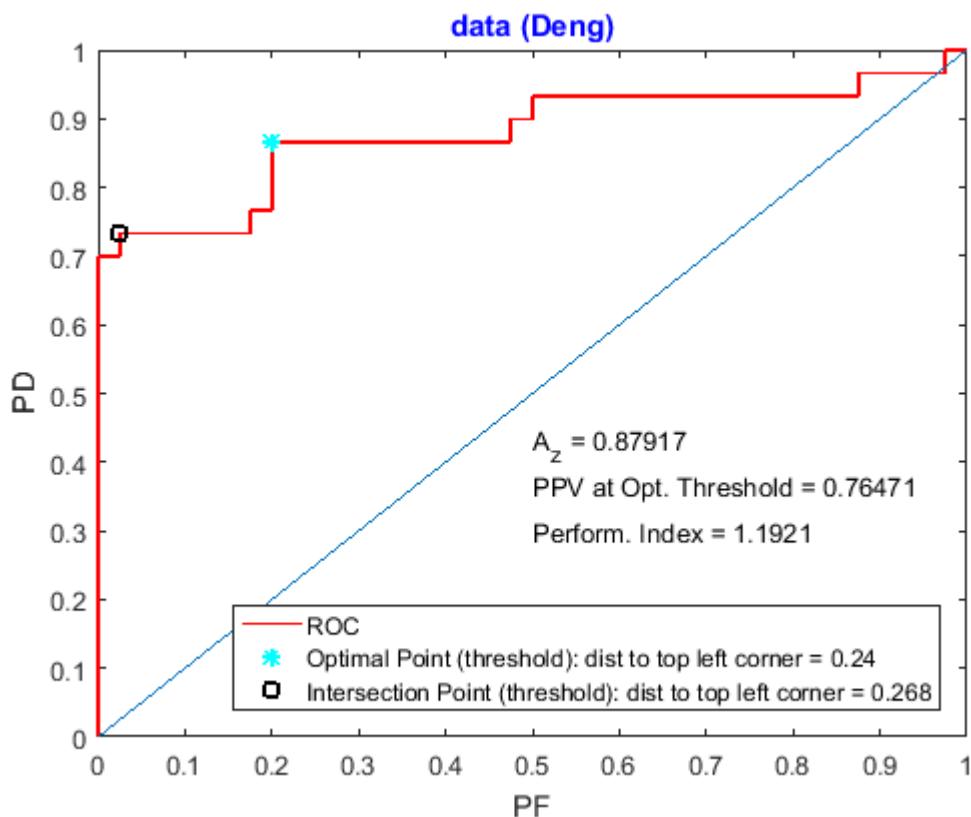
Transition Matrix: Threshold (intersection) = 4.925

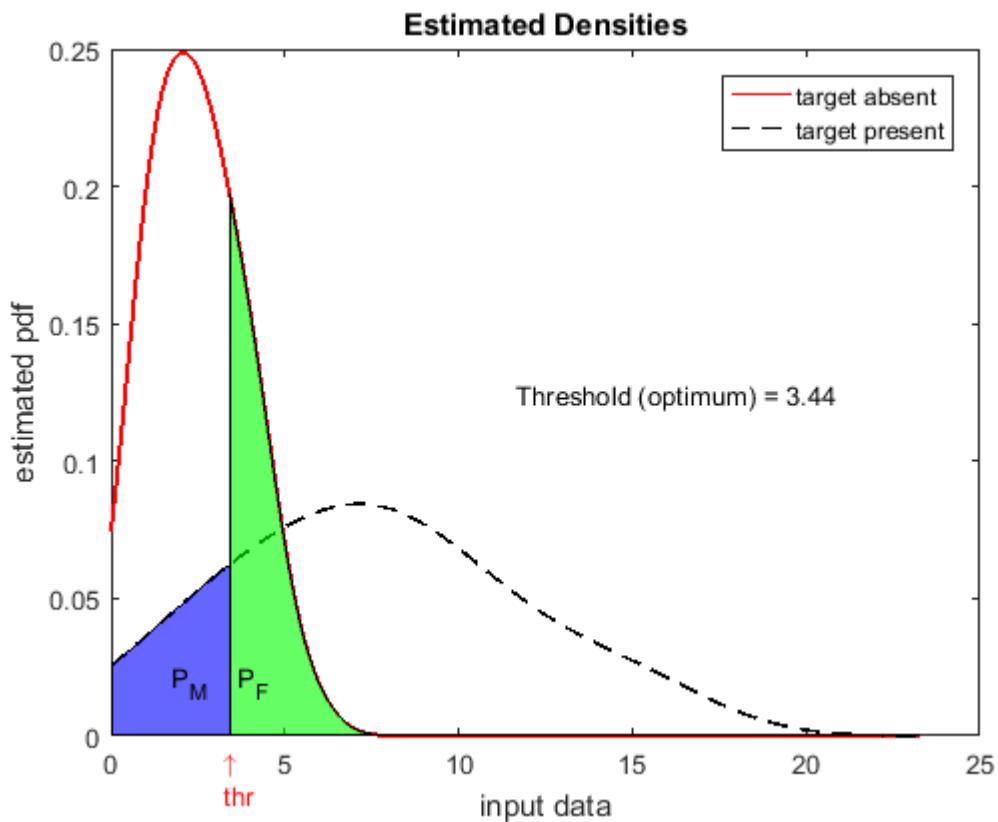
$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{39}{40} & \frac{4}{15} \\ \frac{1}{40} & \frac{11}{15} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.975 & 0.26667 \\ 0.025 & 0.7333 \end{bmatrix}$$

$$P_F = \frac{1}{40} = 0.025 \quad P_M = \frac{4}{15} = 0.26667 \quad \text{PPV} = \frac{22}{23} = 0.95652$$

p m shankar





Confusion Matrix : Threshold (optimum) = 3.44

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	8	32
	Target Present	26	4
	Total Counts	34	36

dist to top left corner of the ROC curve = 0.24

Transition Matrix: Threshold (optimum) = 3.44

$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{4}{5} & \frac{2}{15} \\ \frac{1}{5} & \frac{13}{15} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.8 & 0.1333 \\ 0.2 & 0.8667 \end{bmatrix}$$

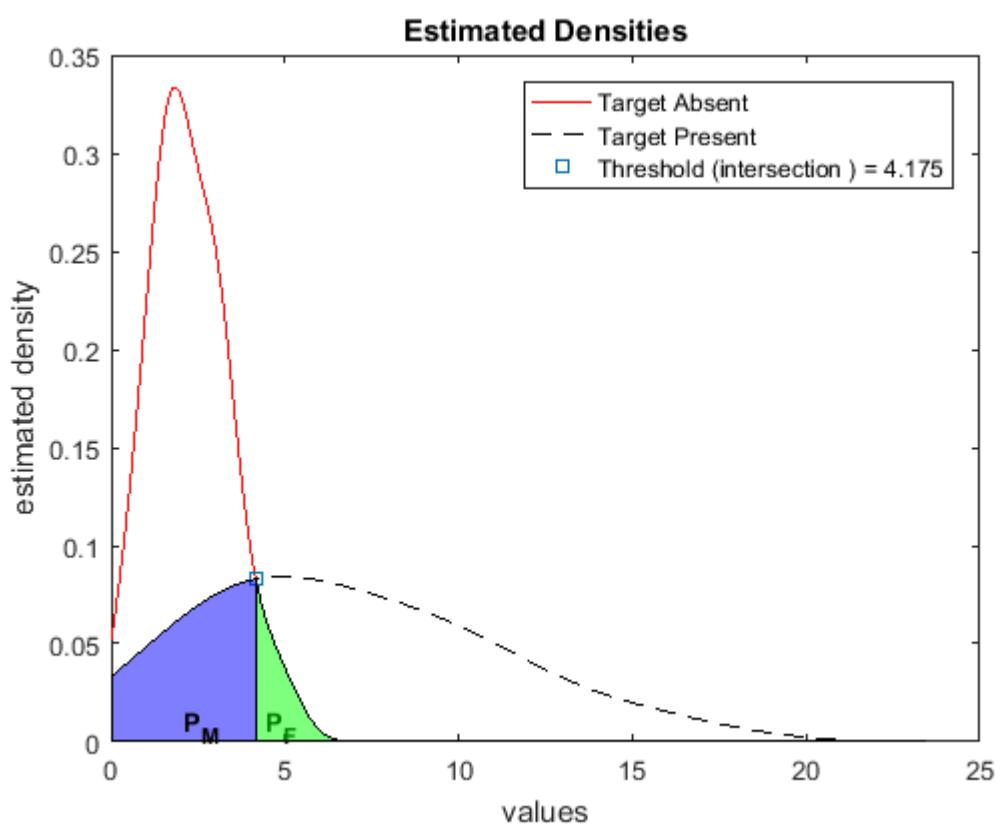
$$P_F = \frac{1}{5} = 0.2 \quad P_M = \frac{2}{15} = 0.1333 \quad \text{PPV} = \frac{13}{17} = 0.76471$$

p m shankar

data (DePaul)

Target Absent					Target Present				
3.101	3.296	3.164	4.489	5.115	9.282	7.211	10.034	2.679	9.173
0.549	2.359	2.79	1.736	1.571	5.679	15.347	15.652	2.013	7.329
3.17	3.822	0.616	2.059	1.956	9.313	4.256	11.218	4.455	4.535
2.95	1.671	3.018	1.72	2.792	1.941	3.379	4.201	6.574	4.734
2.854	1.713	1.479	3.244	0.41	5.368	3.016	12.808	0.983	6.093
1.269	2.128	3.081	4.18	1.56	9.964	1.893	9.471	4.026	10.181
2.187	1.934	1.692	1.748	1.994					
0.964	1.302	2.57	0.825	1.285					

(c) P. M. Shankar



Confusion Matrix: Threshold (intersection) = 4.175

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	3	37
	Target Present	22	8
	Total Counts	25	45

dist to top left corner of the ROC curve = 0.277

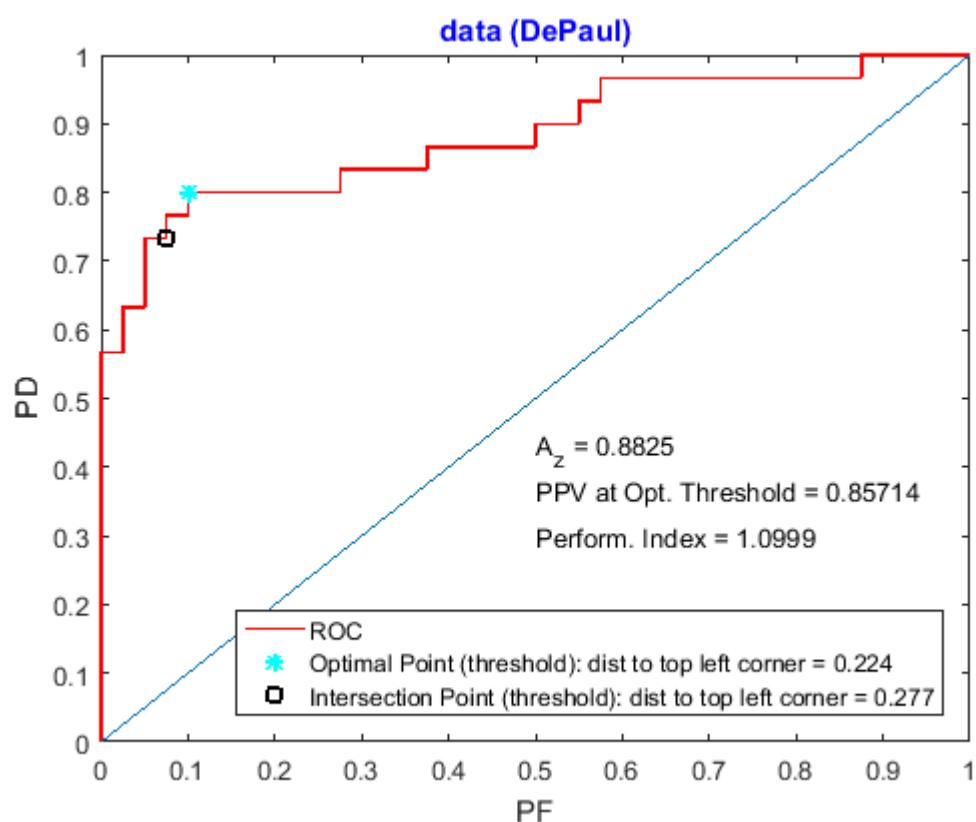
Transition Matrix: Threshold (intersection) = 4.175

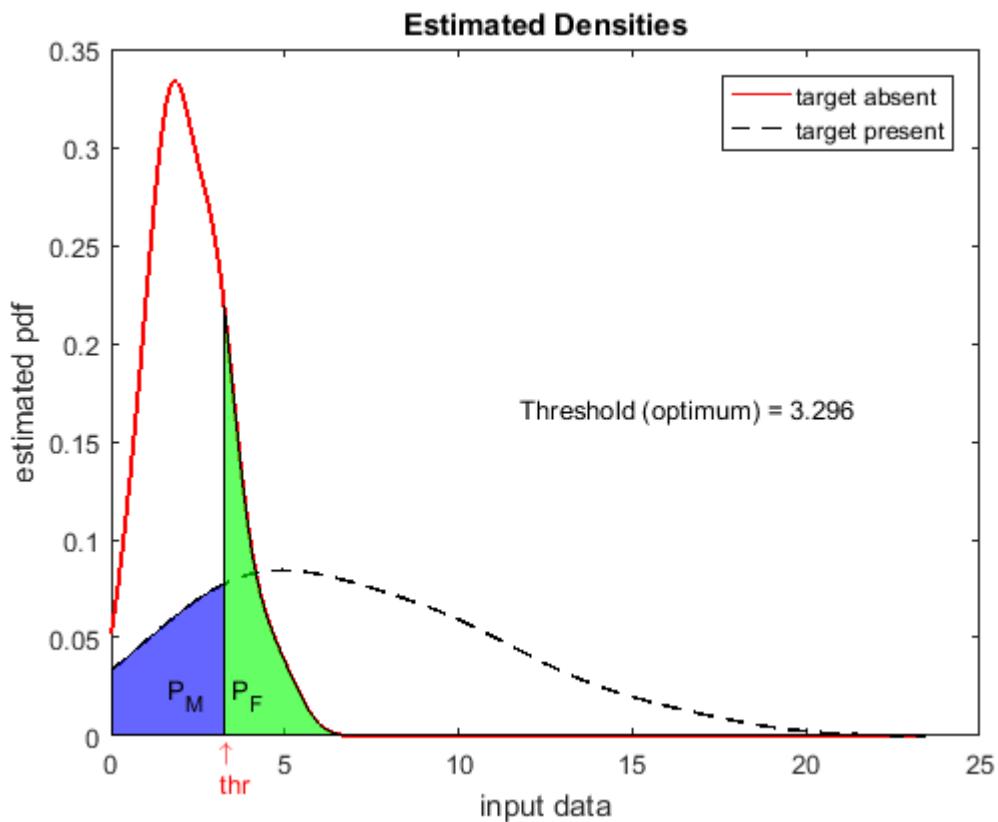
$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{37}{40} & \frac{4}{15} \\ \frac{3}{40} & \frac{11}{15} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.925 & 0.26667 \\ 0.075 & 0.7333 \end{bmatrix}$$

$$P_F = \frac{3}{40} = 0.075 \quad P_M = \frac{4}{15} = 0.26667 \quad \text{PPV} = \frac{22}{25} = 0.88$$

p m shankar





Confusion Matrix : Threshold (optimum) = 3.296

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	4	36
	Target Present	24	6
	Total Counts	28	42

dist to top left corner of the ROC curve = 0.224

Transition Matrix: Threshold (optimum) = 3.296

$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{9}{10} & \frac{1}{5} \\ \frac{1}{10} & \frac{4}{5} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.9 & 0.2 \\ 0.1 & 0.8 \end{bmatrix}$$

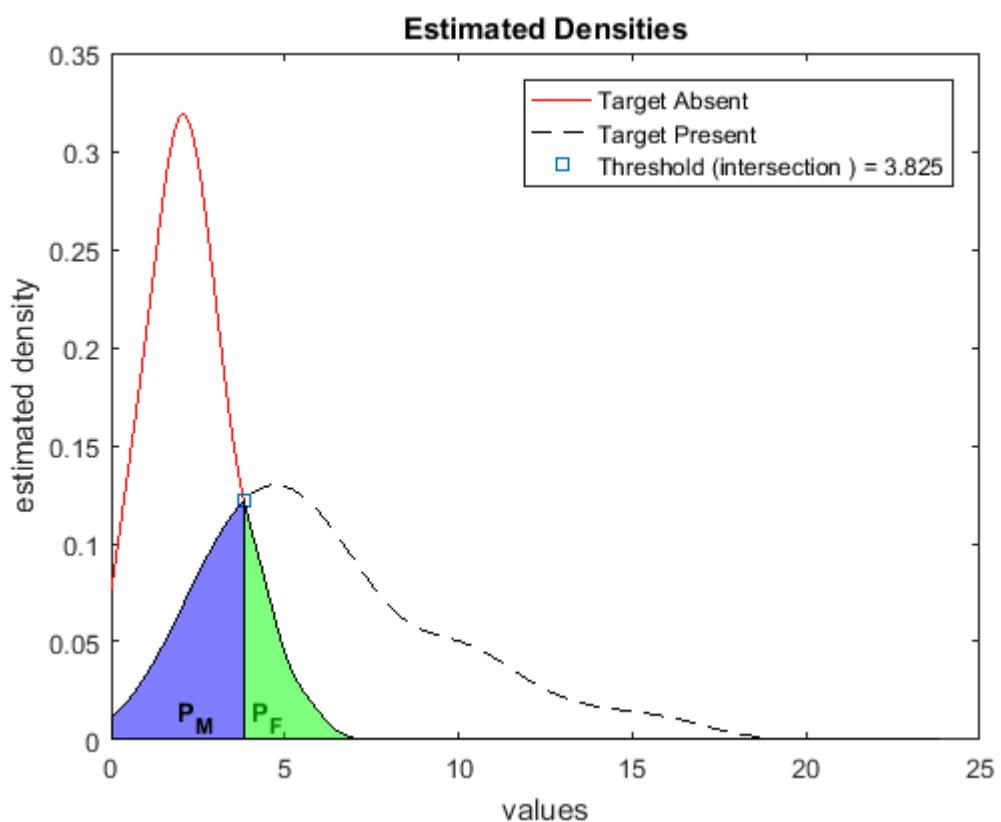
$$P_F = \frac{1}{10} = 0.1 \quad P_M = \frac{1}{5} = 0.2 \quad \text{PPV} = \frac{6}{7} = 0.85714$$

p m shankar

data (DeVane)

Target Absent					Target Present				
4.126	0.16	1.848	3.999	0.949	4.292	11.877	6.723	8.467	2.446
3.083	2.074	2.374	1.587	1.579	9.76	4.209	13.627	2.774	7.467
1.259	3.126	2.667	1.281	2.411	9.651	3.599	2.127	6.837	4.229
0.571	1.748	1.92	2.311	2.046	6.405	5.125	3.147	2.168	10.439
0.181	2.017	4.545	1.725	5.554	4.813	5.752	3.877	4.654	6.06
3.051	3.846	1.425	0.648	3.005	10.535	6.804	5.621	15.908	4.469
0.967	2.292	1.91	2.47	2.912					
0.689	3.073	4.298	2.755	1.981					

(c) P. M. Shankar



Confusion Matrix: Threshold (intersection) = 3.825

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	6	34
	Target Present	24	6
	Total Counts	30	40

dist to top left corner of the ROC curve = 0.25

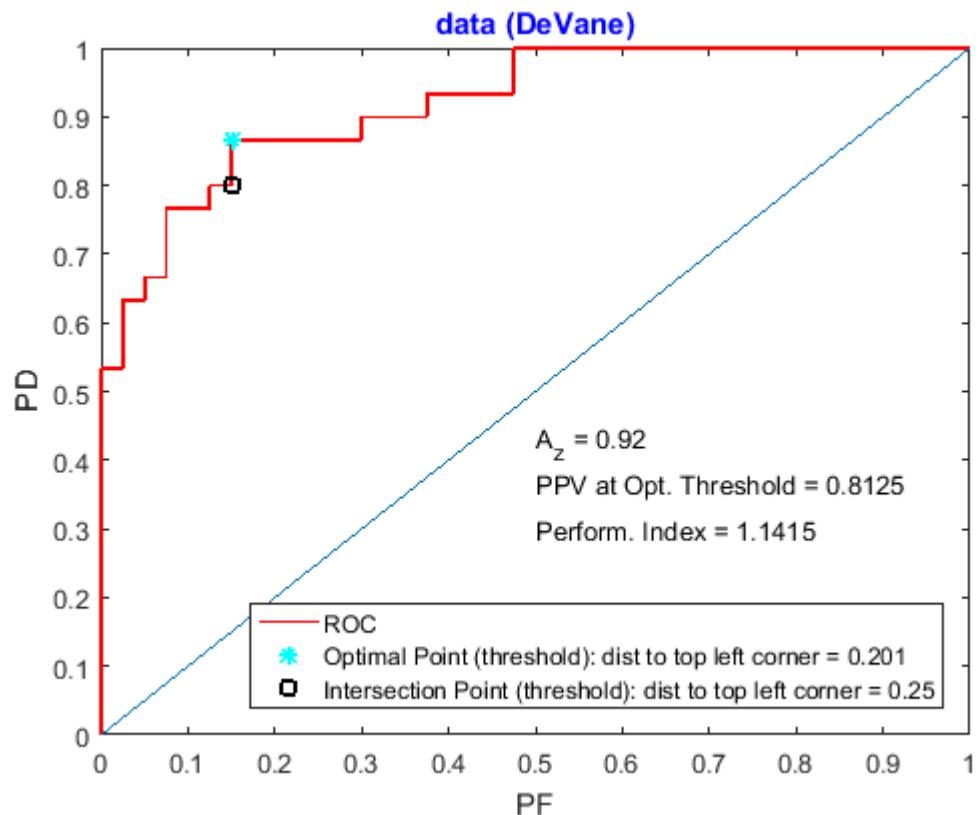
Transition Matrix: Threshold (intersection) = 3.825

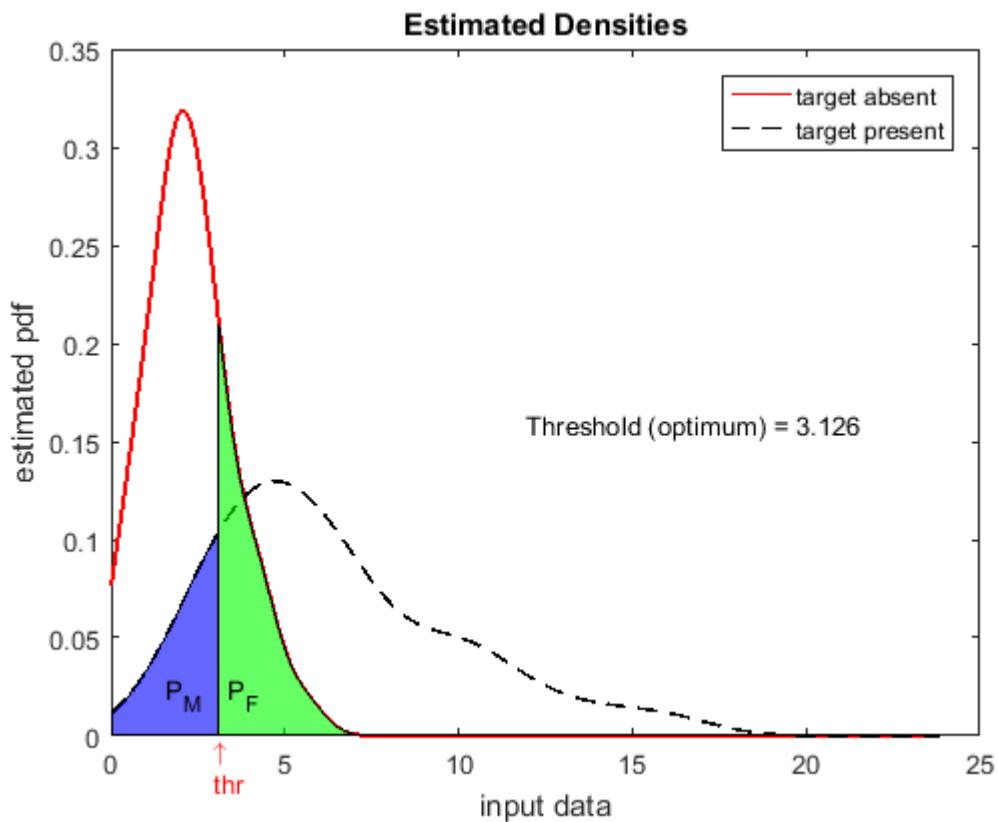
$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{17}{20} & \frac{1}{5} \\ \frac{3}{20} & \frac{4}{5} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.85 & 0.2 \\ 0.15 & 0.8 \end{bmatrix}$$

$$P_F = \frac{3}{20} = 0.15 \quad P_M = \frac{1}{5} = 0.2 \quad \text{PPV} = \frac{4}{5} = 0.8$$

p m shankar





Confusion Matrix : Threshold (optimum) = 3.126

Data Collected		Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	6	34	40
	Target Present	26	4	30
	Total Counts	32	38	70

dist to top left corner of the ROC curve = 0.201

Transition Matrix: Threshold (optimum) = 3.126

$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{17}{20} & \frac{2}{15} \\ \frac{3}{20} & \frac{13}{15} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.85 & 0.1333 \\ 0.15 & 0.8667 \end{bmatrix}$$

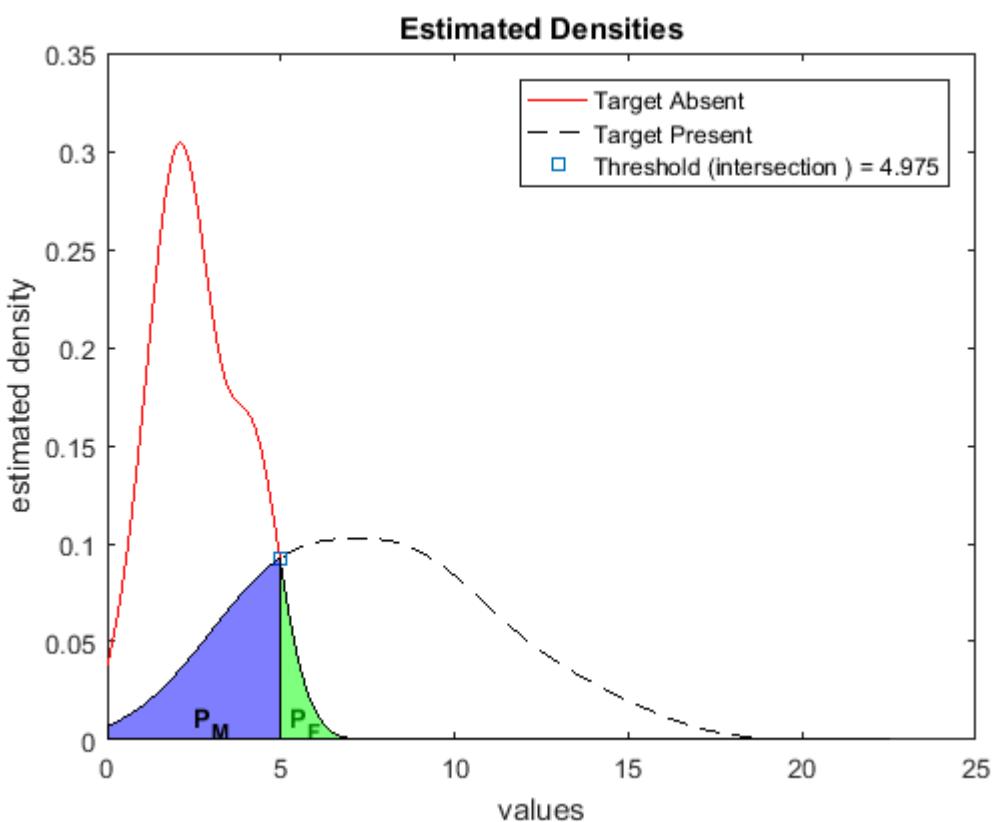
$$P_F = \frac{3}{20} = 0.15 \quad P_M = \frac{2}{15} = 0.1333 \quad \text{PPV} = \frac{13}{16} = 0.8125$$

p m shankar

data (Ding)

Target Absent					Target Present				
1.798	1.284	2.397	2.287	1.217	3.235	4.681	11.292	4.474	12.207
2.117	5.326	0.457	4.529	2.427	9.371	15.062	5.839	5.437	3.285
1.351	0.441	2.101	4.284	3.209	2.359	12.336	9.563	8.944	5.544
3.571	2.228	4.018	1.527	2.501	7.04	5.766	7.805	5.916	9.975
4.347	4.2	4.608	4.341	1.502	4.576	8.569	7.137	10.92	13.893
2.94	1.396	1.892	2.447	2.074	7.88	9.185	4.628	9.072	7.856
3.283	1.79	2.762	1.406	3.949					
4.079	2.863	2.179	2.465	1.938					

(c) P. M. Shankar



Confusion Matrix: Threshold (intersection) = 4.975

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	1	39
	Target Present	23	7
	Total Counts	24	46

dist to top left corner of the ROC curve = 0.235

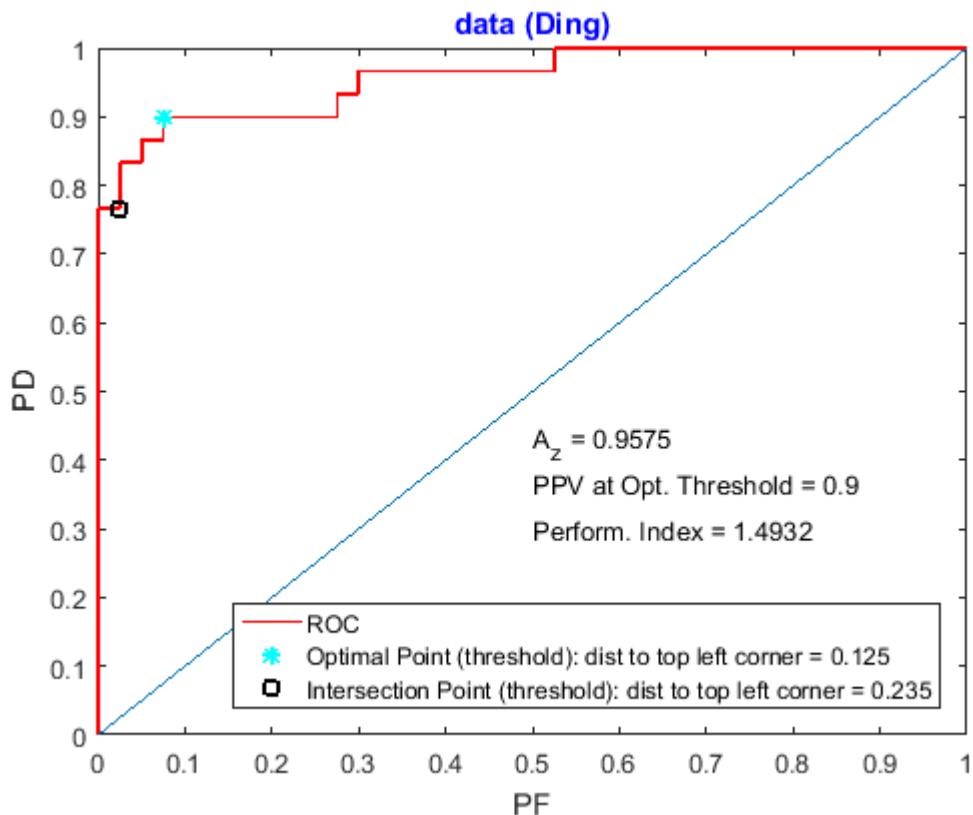
Transition Matrix: Threshold (intersection) = 4.975

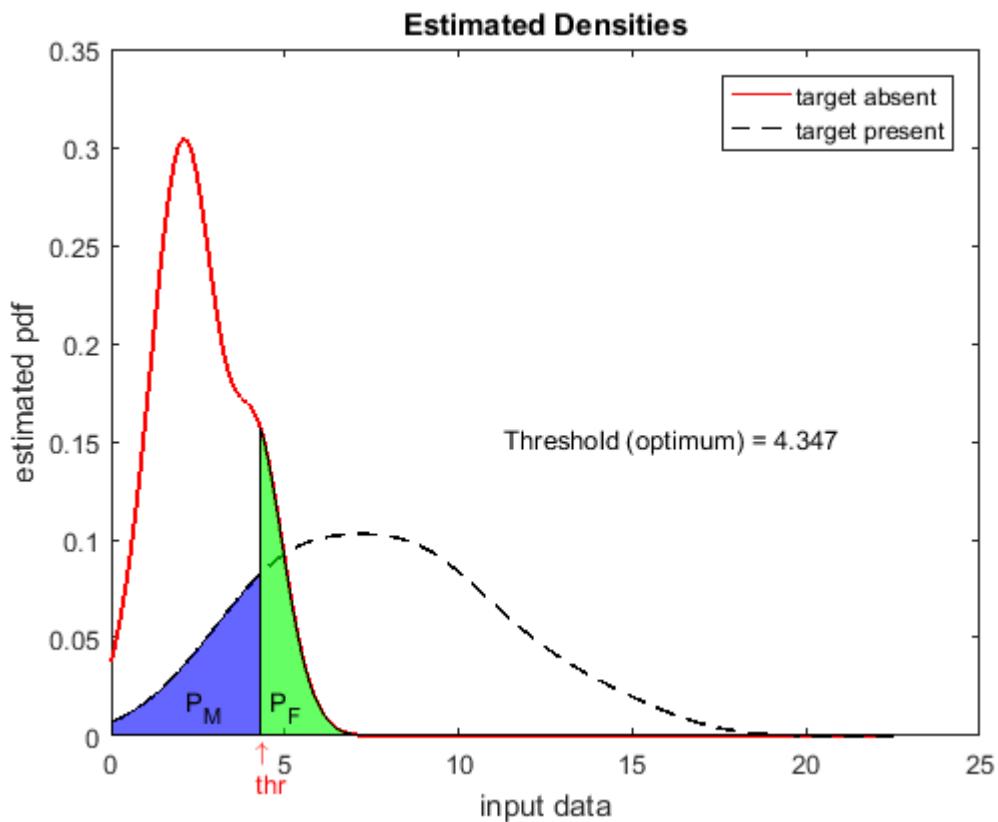
$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{39}{40} & \frac{7}{30} \\ \frac{1}{40} & \frac{23}{30} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.975 & 0.2333 \\ 0.025 & 0.7667 \end{bmatrix}$$

$$P_F = \frac{1}{40} = 0.025 \quad P_M = \frac{7}{30} = 0.2333 \quad \text{PPV} = \frac{23}{24} = 0.95833$$

p m shankar





Confusion Matrix : Threshold (optimum) = 4.347

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	3	37
	Target Present	27	3
	Total Counts	30	40

dist to top left corner of the ROC curve = 0.125

Transition Matrix: Threshold (optimum) = 4.347

$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{37}{40} & \frac{1}{10} \\ \frac{3}{40} & \frac{9}{10} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.925 & 0.1 \\ 0.075 & 0.9 \end{bmatrix}$$

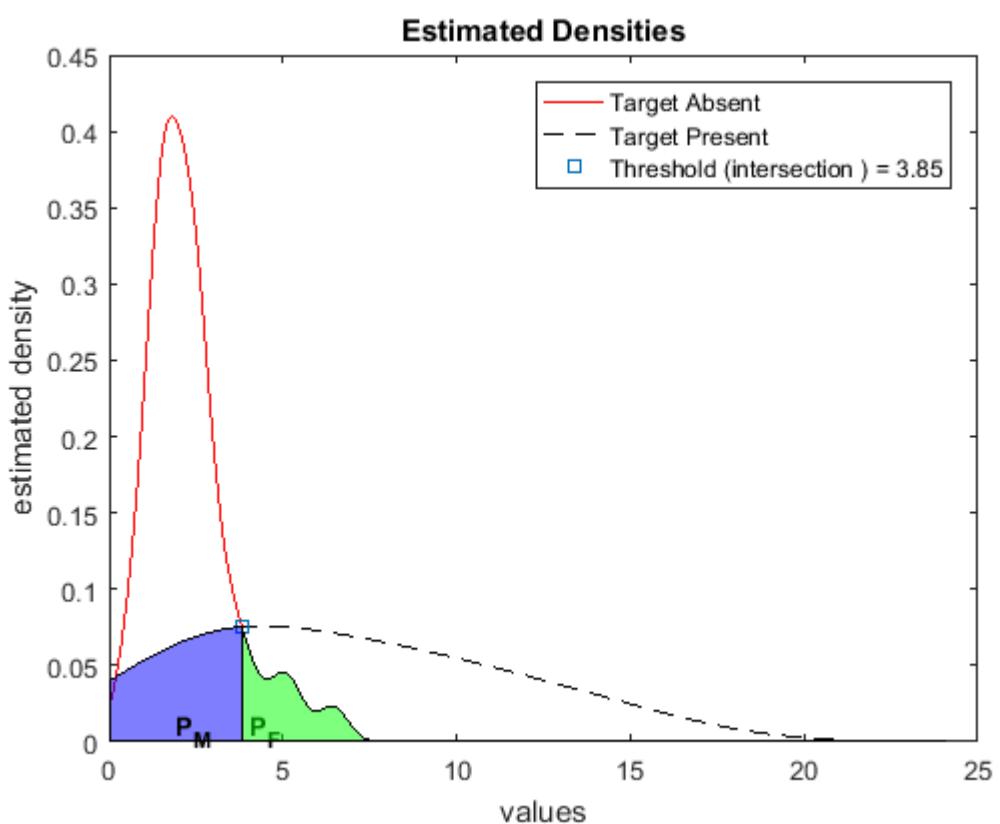
$$P_F = \frac{3}{40} = 0.075 \quad P_M = \frac{1}{10} = 0.1 \quad \text{PPV} = \frac{9}{10} = 0.9$$

p m shankar

data (Dogan)

Target Absent					Target Present				
1.306	1.365	2.555	2.45	6.438	2.488	2.995	6.824	9.965	4.334
0.52	1.132	2.049	2.423	1.632	8.581	14.337	6.822	3.267	12.101
2.896	1.648	0.89	1.909	1.682	4.763	5.714	0.74	4.514	6.935
1.464	5.249	2.556	2.306	1.664	12.886	16.097	13.543	1.949	1.245
2.139	3.485	2.549	1.368	0.693	1.637	1.788	2.761	8.906	10.988
2.876	2.236	3.279	2.06	1.464	3.426	9.922	9.311	7.927	5.251
1.276	3.7	4.134	2.736	1.58					
1.69	1.637	2.395	4.937	2.188					

(c) P. M. Shankar



Confusion Matrix: Threshold (intersection) = 3.85

Data Collected	Target Detected	Target Not Detected	Total Counts
Target Absent	4	36	40
Target Present	20	10	30
Total Counts	24	46	70

Errors circled

dist to top left corner of the ROC curve = 0.348

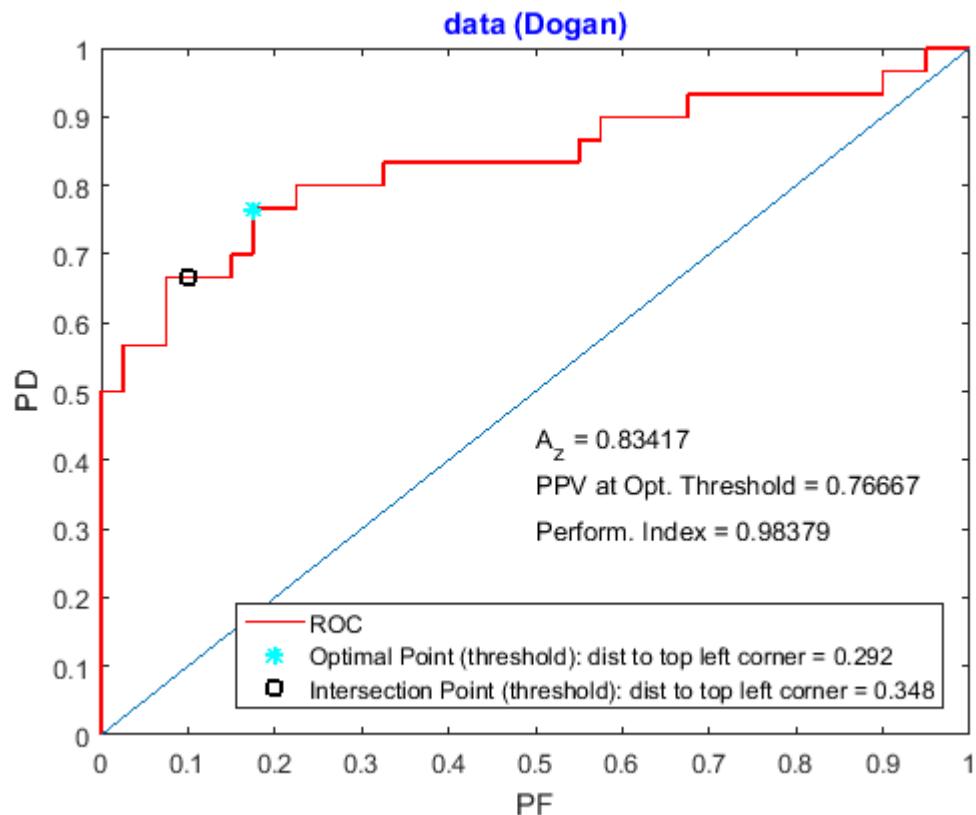
Transition Matrix: Threshold (intersection) = 3.85

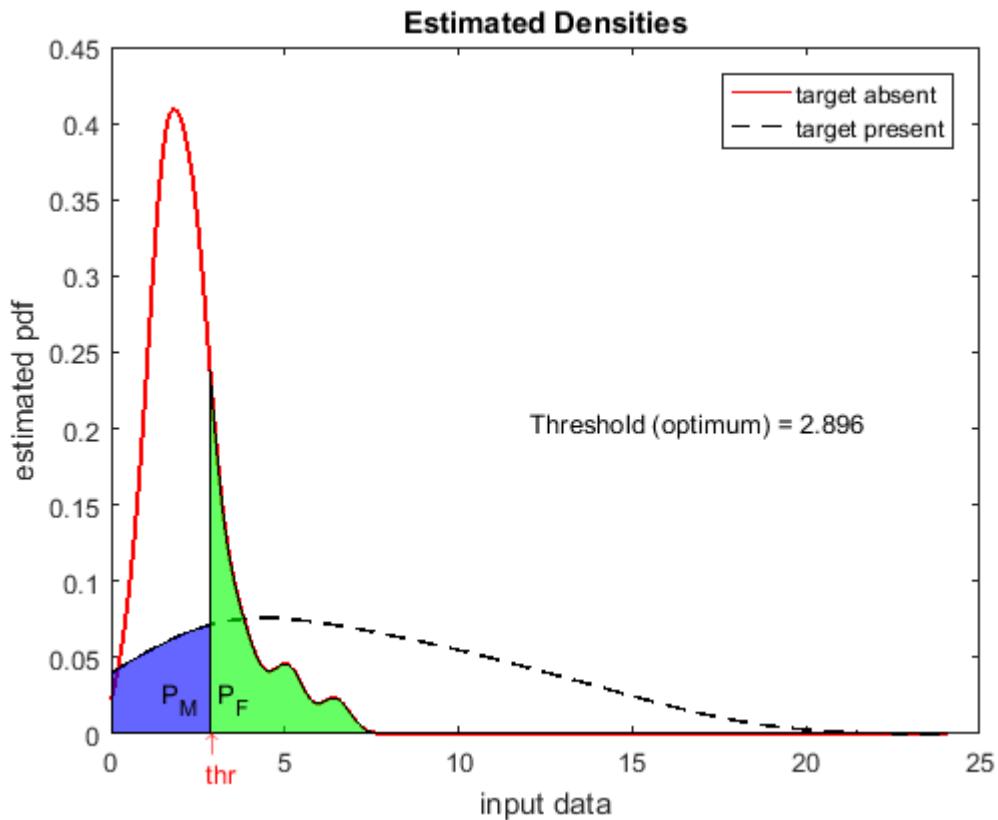
$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{9}{10} & \frac{1}{3} \\ \frac{1}{10} & \frac{2}{3} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.9 & 0.3333 \\ 0.1 & 0.6667 \end{bmatrix}$$

$$P_F = \frac{1}{10} = 0.1 \quad P_M = \frac{1}{3} = 0.33333 \quad \text{PPV} = \frac{5}{6} = 0.83333$$

p m shankar





Confusion Matrix : Threshold (optimum) = 2.896

Data Collected		Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	7	33	40
	Target Present	23	7	30
	Total Counts	30	40	70

dist to top left corner of the ROC curve = 0.292

Transition Matrix: Threshold (optimum) = 2.896

$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{33}{40} & \frac{7}{30} \\ \frac{7}{40} & \frac{23}{30} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.825 & 0.2333 \\ 0.175 & 0.7667 \end{bmatrix}$$

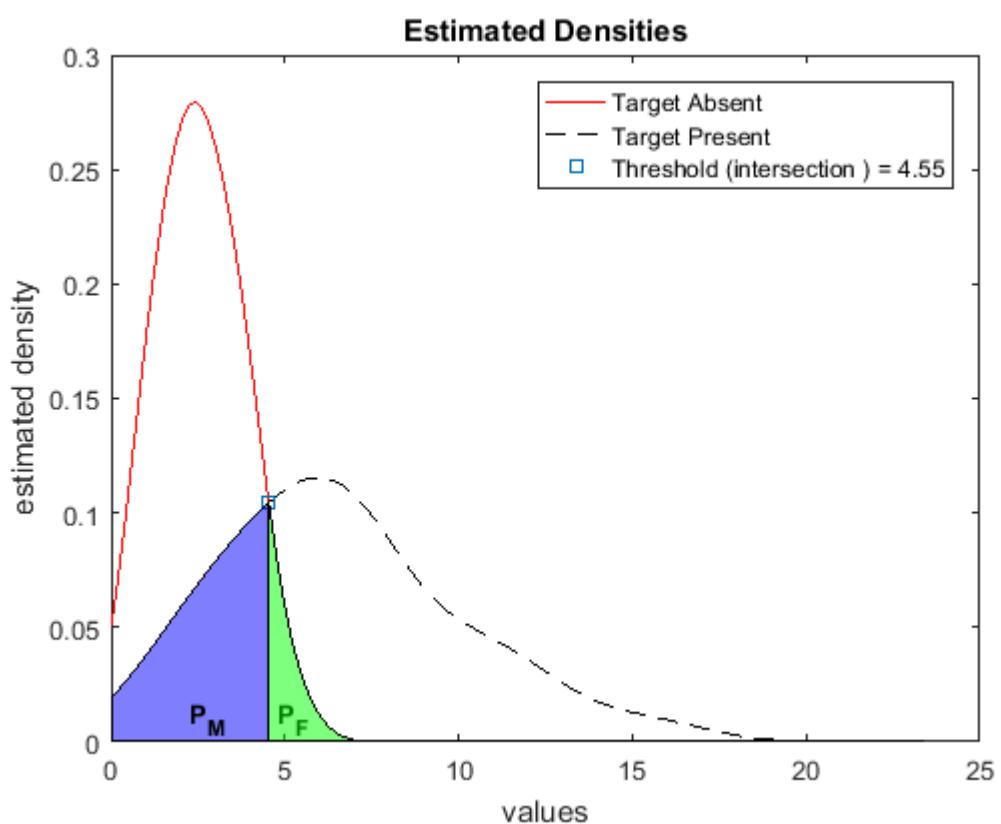
$$P_F = \frac{7}{40} = 0.175 \quad P_M = \frac{7}{30} = 0.2333 \quad \text{PPV} = \frac{23}{30} = 0.76667$$

p m shankar

data (Donatiello)

Target Absent					Target Present				
3.701	3.817	3.467	2.199	2.201	7.218	10.632	4.778	7.063	7.355
1.443	2.152	0.823	0.805	3.443	4.09	11.374	1.815	4.877	7.22
3.466	2.612	2.096	2.503	4.474	3.779	4.641	3.441	15.619	1.97
1.094	5.253	0.789	0.775	1.446	12.884	1.565	4.995	8.189	6.795
3.117	1.359	2.838	2.778	2.69	7.036	11.473	2.245	6.238	6.496
2.159	3.559	1.569	2.344	2.703	9.834	9.484	5.825	3.933	6.289
2.024	1.095	2.219	4.243	4.081					
2.182	3.011	3.964	1.464	3.585					

(c) P. M. Shankar



Confusion Matrix: Threshold (intersection) = 4.55

Data Collected	Target Detected	Target Not Detected	Total Counts
Target Absent	1	39	40
Target Present	22	8	30
Total Counts	23	47	70

dist to top left corner of the ROC curve = 0.268

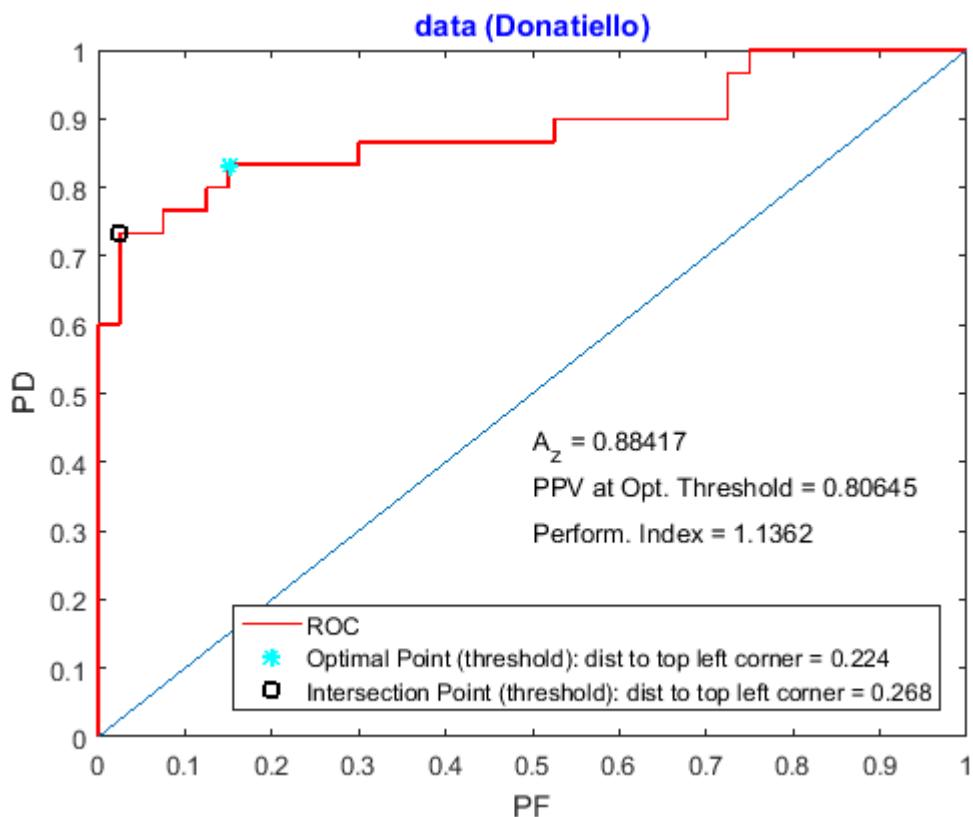
Transition Matrix: Threshold (intersection) = 4.55

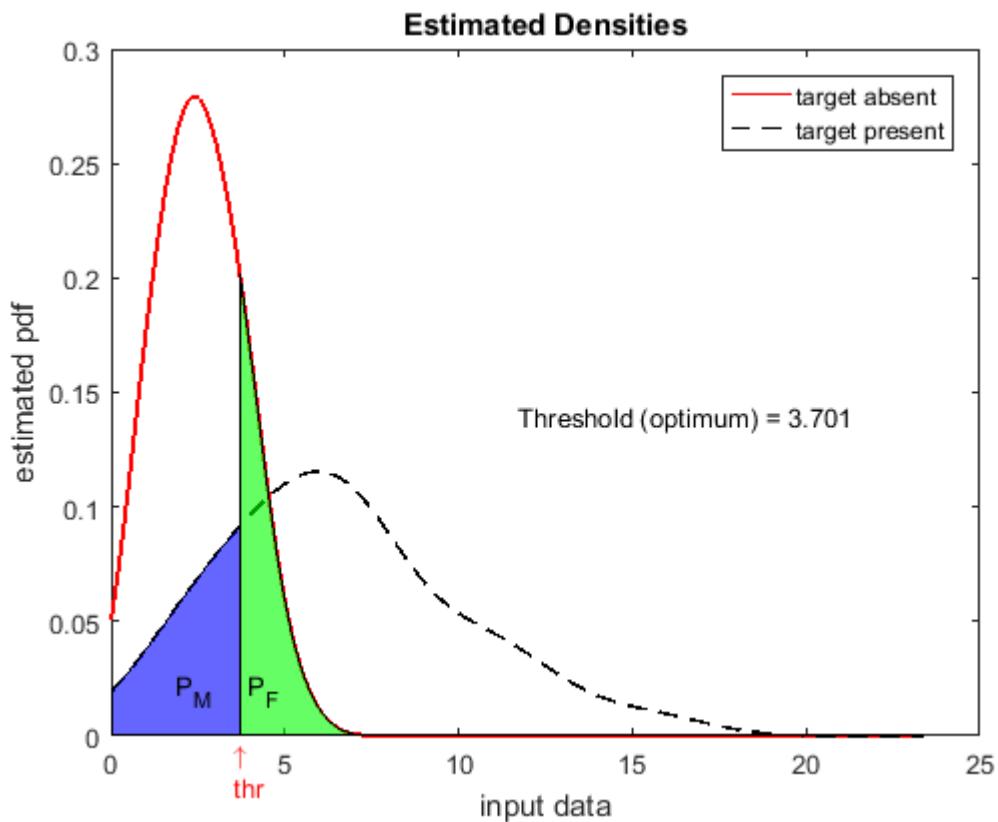
$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{39}{40} & \frac{4}{15} \\ \frac{1}{40} & \frac{11}{15} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.975 & 0.26667 \\ 0.025 & 0.7333 \end{bmatrix}$$

$$P_F = \frac{1}{40} = 0.025 \quad P_M = \frac{4}{15} = 0.26667 \quad \text{PPV} = \frac{22}{23} = 0.95652$$

p m shankar





Confusion Matrix : Threshold (optimum) = 3.701

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	6	34
	Target Present	25	5
	Total Counts	31	39

dist to top left corner of the ROC curve = 0.224

Transition Matrix: Threshold (optimum) = 3.701

$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{17}{20} & \frac{1}{6} \\ \frac{3}{20} & \frac{5}{6} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.85 & 0.1667 \\ 0.15 & 0.8333 \end{bmatrix}$$

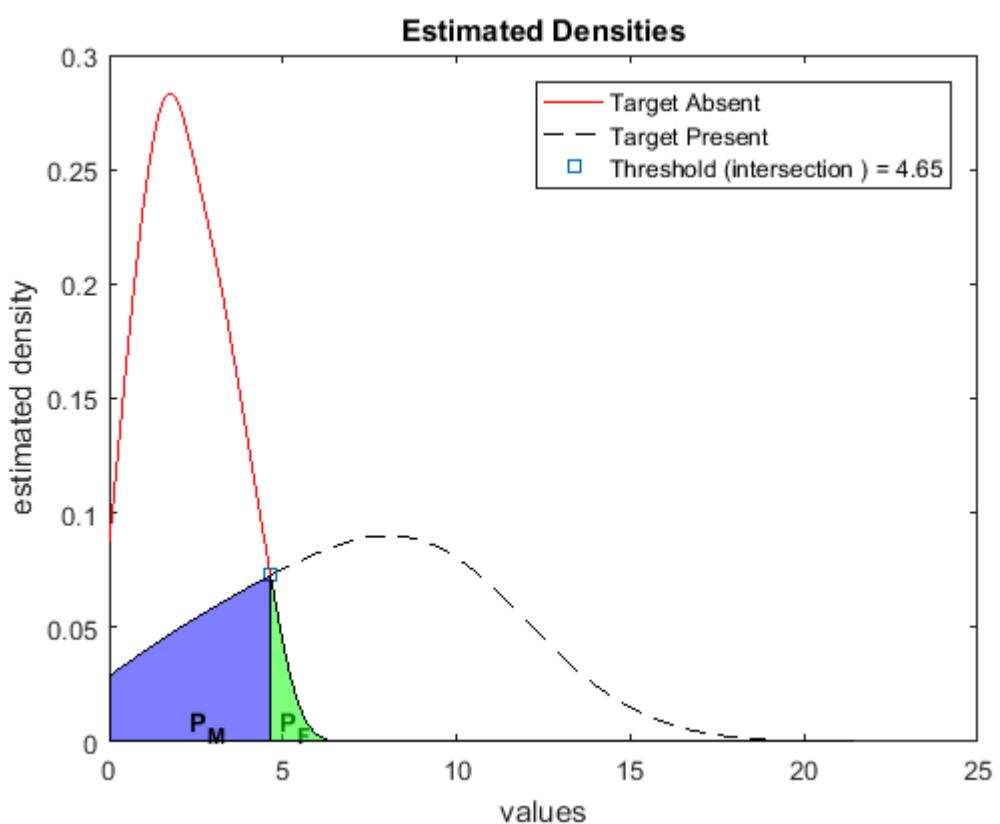
$$P_F = \frac{3}{20} = 0.15 \quad P_M = \frac{1}{6} = 0.16667 \quad \text{PPV} = \frac{25}{31} = 0.80645$$

p m shankar

data (Doyle)

Target Absent					Target Present				
0.399	1.495	2.56	0.667	3.155	10.263	6.457	0.728	0.793	4.292
1.995	4.402	1.653	1.083	4.395	11.268	4.171	8.679	1.132	4.076
0.387	3.093	3.531	1.749	3.505	9.691	8.816	8.631	7.424	7.018
4.541	0.983	0.663	4.148	2.27	11.59	14.313	8.722	5.474	9.544
2.809	0.586	2.657	3.386	3.464	6.476	3.438	5.638	1.651	11.674
2.724	1.802	1.695	1.537	2.239	11.17	6.625	10.017	3.338	7.745
1.588	1.704	1.37	3.425	2.703					
0.853	2.325	1.897	1.566	0.606					

(c) P. M. Shankar



Confusion Matrix: Threshold (intersection) = 4.65

Data Collected	Target Detected	Target Not Detected	Total Counts
Target Absent	0	40	40
Target Present	21	9	30
Total Counts	21	49	70

dist to top left corner of the ROC curve = 0.3

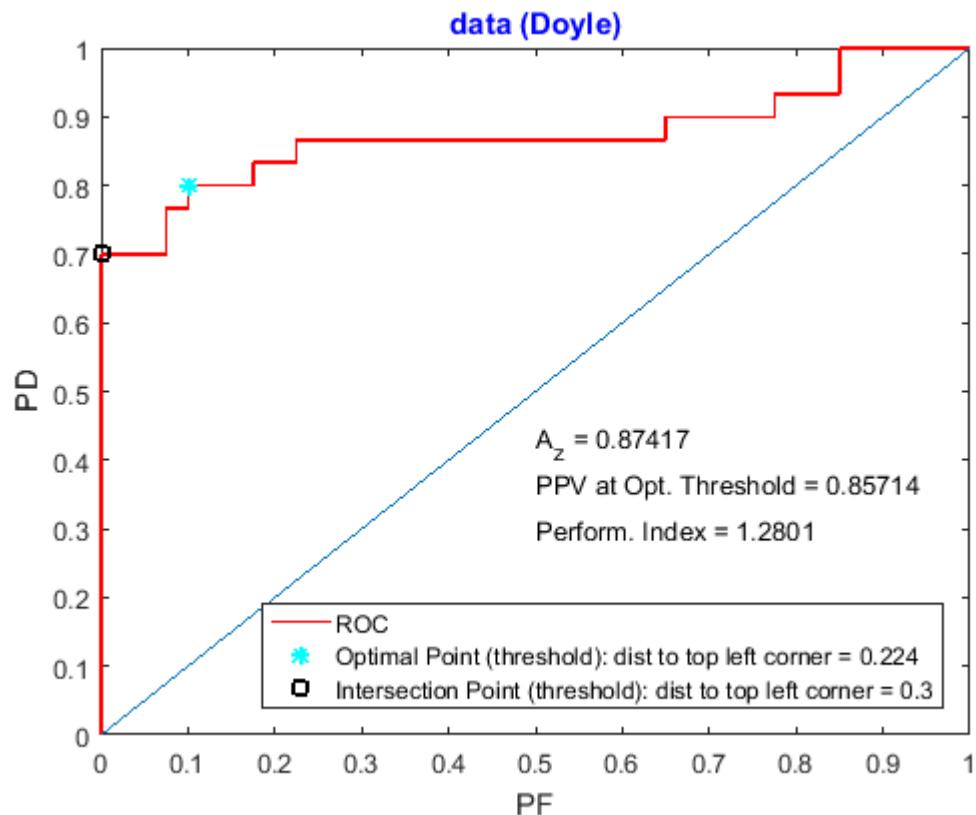
Transition Matrix: Threshold (intersection) = 4.65

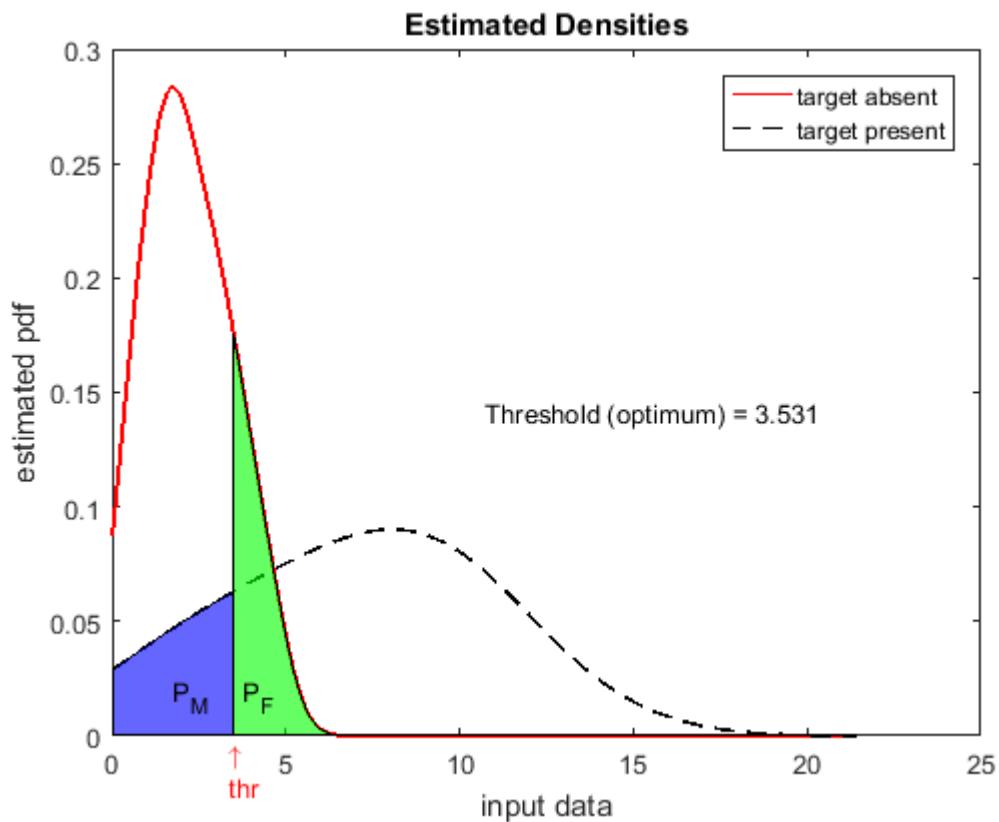
$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} 1 & \frac{3}{10} \\ 0 & \frac{7}{10} \end{bmatrix} \Rightarrow \begin{bmatrix} 1 & 0.3 \\ 0 & 0.7 \end{bmatrix}$$

$$P_F = 0 = 0 \quad P_M = \frac{3}{10} = 0.3 \quad \text{PPV} = 1 = 1$$

p m shankar





Confusion Matrix : Threshold (optimum) = 3.531

Data Collected		Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	4	36	40
	Target Present	24	6	30
	Total Counts	28	42	70

dist to top left corner of the ROC curve = 0.224

Transition Matrix: Threshold (optimum) = 3.531

$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{9}{10} & \frac{1}{5} \\ \frac{1}{10} & \frac{4}{5} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.9 & 0.2 \\ 0.1 & 0.8 \end{bmatrix}$$

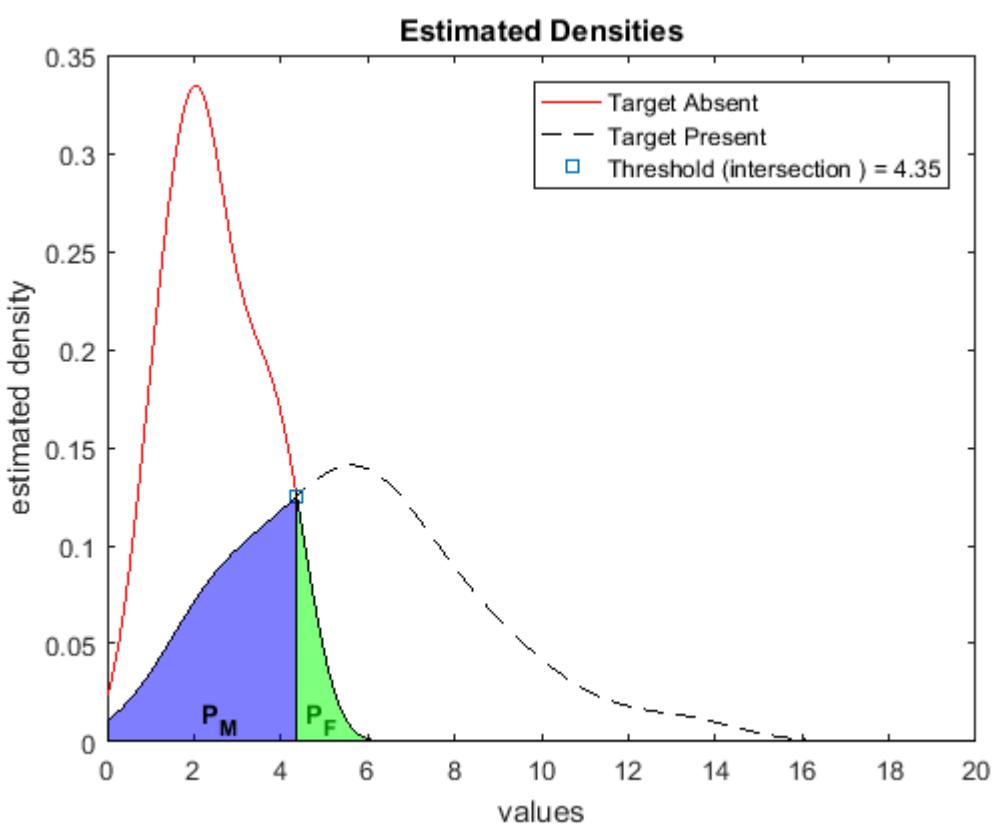
$$P_F = \frac{1}{10} = 0.1 \quad P_M = \frac{1}{5} = 0.2 \quad \text{PPV} = \frac{6}{7} = 0.85714$$

p m shankar

data (Drzewicki)

Target Absent					Target Present				
1.94	2.057	2.248	1.472	4.502	13.353	4.987	2.576	9.12	7.324
1.942	1.219	3.793	3.427	2.249	4.28	5.894	2.764	5.94	8.794
4.203	2.931	4.565	3.756	3.773	9.813	2.333	6.754	6.099	4.123
1.239	3.393	1.033	2.537	1.066	4.97	6.831	3.078	4.992	7.623
2.093	2.041	1.196	3.168	2.699	3.237	5.34	6.952	11.152	6.534
1.649	1.51	2.106	2.908	2.637	5.229	2.059	2.131	5.061	8.401
2.505	0.716	2.286	1.99	3.338					
1.193	1.91	3.897	4.116	1.953					

(c) P. M. Shankar



Confusion Matrix: Threshold (intersection) = 4.35

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	2	38
	Target Present	21	9
	Total Counts	23	47

dist to top left corner of the ROC curve = 0.304

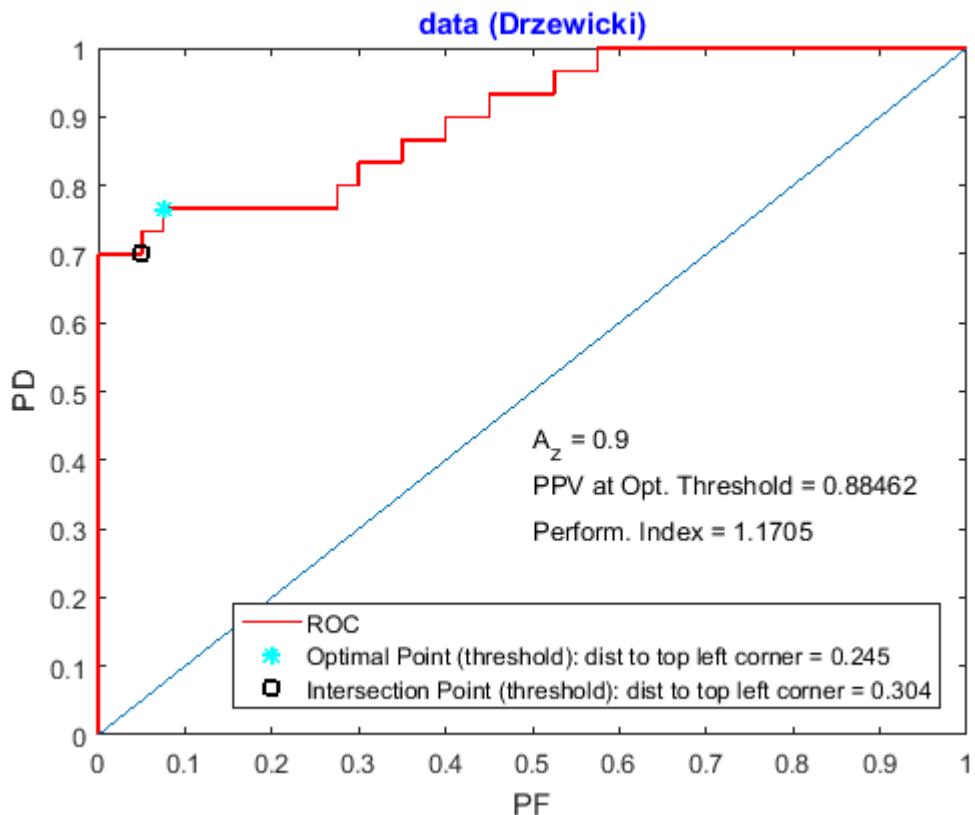
Transition Matrix: Threshold (intersection) = 4.35

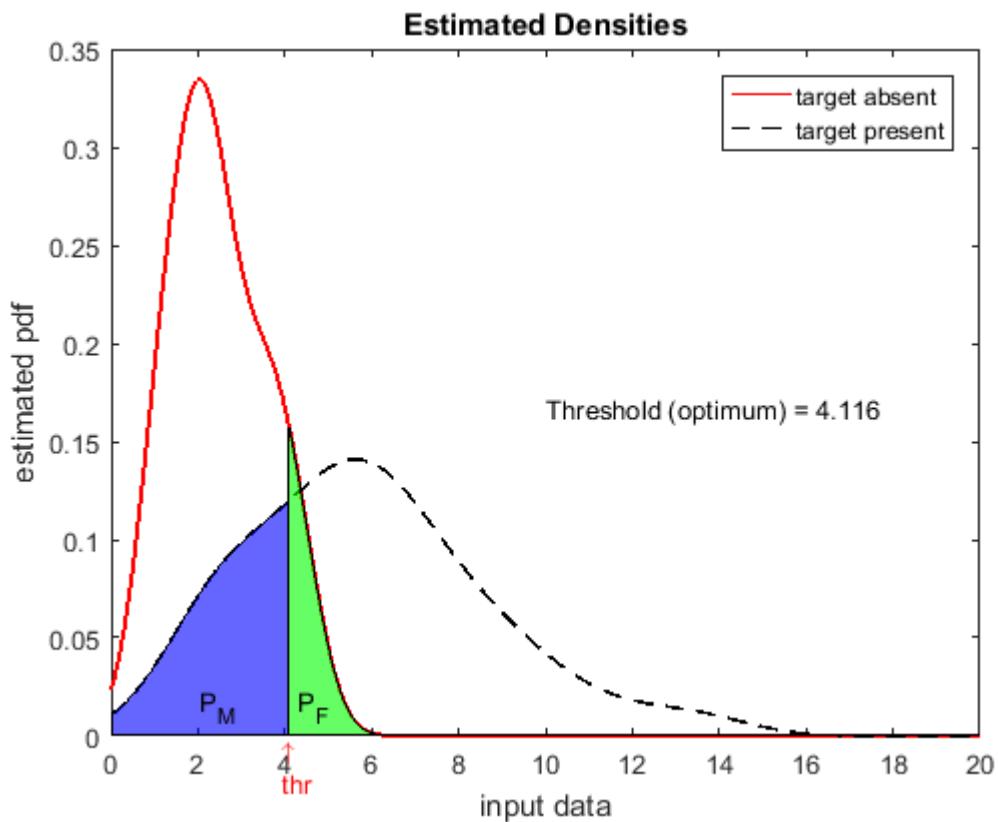
$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{19}{20} & \frac{3}{10} \\ \frac{1}{20} & \frac{7}{10} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.95 & 0.3 \\ 0.05 & 0.7 \end{bmatrix}$$

$$P_F = \frac{1}{20} = 0.05 \quad P_M = \frac{3}{10} = 0.3 \quad \text{PPV} = \frac{21}{23} = 0.91304$$

p m shankar





Confusion Matrix : Threshold (optimum) = 4.116

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	3	37
	Target Present	23	7
	Total Counts	26	44

dist to top left corner of the ROC curve = 0.245

Transition Matrix: Threshold (optimum) = 4.116

$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{37}{40} & \frac{7}{30} \\ \frac{3}{40} & \frac{23}{30} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.925 & 0.2333 \\ 0.075 & 0.7667 \end{bmatrix}$$

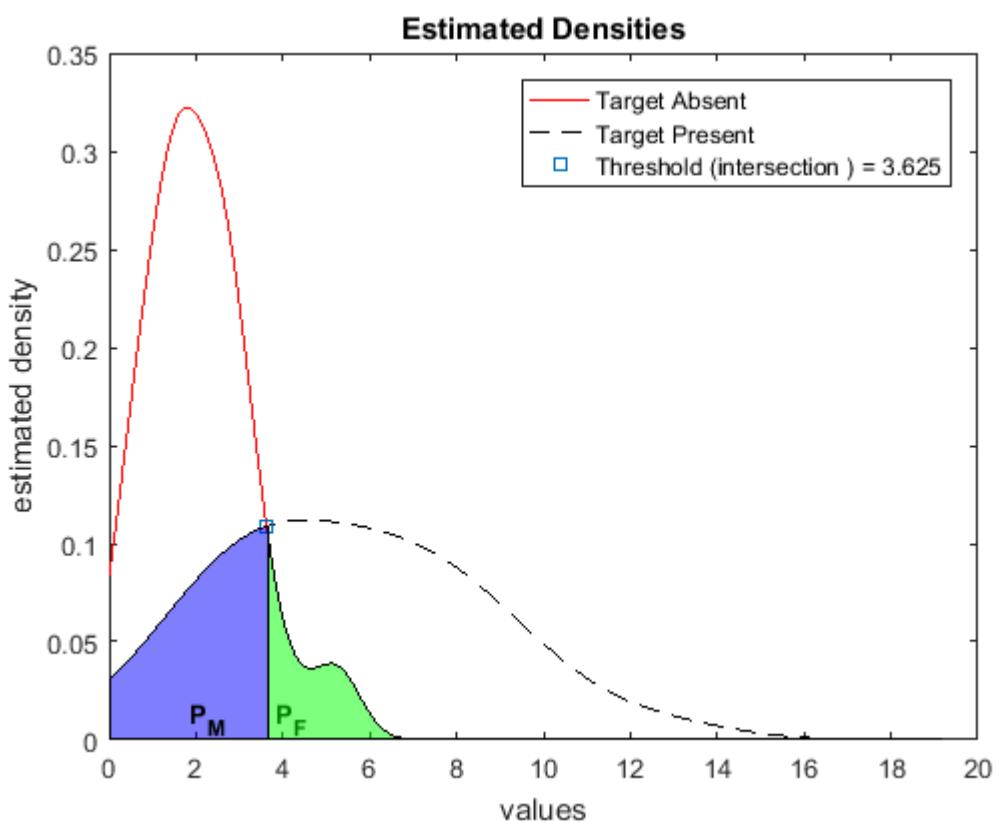
$$P_F = \frac{3}{40} = 0.075 \quad P_M = \frac{7}{30} = 0.2333 \quad \text{PPV} = \frac{23}{26} = 0.88462$$

p m shankar

data (Dunkers)

Target Absent					Target Present				
3.097	1.574	1.357	0.278	1.856	1.924	8.66	5.139	2.979	7.942
1.663	1.597	5.209	0.476	1.512	2.83	7.627	3.478	3.55	3.788
2.637	1.531	1.992	2.478	2.887	7.401	5.983	12.774	10.072	8.797
2.189	2.23	0.348	2.633	2.699	6.385	2.983	6.121	1.914	1.279
1.874	1.052	2.855	0.789	0.859	6.291	10.081	8.53	3.53	4.609
2.537	4.087	0.837	3.052	5.24	4.002	6.1	0.804	4.975	7.072
1.222	0.477	3.428	1.98	3.468					
2.739	1.154	2.342	1.484	1.579					

(c) P. M. Shankar



Confusion Matrix: Threshold (intersection) = 3.625

Data Collected	Target Detected	Target Not Detected	Total Counts
Target Absent	3	37	40
Target Present	20	10	30
Total Counts	23	47	70

Errors circled

dist to top left corner of the ROC curve = 0.342

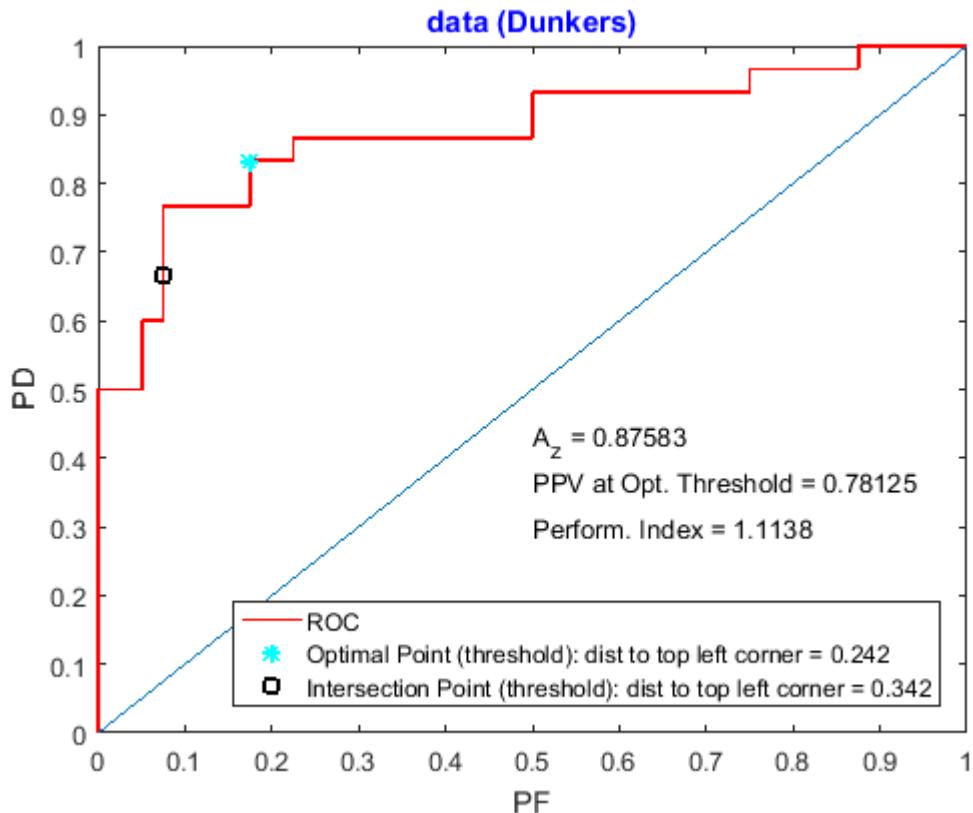
Transition Matrix: Threshold (intersection) = 3.625

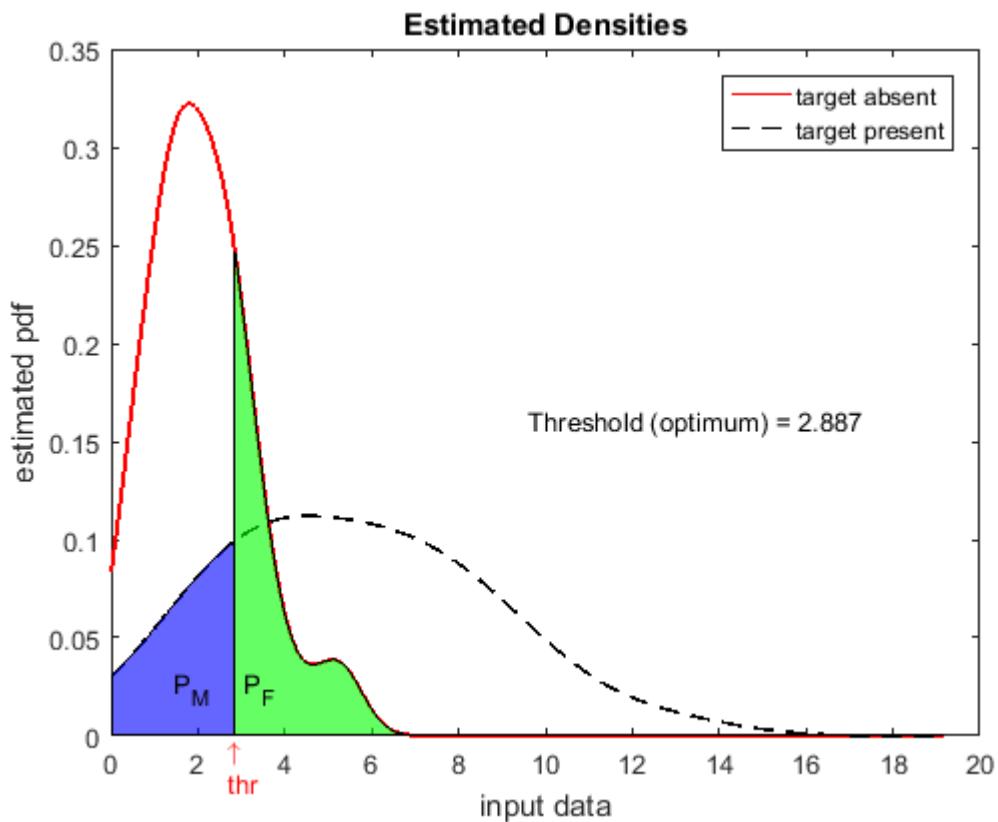
$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{37}{40} & \frac{1}{3} \\ \frac{3}{40} & \frac{2}{3} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.925 & 0.3333 \\ 0.075 & 0.6667 \end{bmatrix}$$

$$P_F = \frac{3}{40} = 0.075 \quad P_M = \frac{1}{3} = 0.33333 \quad \text{PPV} = \frac{20}{23} = 0.86957$$

p m shankar





Confusion Matrix : Threshold (optimum) = 2.887

Data Collected		Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	7	33	40
	Target Present	25	5	30
	Total Counts	32	38	70

dist to top left corner of the ROC curve = 0.242

Transition Matrix: Threshold (optimum) = 2.887

$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{33}{40} & \frac{1}{6} \\ \frac{7}{40} & \frac{5}{6} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.825 & 0.1667 \\ 0.175 & 0.8333 \end{bmatrix}$$

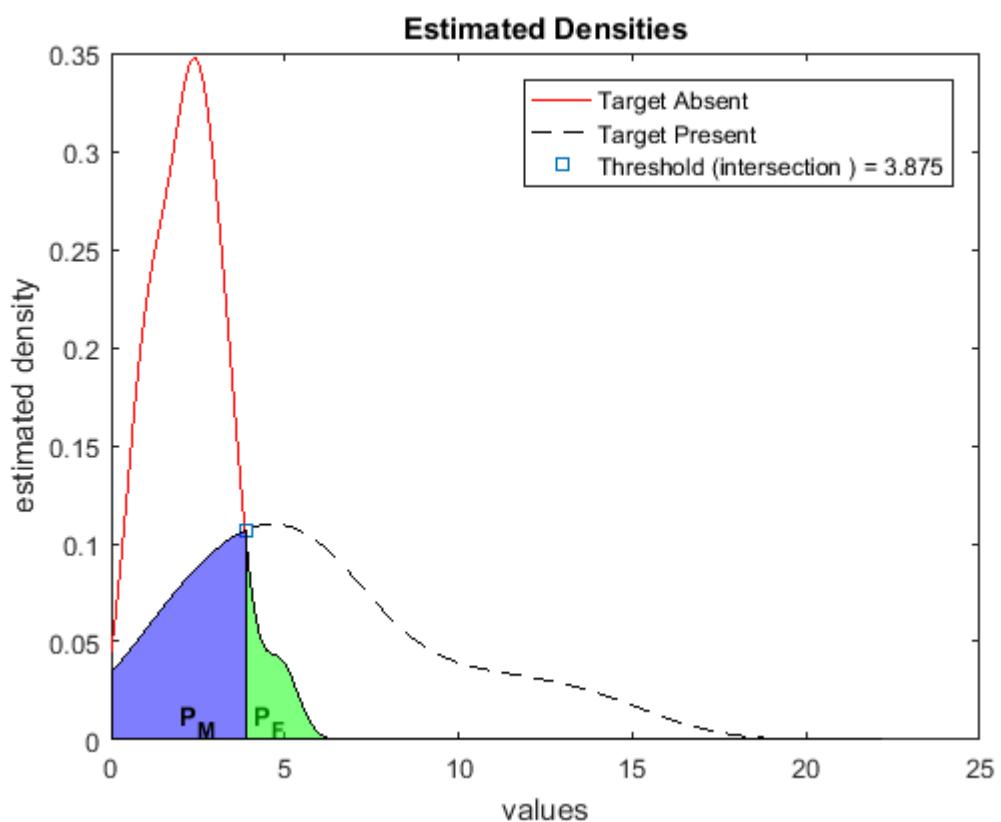
$$P_F = \frac{7}{40} = 0.175 \quad P_M = \frac{1}{6} = 0.16667 \quad \text{PPV} = \frac{25}{32} = 0.78125$$

p m shankar

data (Dunlap)

Target Absent					Target Present				
3.238	2.888	1.837	2.946	2.394	0.929	4.24	9.76	5.433	2.973
0.68	2.447	1.446	3.495	2.287	2.457	5.175	14.773	2.057	2.863
3.698	2.27	3.517	4.729	1.132	13.759	6.088	8.985	5.326	5.3
2.744	4.983	2.309	2.522	0.741	7.134	12.509	2.644	2.746	6.068
1.25	2.349	3.416	3.219	1.687	6.662	4.646	7.262	5.845	5.221
2.054	2.965	2.863	0.93	1.106	4.223	1.012	10.491	11.595	2.449
1.837	1.453	2.518	1.024	0.394					
1.779	0.786	1.765	2.278	2.617					

(c) P. M. Shankar



Confusion Matrix: Threshold (intersection) = 3.875

Data Collected	Target Detected	Target Not Detected	Total Counts
Target Absent	2	38	40
Target Present	21	9	30
Total Counts	23	47	70

dist to top left corner of the ROC curve = 0.304

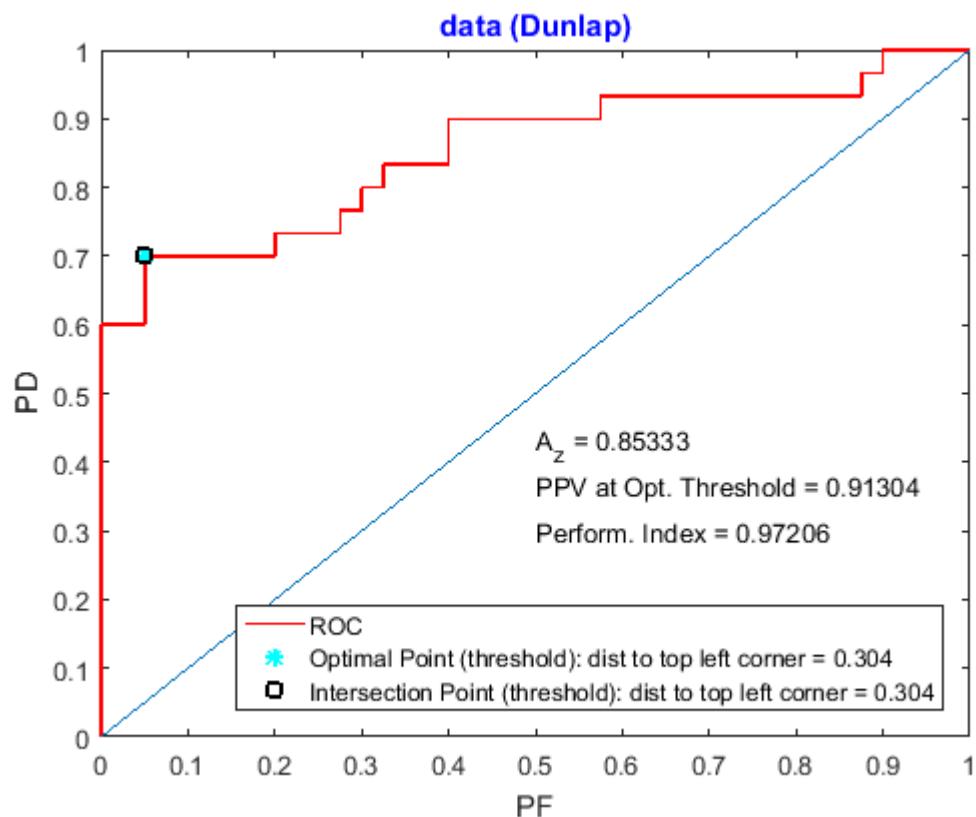
Transition Matrix: Threshold (intersection) = 3.875

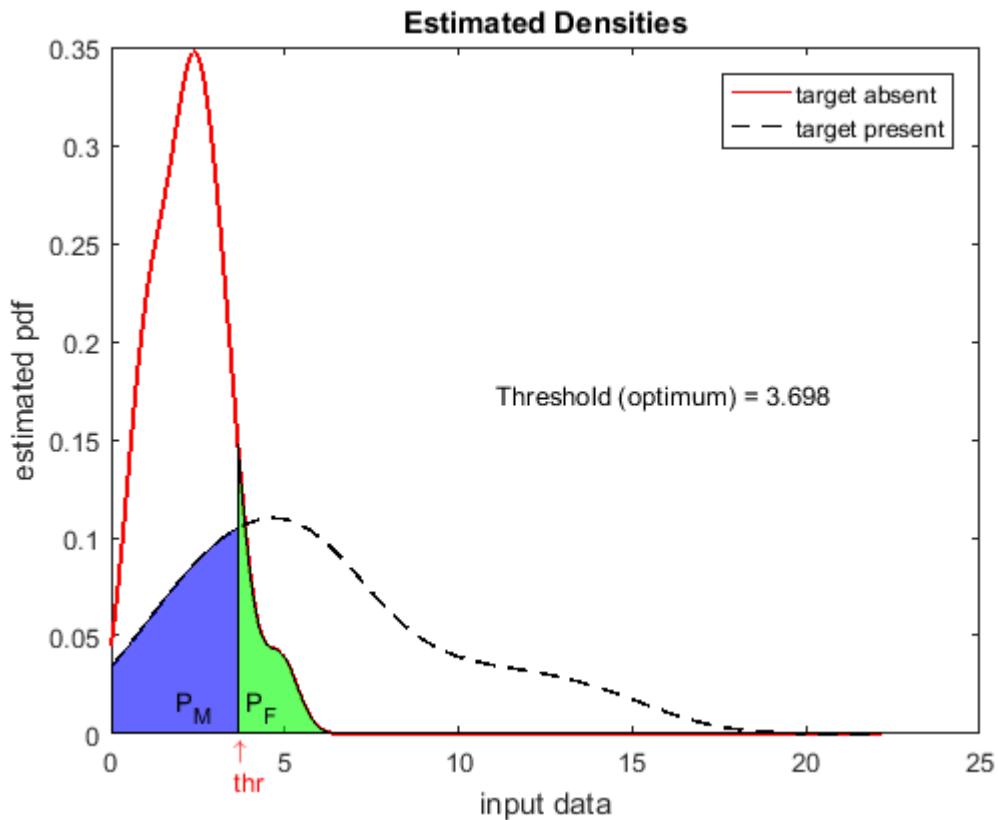
$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{19}{20} & \frac{3}{10} \\ \frac{1}{20} & \frac{7}{10} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.95 & 0.3 \\ 0.05 & 0.7 \end{bmatrix}$$

$$P_F = \frac{1}{20} = 0.05 \quad P_M = \frac{3}{10} = 0.3 \quad \text{PPV} = \frac{21}{23} = 0.91304$$

p m shankar





Confusion Matrix : Threshold (optimum) = 3.698

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	2	38
	Target Present	21	9
	Total Counts	23	47

dist to top left corner of the ROC curve = 0.304

Transition Matrix: Threshold (optimum) = 3.698

$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{19}{20} & \frac{3}{10} \\ \frac{1}{20} & \frac{7}{10} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.95 & 0.3 \\ 0.05 & 0.7 \end{bmatrix}$$

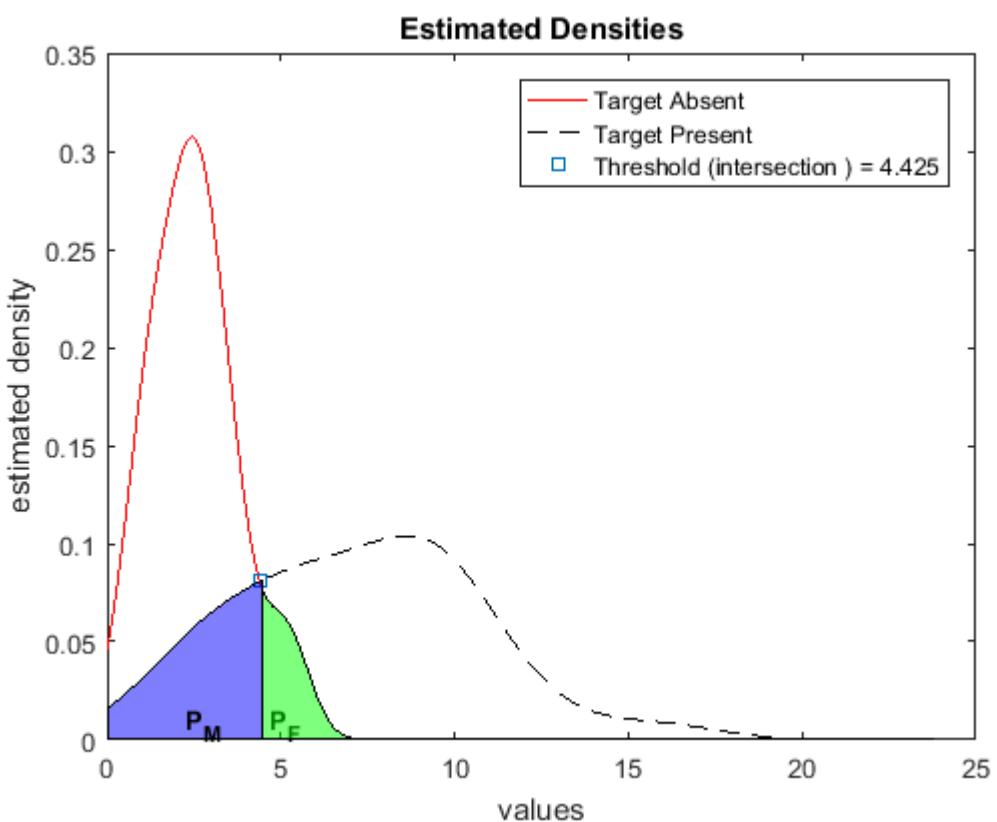
$$P_F = \frac{1}{20} = 0.05 \quad P_M = \frac{3}{10} = 0.3 \quad \text{PPV} = \frac{21}{23} = 0.91304$$

p m shankar

data (Dwyer)

Target Absent					Target Present				
3.065	3.522	0.976	0.981	4.668	9.323	2.562	3.137	9.765	5.872
3.687	1.891	2.678	1.49	2.762	2.873	3.31	10.29	8.722	6.553
2.139	5.336	1.393	3.662	5.343	10.466	7.074	5.576	15.871	10.441
2.612	0.939	1.822	2.581	2.28	8.966	4.988	5.516	1.411	7.612
2.974	1.297	2.338	2.285	3.043	6.268	4.661	10.231	8.287	2.538
0.23	3.512	1.243	1.131	2.25	8.932	5.321	9.158	8.892	12.583
2.465	3.259	2.734	0.897	1.895					
4.965	3.565	2.604	1.585	2.43					

(c) P. M. Shankar



Confusion Matrix: Threshold (intersection) = 4.425

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	4	36
	Target Present	24	6
	Total Counts	28	42

dist to top left corner of the ROC curve = 0.224

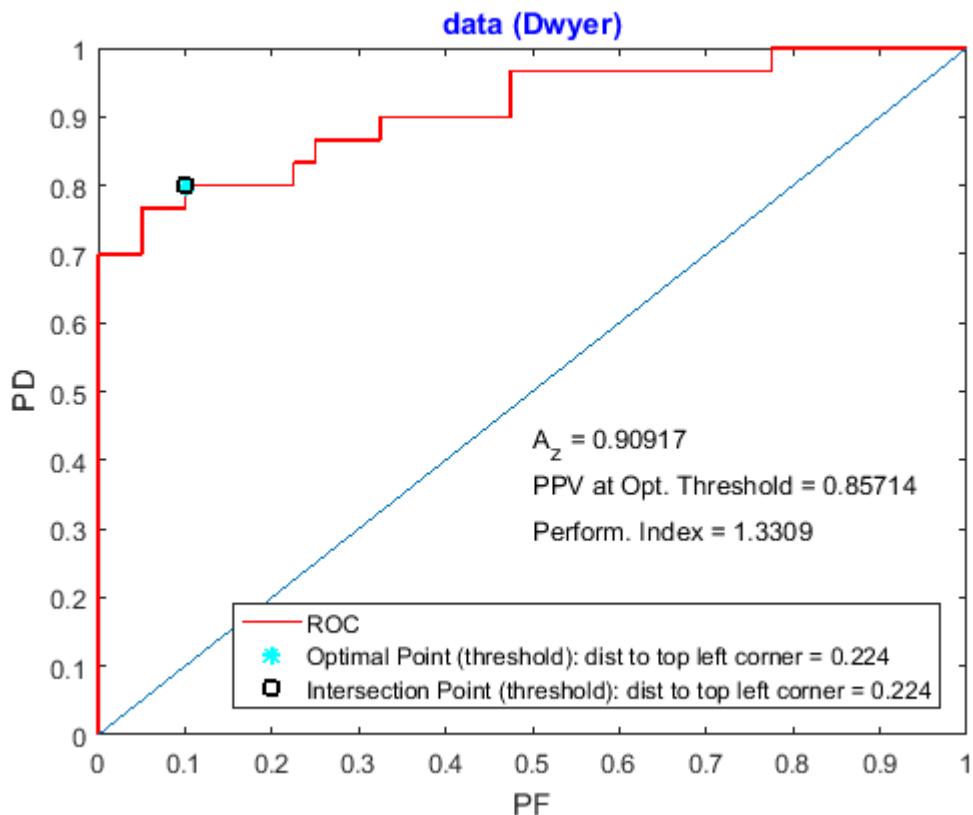
Transition Matrix: Threshold (intersection) = 4.425

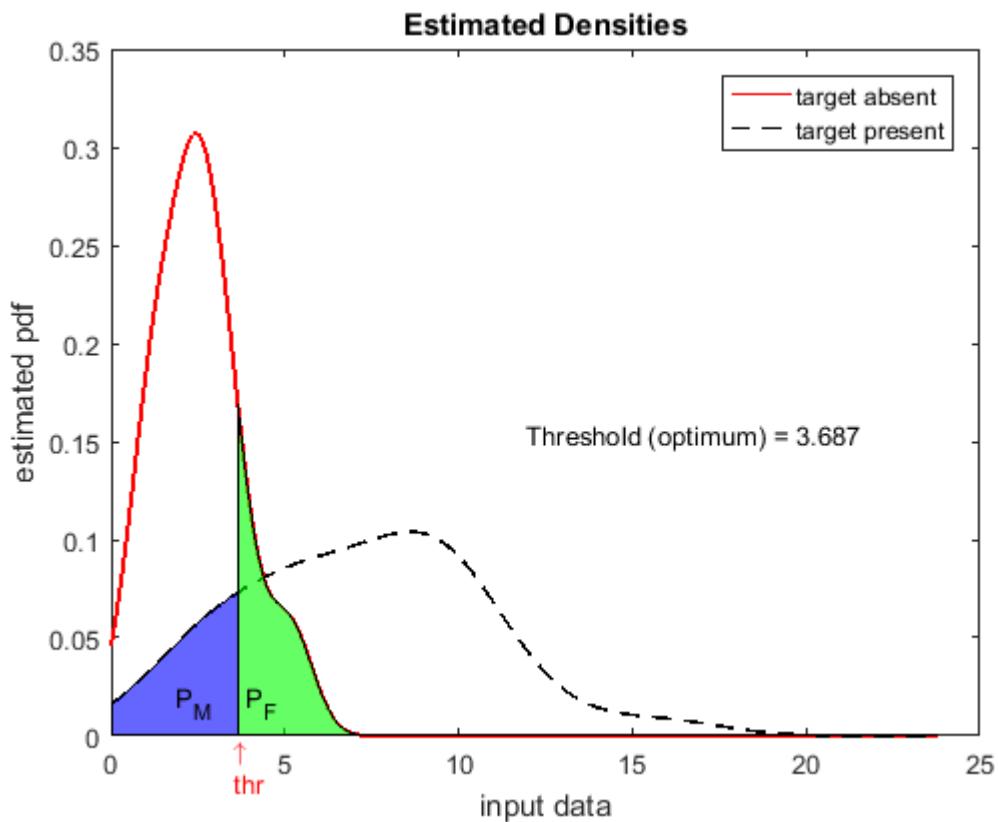
$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{9}{10} & \frac{1}{5} \\ \frac{1}{10} & \frac{4}{5} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.9 & 0.2 \\ 0.1 & 0.8 \end{bmatrix}$$

$$P_F = \frac{1}{10} = 0.1 \quad P_M = \frac{1}{5} = 0.2 \quad \text{PPV} = \frac{6}{7} = 0.85714$$

p m shankar





Confusion Matrix : Threshold (optimum) = 3.687

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	4	36
	Target Present	24	6
	Total Counts	28	42

dist to top left corner of the ROC curve = 0.224

Transition Matrix: Threshold (optimum) = 3.687

$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{9}{10} & \frac{1}{5} \\ \frac{1}{10} & \frac{4}{5} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.9 & 0.2 \\ 0.1 & 0.8 \end{bmatrix}$$

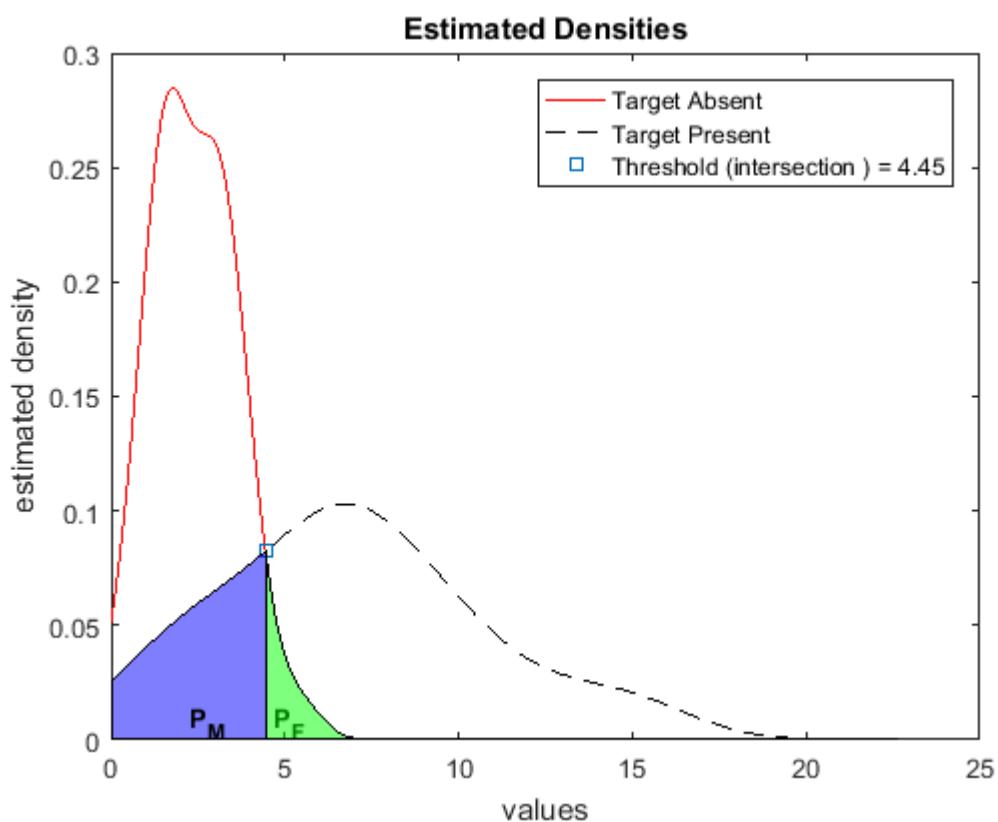
$$P_F = \frac{1}{10} = 0.1 \quad P_M = \frac{1}{5} = 0.2 \quad \text{PPV} = \frac{6}{7} = 0.85714$$

p m shankar

data (Eelman)

Target Absent					Target Present				
2.682	2.6	3.414	3.104	0.282	4.718	6.35	2.663	9.737	11.54
3.296	3.605	3.944	1.869	1.266	5.907	5.657	1.133	6.809	13.203
3.084	5.426	3.592	2.487	3.012	14.886	7.932	9.893	2.407	2.642
2.65	4.291	2.988	1.243	1.406	15.101	6.263	6.754	8.583	0.946
1.687	1.742	1.959	1.494	1.484	5.783	7.609	6.782	4.553	2.144
1.286	2.915	1.04	2.136	1.493	10.347	7.896	4.096	7.419	9.291
1.741	1.423	0.431	4.121	3.185					
3.427	0.853	1.934	3.207	1.741					

(c) P. M. Shankar



Confusion Matrix: Threshold (intersection) = 4.45

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	1	39
	Target Present	23	7
	Total Counts	24	46

dist to top left corner of the ROC curve = 0.235

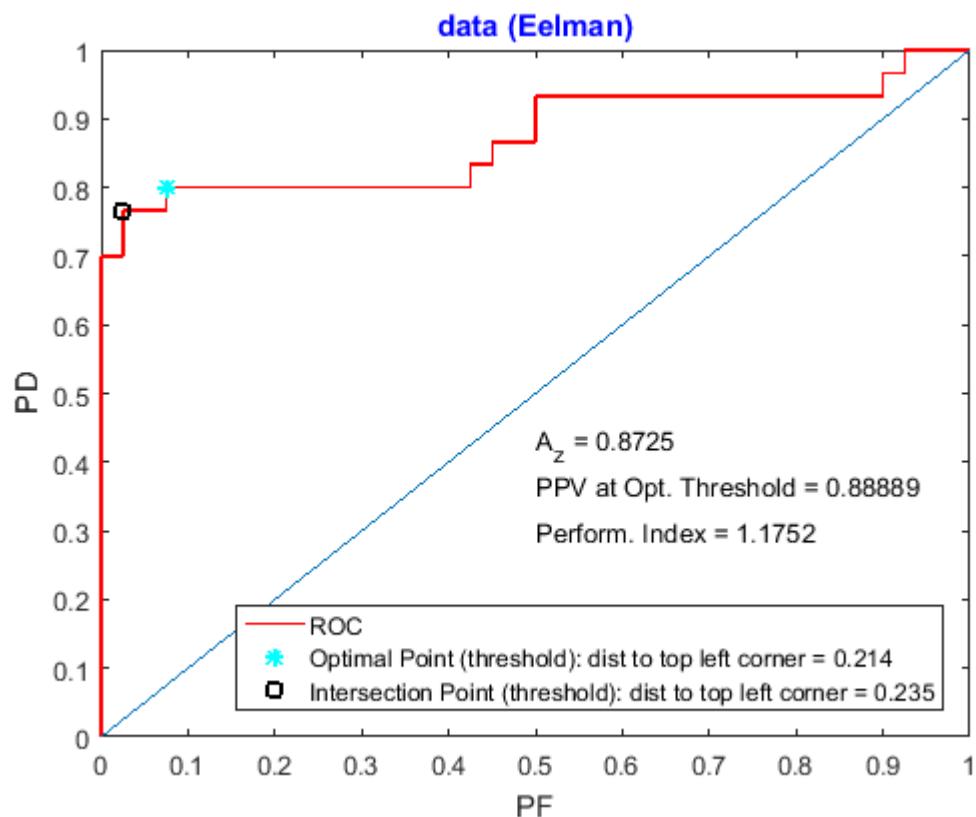
Transition Matrix: Threshold (intersection) = 4.45

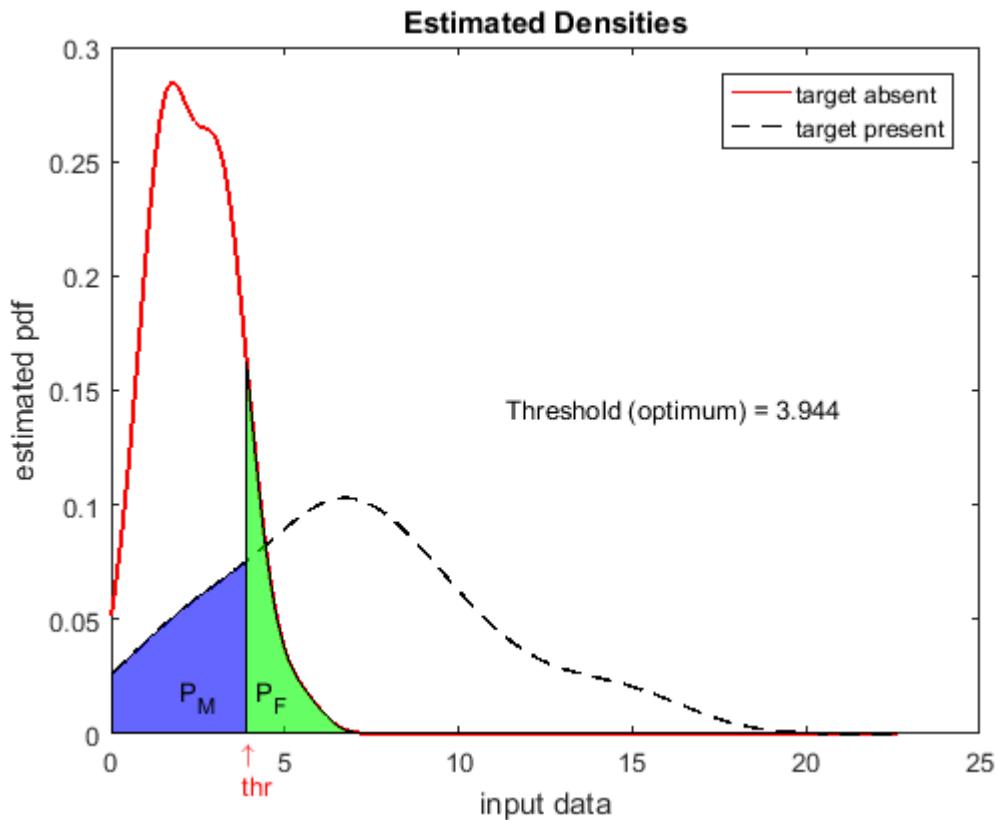
$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{39}{40} & \frac{7}{30} \\ \frac{1}{40} & \frac{23}{30} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.975 & 0.2333 \\ 0.025 & 0.7667 \end{bmatrix}$$

$$P_F = \frac{1}{40} = 0.025 \quad P_M = \frac{7}{30} = 0.23333 \quad \text{PPV} = \frac{23}{24} = 0.95833$$

p m shankar





Confusion Matrix : Threshold (optimum) = 3.944

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	3	37
	Target Present	24	6
	Total Counts	27	43

dist to top left corner of the ROC curve = 0.214

Transition Matrix: Threshold (optimum) = 3.944

$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{37}{40} & \frac{1}{5} \\ \frac{3}{40} & \frac{4}{5} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.925 & 0.2 \\ 0.075 & 0.8 \end{bmatrix}$$

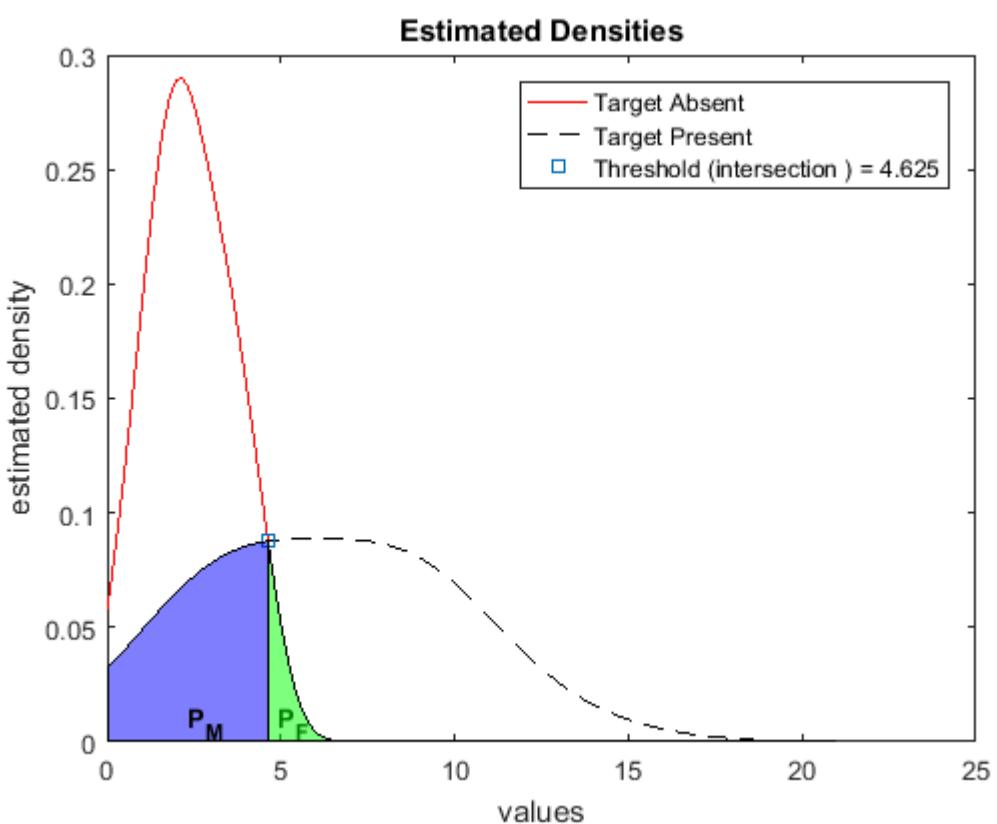
$$P_F = \frac{3}{40} = 0.075 \quad P_M = \frac{1}{5} = 0.2 \quad \text{PPV} = \frac{8}{9} = 0.88889$$

p m shankar

data (Gabel)

Target Absent					Target Present				
0.601	2.666	3.194	0.456	0.432	9.216	1.619	5.338	5.225	5.948
2.245	2.32	4.584	3.295	3.8	3.344	9.669	9.735	2.314	13.97
3.4	3.012	1.25	1.729	1.885	2.635	5.24	3.009	7.238	8.41
1.4	2.394	4.5	2.669	0.968	9.406	2.684	1.986	3.238	4.615
1.305	4.11	0.937	3.13	3.811	10.468	8.916	6.251	2.452	7.412
3.493	1.311	2.637	4.353	1.535	9.221	10.954	7.663	8.632	4.19
1.712	3.673	1.844	2.094	2.079					
3.218	2.242	2.168	2.174	1.744					

(c) P. M. Shankar



Confusion Matrix: Threshold (intersection) = 4.625

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	0	40
	Target Present	19	11
	Total Counts	19	51

dist to top left corner of the ROC curve = 0.367

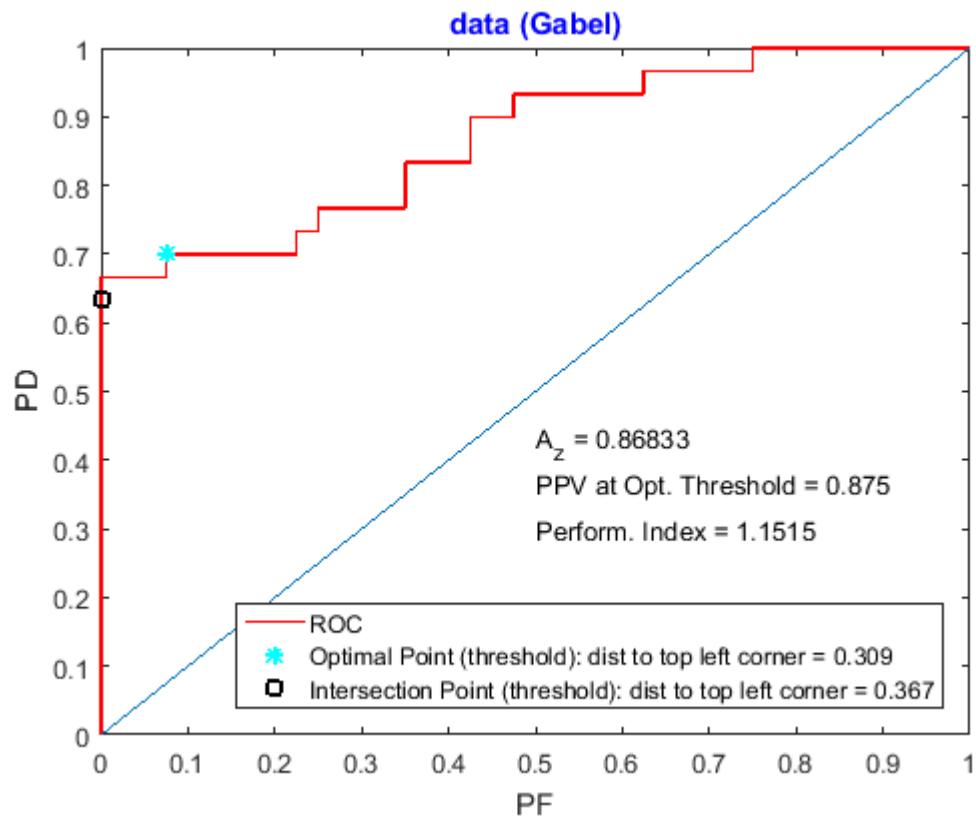
Transition Matrix: Threshold (intersection) = 4.625

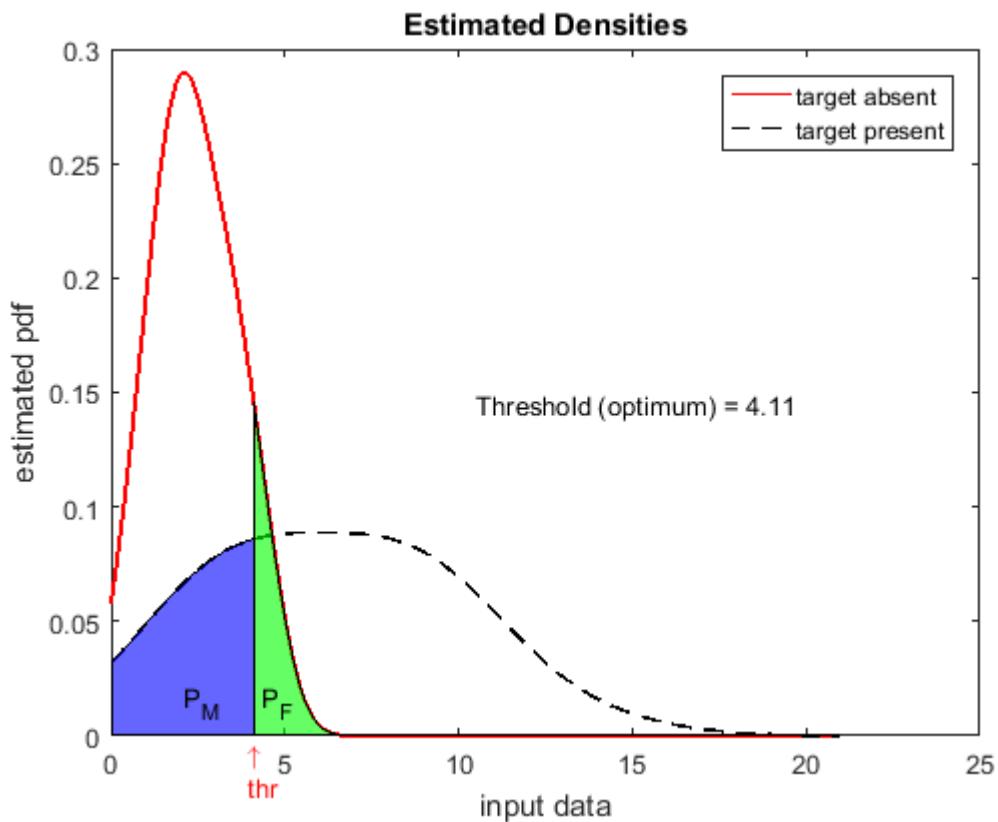
$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} 1 & \frac{11}{30} \\ 0 & \frac{19}{30} \end{bmatrix} \Rightarrow \begin{bmatrix} 1 & 0.36667 \\ 0 & 0.63333 \end{bmatrix}$$

$$P_F = 0 = 0 \quad P_M = \frac{11}{30} = 0.36667 \quad \text{PPV} = 1 = 1$$

p m shankar





Confusion Matrix : Threshold (optimum) = 4.11

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	3	37
	Target Present	21	9
	Total Counts	24	46

dist to top left corner of the ROC curve = 0.309

Transition Matrix: Threshold (optimum) = 4.11

$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{37}{40} & \frac{3}{10} \\ \frac{3}{40} & \frac{7}{10} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.925 & 0.3 \\ 0.075 & 0.7 \end{bmatrix}$$

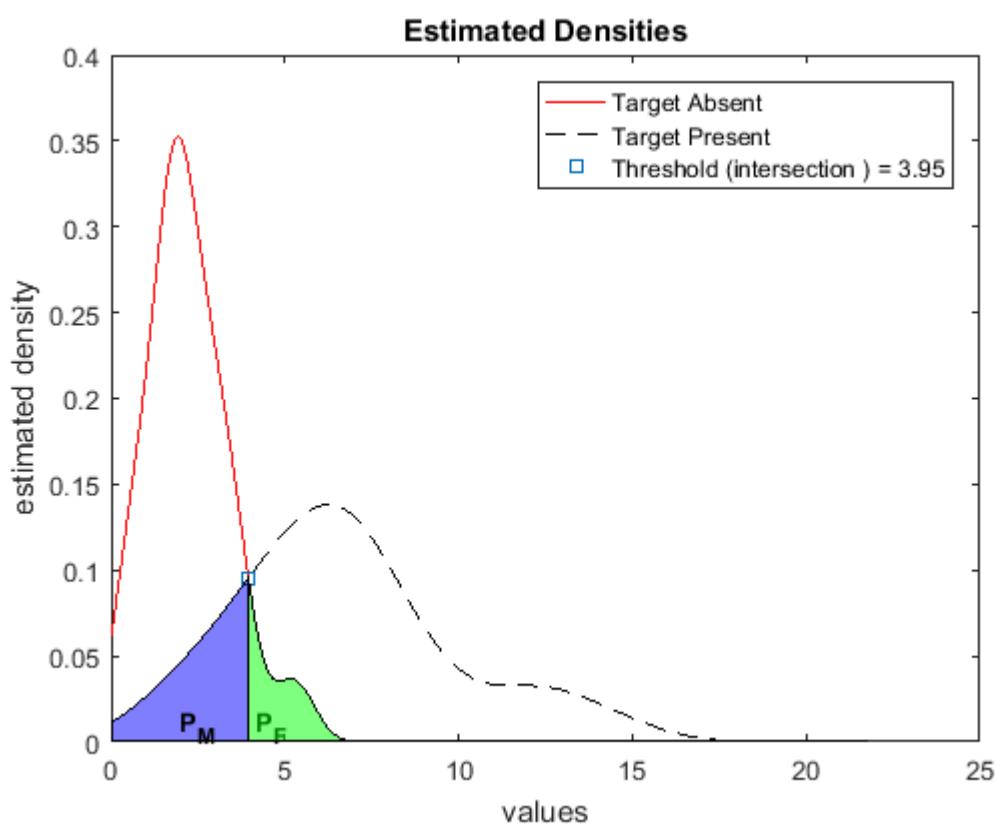
$$P_F = \frac{3}{40} = 0.075 \quad P_M = \frac{3}{10} = 0.3 \quad \text{PPV} = \frac{7}{8} = 0.875$$

p m shankar

data (Gallagher)

Target Absent					Target Present				
3.53	1.88	1.52	2.922	1.77	12.076	12.964	6.8	5.394	14.512
2.397	1.663	1.916	0.427	2.016	6.673	6.728	11.809	6.098	3.058
3.992	3.324	1.513	0.813	0.567	3.676	4.225	7.209	9.17	6.252
1.519	1.913	2.888	1.456	0.808	5.505	5.258	7.03	1.493	4.511
5.046	0.29	1.668	2.038	0.832	8.261	1.885	6.242	7.352	4.974
2.782	2.051	2.379	2.301	3.385	8.15	3.073	7.648	4.564	9.707
2.832	3.688	1.079	1.563	5.489					
2.203	2.798	1.914	2.665	3.435					

(c) P. M. Shankar



Confusion Matrix: Threshold (intersection) = 3.95

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	3	37
	Target Present	25	5
	Total Counts	28	42

dist to top left corner of the ROC curve = 0.183

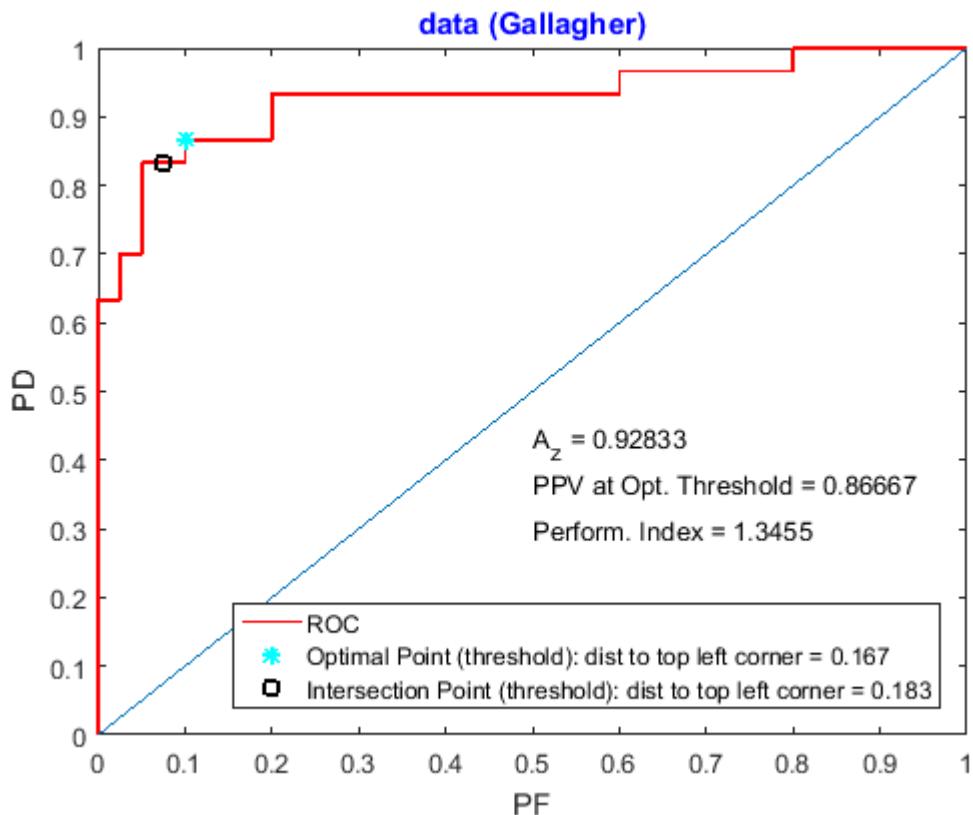
Transition Matrix: Threshold (intersection) = 3.95

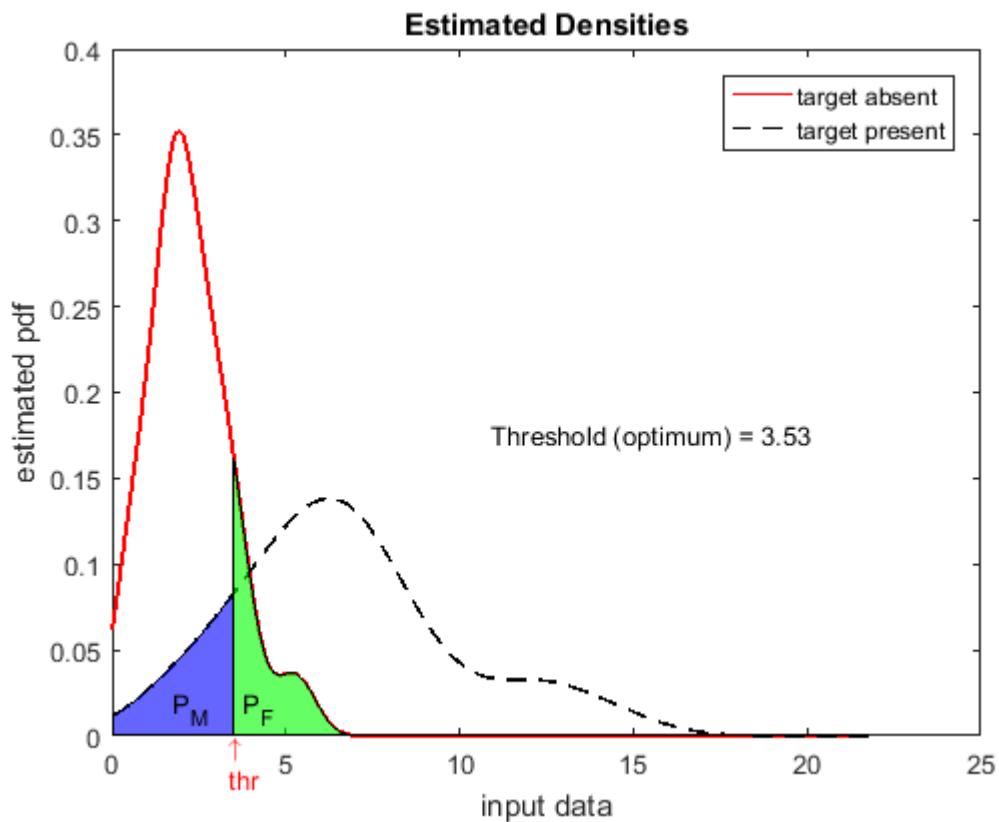
$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{37}{40} & \frac{1}{6} \\ \frac{3}{40} & \frac{5}{6} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.925 & 0.16667 \\ 0.075 & 0.8333 \end{bmatrix}$$

$$P_F = \frac{3}{40} = 0.075 \quad P_M = \frac{1}{6} = 0.16667 \quad \text{PPV} = \frac{25}{28} = 0.89286$$

p m shankar





Confusion Matrix : Threshold (optimum) = 3.53

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	4	36
	Target Present	26	4
	Total Counts	30	40

dist to top left corner of the ROC curve = 0.167

Transition Matrix: Threshold (optimum) = 3.53

$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{9}{10} & \frac{2}{15} \\ \frac{1}{10} & \frac{13}{15} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.9 & 0.1333 \\ 0.1 & 0.8667 \end{bmatrix}$$

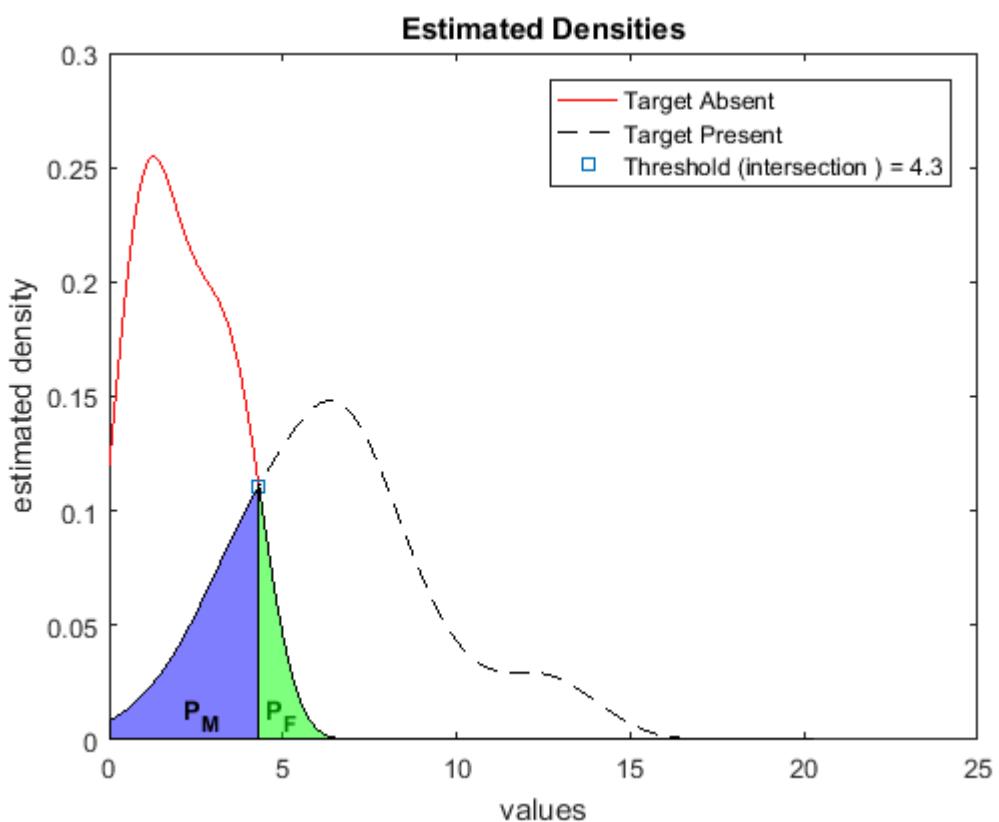
$$P_F = \frac{1}{10} = 0.1 \quad P_M = \frac{2}{15} = 0.1333 \quad \text{PPV} = \frac{13}{15} = 0.8667$$

p m shankar

data (Gish)

Target Absent					Target Present				
3.791	2.88	3.76	3.511	0.579	11.757	5.001	8.29	6.699	7.766
0.675	1.585	1.049	1.13	2.677	2.978	6.383	2.848	5.456	3.62
3.583	3.932	2.895	1.63	3.139	8.803	1.269	9.974	5.412	9.106
1.373	0.204	2.133	3.655	1.083	3.723	5.2	6.181	4.845	6.638
2.974	4.409	0.69	0.488	2.834	6.578	4.035	7.054	4.286	7.665
0.504	1.72	1.936	0.519	2.211	7.417	6.326	7.01	12.407	13.566
1.52	2.736	1.114	0.922	1.052					
3.898	1.956	0.697	1.979	4.595					

(c) P. M. Shankar



Confusion Matrix: Threshold (intersection) = 4.3

Data Collected	Target Detected	Target Not Detected	Total Counts
Target Absent	2	38	40
Target Present	23	7	30
Total Counts	25	45	70

dist to top left corner of the ROC curve = 0.239

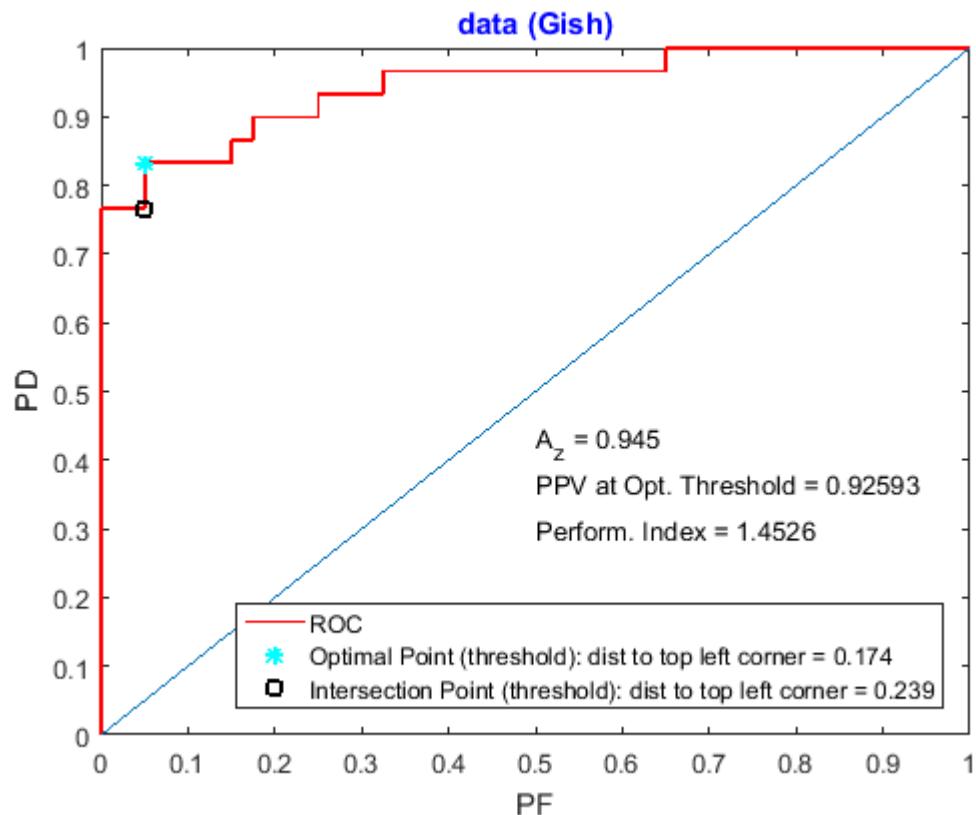
Transition Matrix: Threshold (intersection) = 4.3

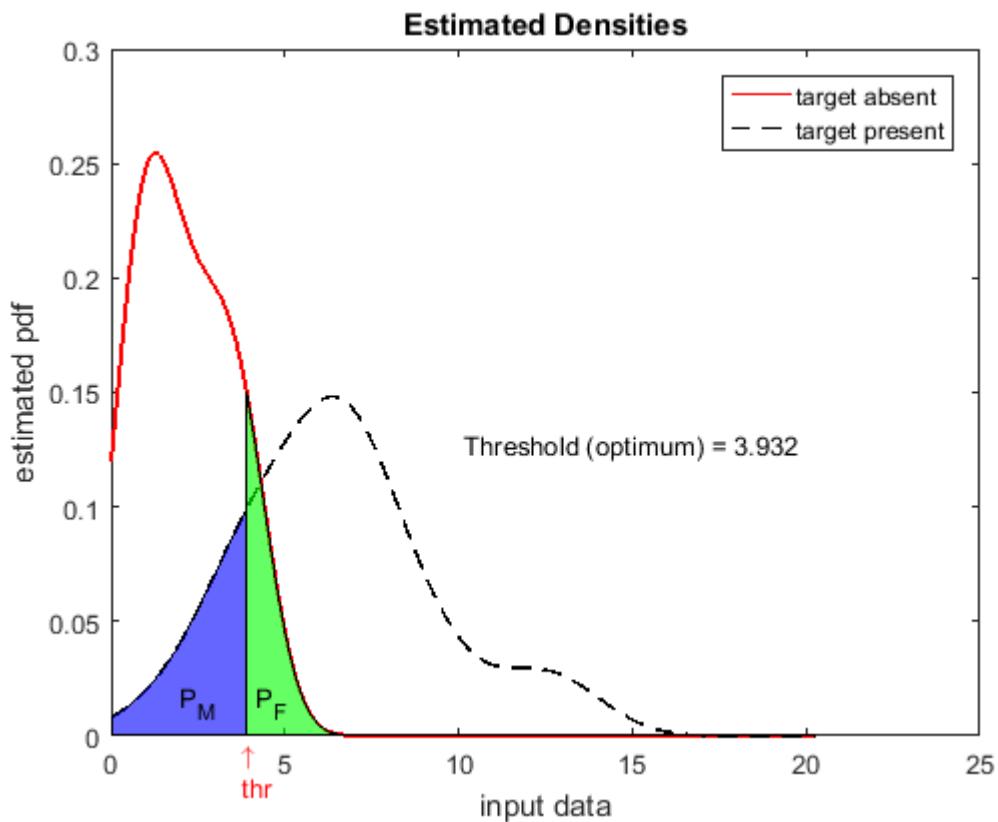
$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{19}{20} & \frac{7}{30} \\ \frac{1}{20} & \frac{23}{30} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.95 & 0.2333 \\ 0.05 & 0.7667 \end{bmatrix}$$

$$P_F = \frac{1}{20} = 0.05 \quad P_M = \frac{7}{30} = 0.2333 \quad \text{PPV} = \frac{23}{25} = 0.92$$

p m shankar





Confusion Matrix : Threshold (optimum) = 3.932

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	2	38
	Target Present	25	5
	Total Counts	27	43

dist to top left corner of the ROC curve = 0.174

Transition Matrix: Threshold (optimum) = 3.932

$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

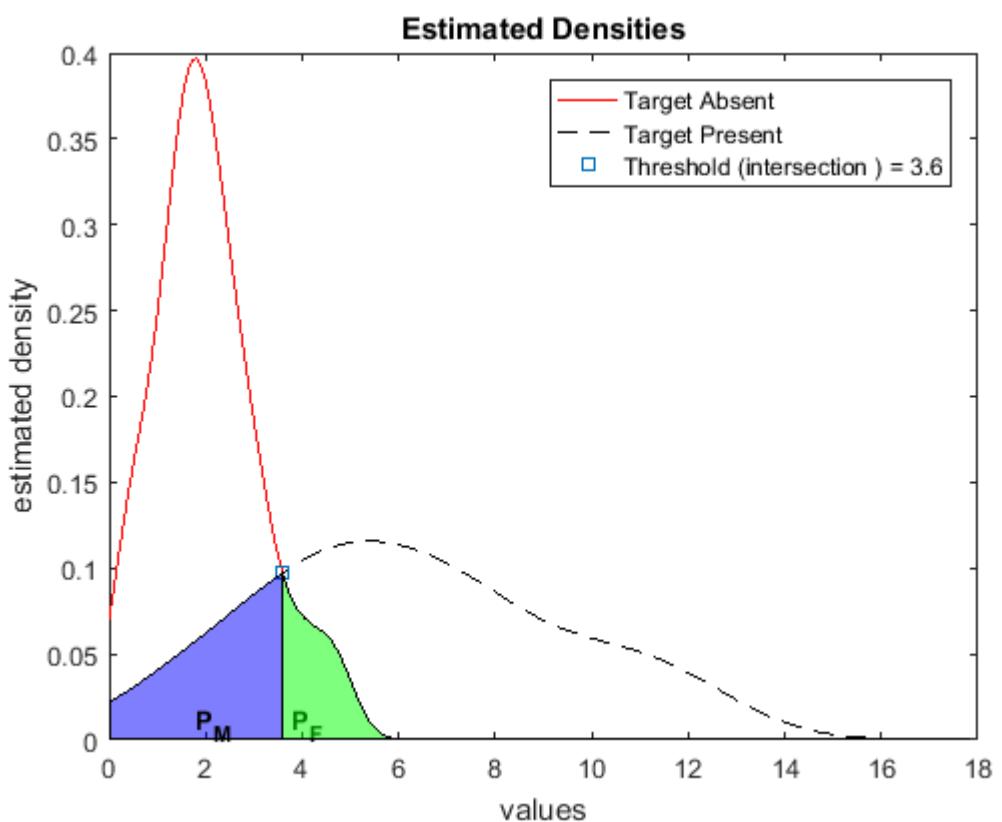
$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{19}{20} & \frac{1}{6} \\ \frac{1}{20} & \frac{5}{6} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.95 & 0.16667 \\ 0.05 & 0.8333 \end{bmatrix}$$

$$P_F = \frac{1}{20} = 0.05 \quad P_M = \frac{1}{6} = 0.16667 \quad \text{PPV} = \frac{25}{27} = 0.92593$$

p m shankar

data (Hammer)									
Target Absent					Target Present				
0.448	1.29	2.148	0.643	2.297	6.781	4.529	6.866	5.508	2.083
1.859	1.186	2.073	3.255	2.324	11.662	3.821	6.22	4.09	5.114
1.991	1.441	1.303	2.305	1.716	7.416	11.026	11.047	3.998	11.925
3.835	4.59	0.488	2.438	2.105	7.758	9.65	7.966	6.016	6.101
0.353	1.929	1.385	1.728	3.131	10.192	1.843	1.298	4.391	3.731
1.502	2.467	2.903	0.853	1.516	1.492	8.313	3.907	7.533	4.98
3.063	1.706	1.63	1.211	2.723					
1.752	4.698	2.854	0.408	3.95					

(c) P. M. Shankar



Confusion Matrix: Threshold (intersection) = 3.6

Data Collected	Target Detected	Target Not Detected	Total Counts
Target Absent	4	36	40
Target Present	26	4	30
Total Counts	30	40	70

Errors circled

dist to top left corner of the ROC curve = 0.167

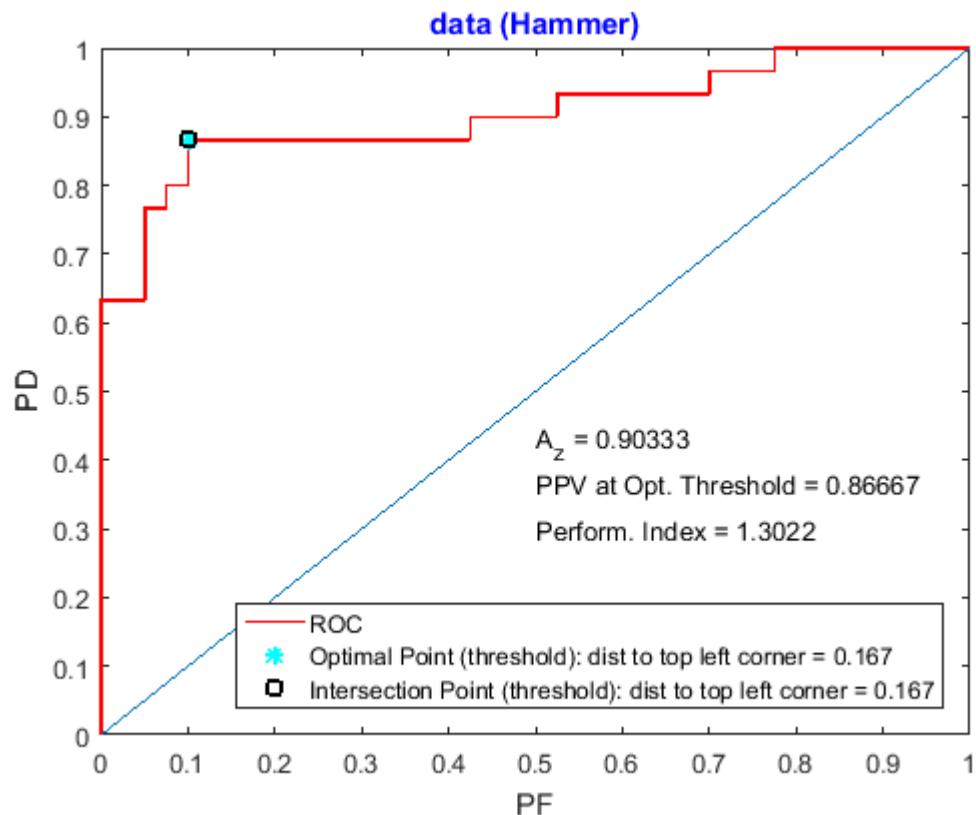
Transition Matrix: Threshold (intersection) = 3.6

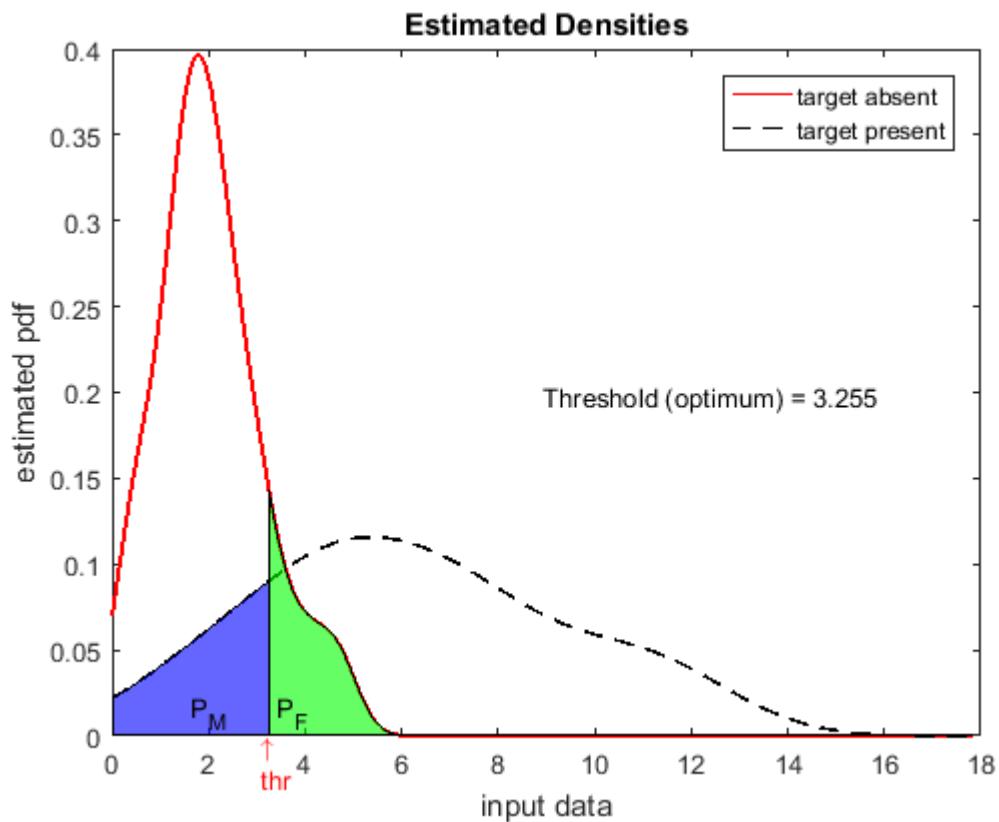
$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{9}{10} & \frac{2}{15} \\ \frac{1}{10} & \frac{13}{15} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.9 & 0.1333 \\ 0.1 & 0.8667 \end{bmatrix}$$

$$P_F = \frac{1}{10} = 0.1 \quad P_M = \frac{2}{15} = 0.1333 \quad \text{PPV} = \frac{13}{15} = 0.86667$$

p m shankar





Confusion Matrix : Threshold (optimum) = 3.255

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent 4	36	40
	Target Present 26	4	30
	Total Counts 30	40	70

dist to top left corner of the ROC curve = 0.167

Transition Matrix: Threshold (optimum) = 3.255

$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{9}{10} & \frac{2}{15} \\ \frac{1}{10} & \frac{13}{15} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.9 & 0.1333 \\ 0.1 & 0.8667 \end{bmatrix}$$

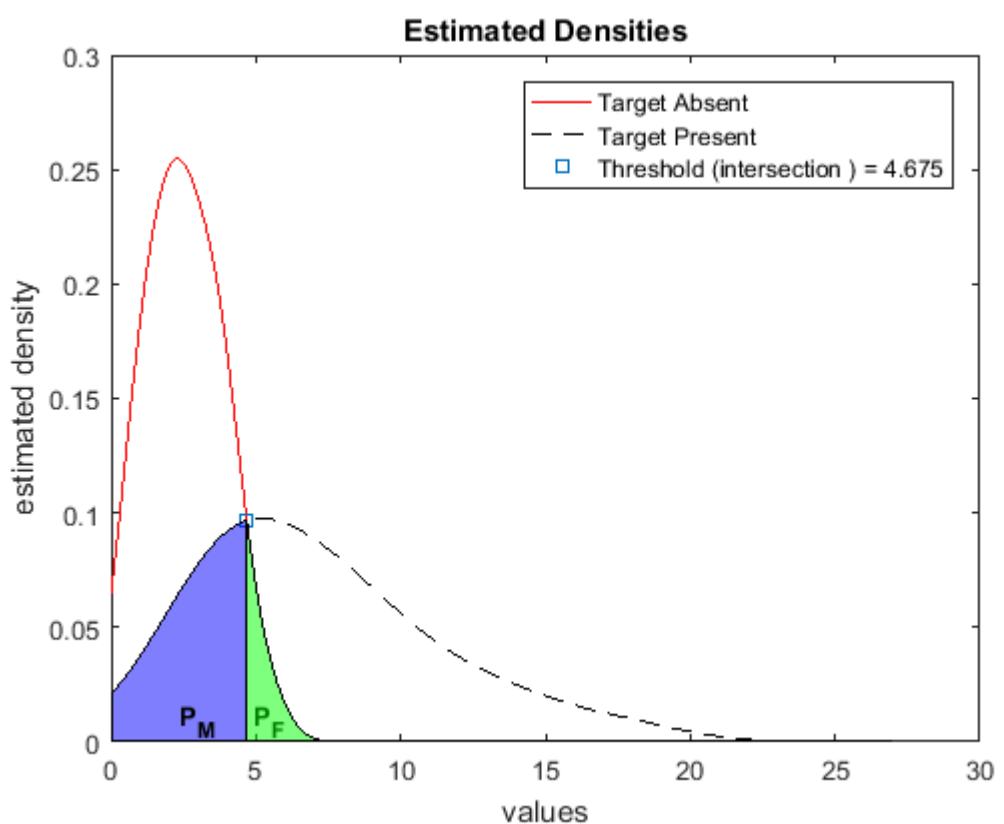
$$P_F = \frac{1}{10} = 0.1 \quad P_M = \frac{2}{15} = 0.1333 \quad \text{PPV} = \frac{13}{15} = 0.8667$$

p m shankar

data (Harman)

Target Absent					Target Present				
2.642	2.81	1.829	3.791	2.457	3.198	8.626	3.709	9.722	4.444
2.221	2.478	2.437	0.813	1.776	6.789	7.184	5.508	10.779	8.542
4.127	1.633	5.427	2.27	1.842	9.471	4.548	7.095	15.235	3.923
1.54	3.901	0.515	3.533	0.728	17.986	7.522	2.802	4.263	13.48
0.675	4.079	4.167	3.14	1.252	7.808	1.324	3.578	4.443	12.813
1.147	3.403	2.15	2.525	3.059	2.048	4.994	6.805	11.46	5.275
1.874	4.891	3.56	4.085	1.06					
2.463	1.34	3.358	3.468	0.639					

(c) P. M. Shankar



Confusion Matrix: Threshold (intersection) = 4.675

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	2	38
	Target Present	19	11
	Total Counts	21	49

dist to top left corner of the ROC curve = 0.37

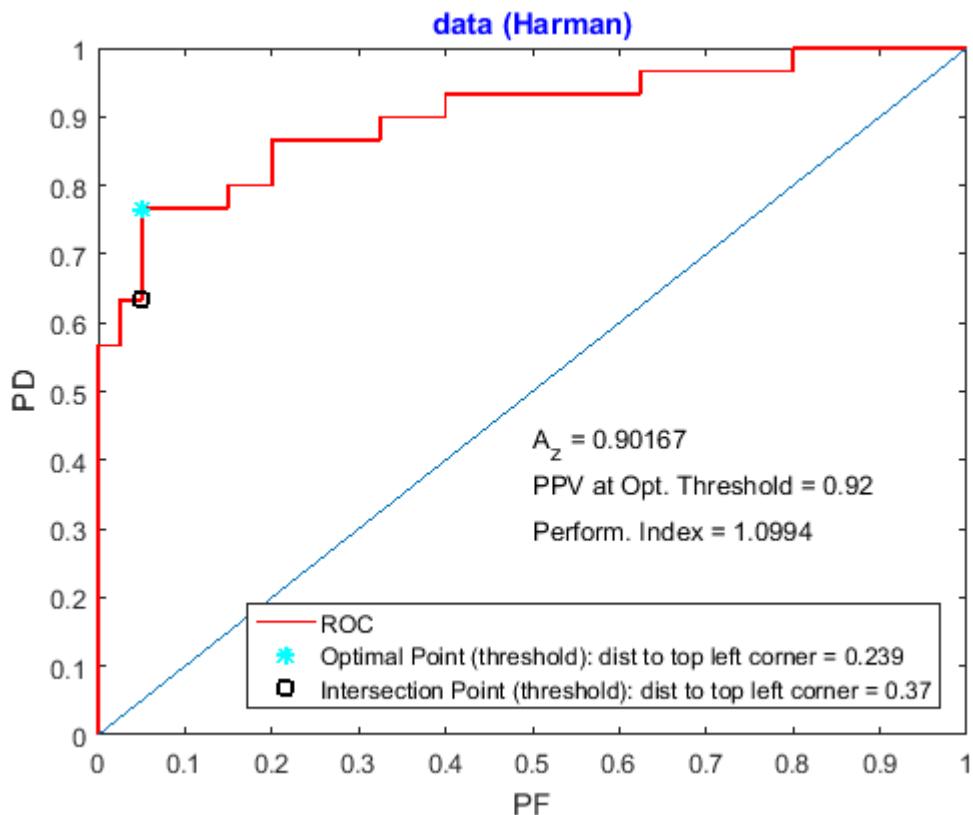
Transition Matrix: Threshold (intersection) = 4.675

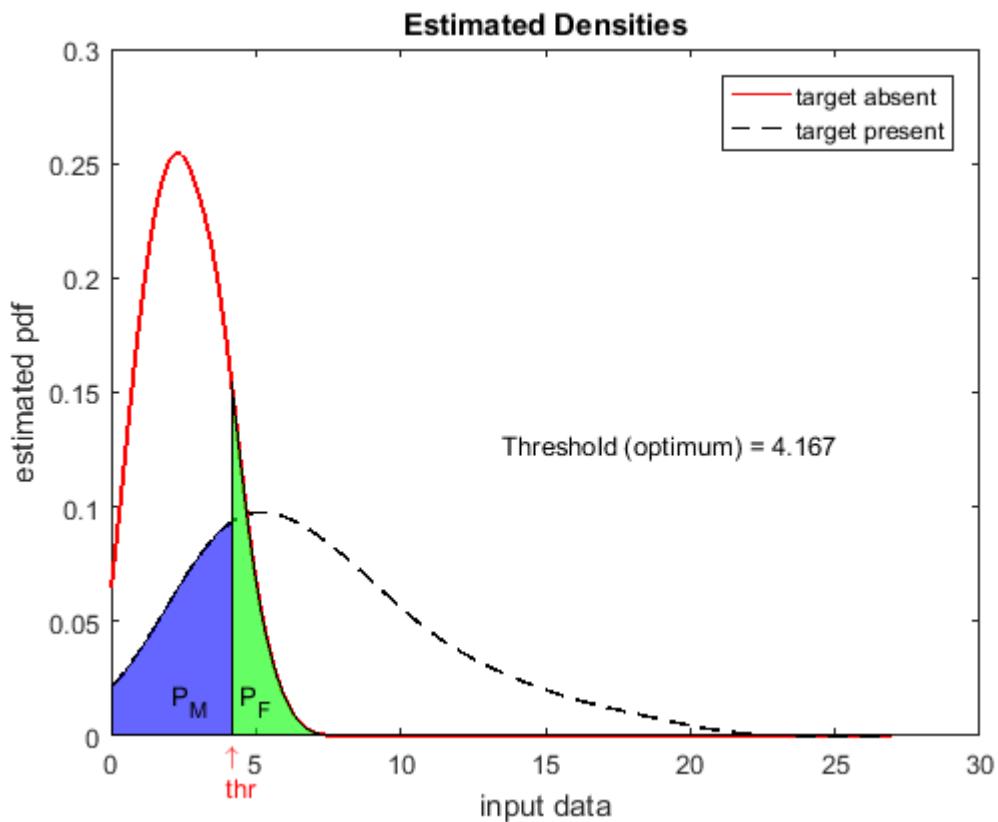
$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{19}{20} & \frac{11}{30} \\ \frac{1}{20} & \frac{19}{30} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.95 & 0.3667 \\ 0.05 & 0.6333 \end{bmatrix}$$

$$P_F = \frac{1}{20} = 0.05 \quad P_M = \frac{11}{30} = 0.36667 \quad \text{PPV} = \frac{19}{21} = 0.90476$$

p m shankar





Confusion Matrix : Threshold (optimum) = 4.167

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	2	38
	Target Present	23	7
	Total Counts	25	45

dist to top left corner of the ROC curve = 0.239

Transition Matrix: Threshold (optimum) = 4.167

$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{19}{20} & \frac{7}{30} \\ \frac{1}{20} & \frac{23}{30} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.95 & 0.2333 \\ 0.05 & 0.7667 \end{bmatrix}$$

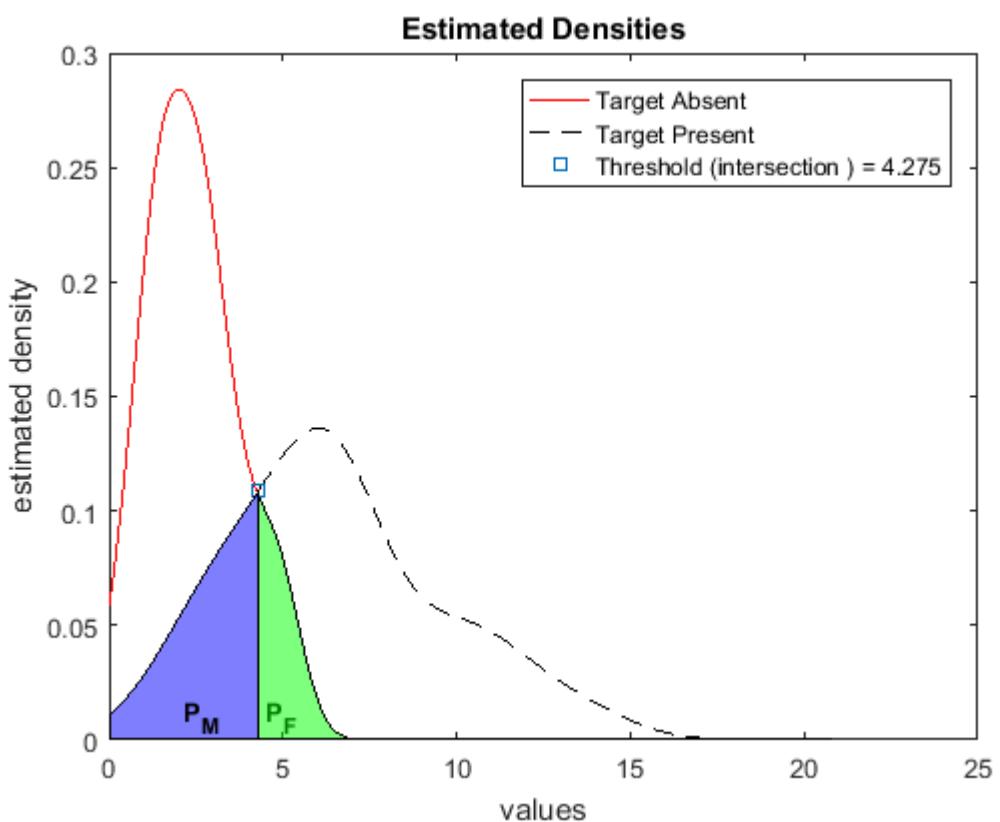
$$P_F = \frac{1}{20} = 0.05 \quad P_M = \frac{7}{30} = 0.2333 \quad \text{PPV} = \frac{23}{25} = 0.92$$

p m shankar

data (Hasan)

Target Absent					Target Present				
3.025	0.652	4.905	1.055	4.705	6.858	2.857	5.937	1.96	6.754
2.224	3.253	4.388	1.793	1.953	4.322	5.682	13.872	3.787	12.073
2.971	1.294	1.199	4.88	1.78	6.435	6.864	7.844	10.159	10.047
2.683	1.02	1.669	1.437	2.824	4.541	5.95	11.633	5.485	1.826
2.685	1.496	1.148	2.633	3.263	5.415	10.257	9.453	5.99	4.101
3.904	1.195	2.592	2.388	2.921	3.036	6.854	6.877	3.42	6.913
5.272	1.567	2.59	3.746	1.956					
1.906	0.069	0.547	3.843	2.177					

(c) P. M. Shankar



Confusion Matrix: Threshold (intersection) = 4.275

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	5	35
	Target Present	23	7
	Total Counts	28	42

dist to top left corner of the ROC curve = 0.265

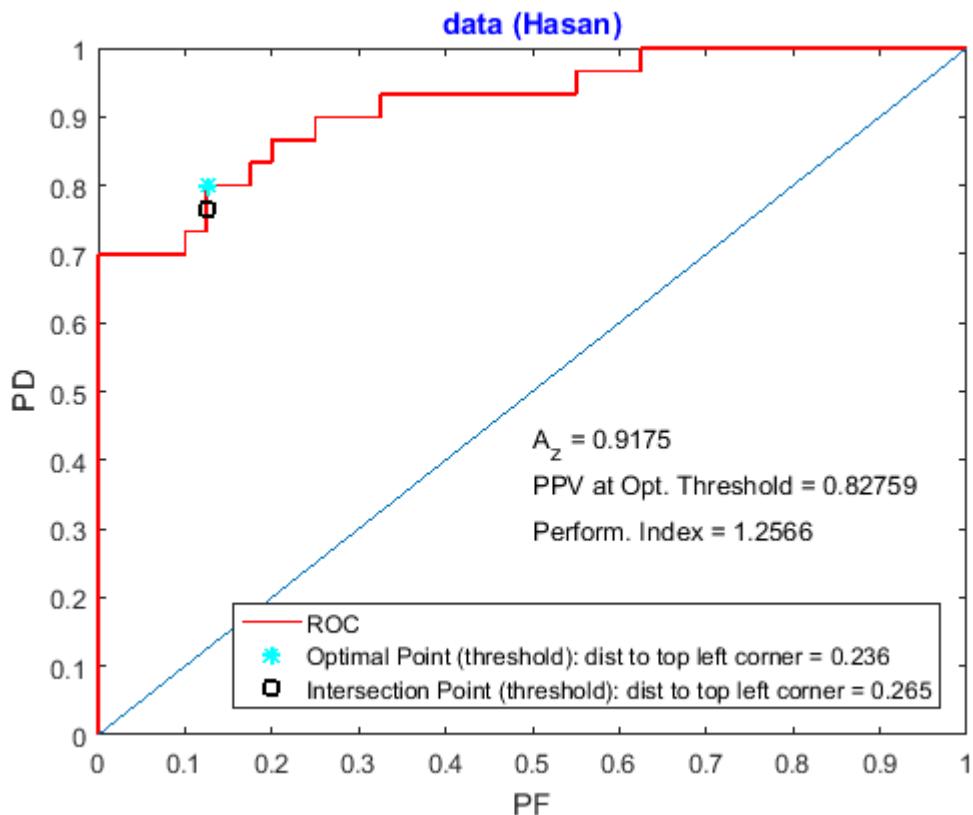
Transition Matrix: Threshold (intersection) = 4.275

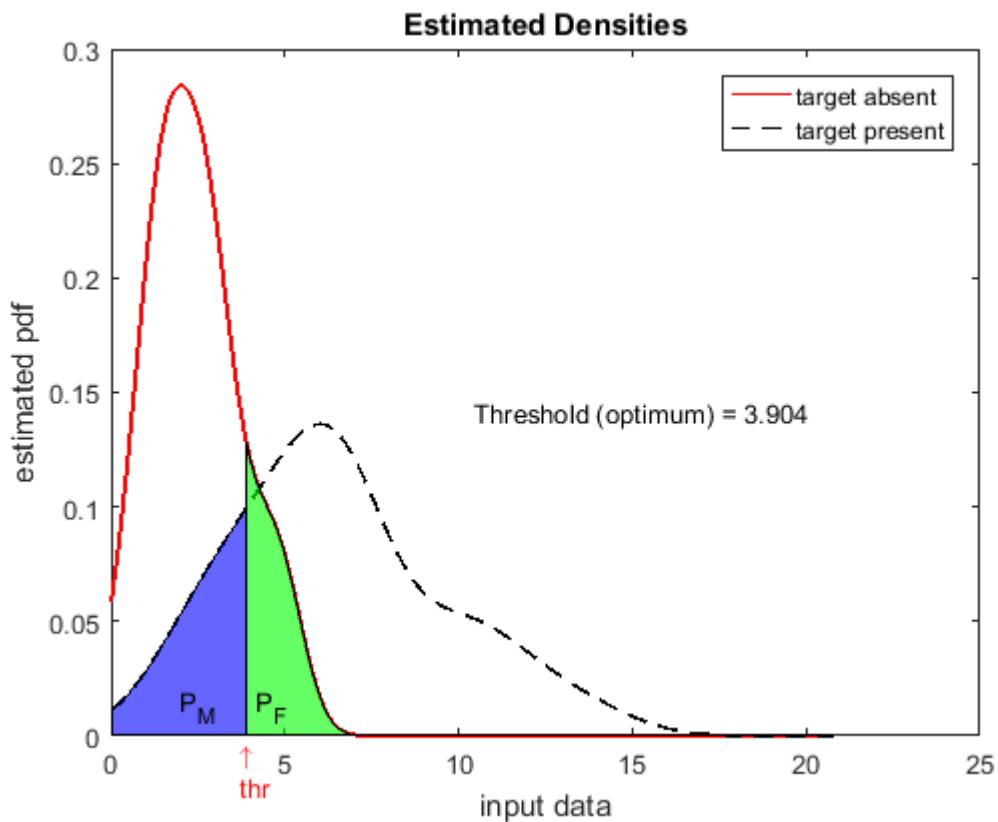
$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{7}{8} & \frac{7}{30} \\ \frac{1}{8} & \frac{23}{30} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.875 & 0.2333 \\ 0.125 & 0.7667 \end{bmatrix}$$

$$P_F = \frac{1}{8} = 0.125 \quad P_M = \frac{7}{30} = 0.23333 \quad \text{PPV} = \frac{23}{28} = 0.82143$$

p m shankar





Confusion Matrix : Threshold (optimum) = 3.904

Data Collected		Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	5	35	40
	Target Present	24	6	30
	Total Counts	29	41	70

dist to top left corner of the ROC curve = 0.236

Transition Matrix: Threshold (optimum) = 3.904

$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{7}{8} & \frac{1}{5} \\ \frac{1}{8} & \frac{4}{5} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.875 & 0.2 \\ 0.125 & 0.8 \end{bmatrix}$$

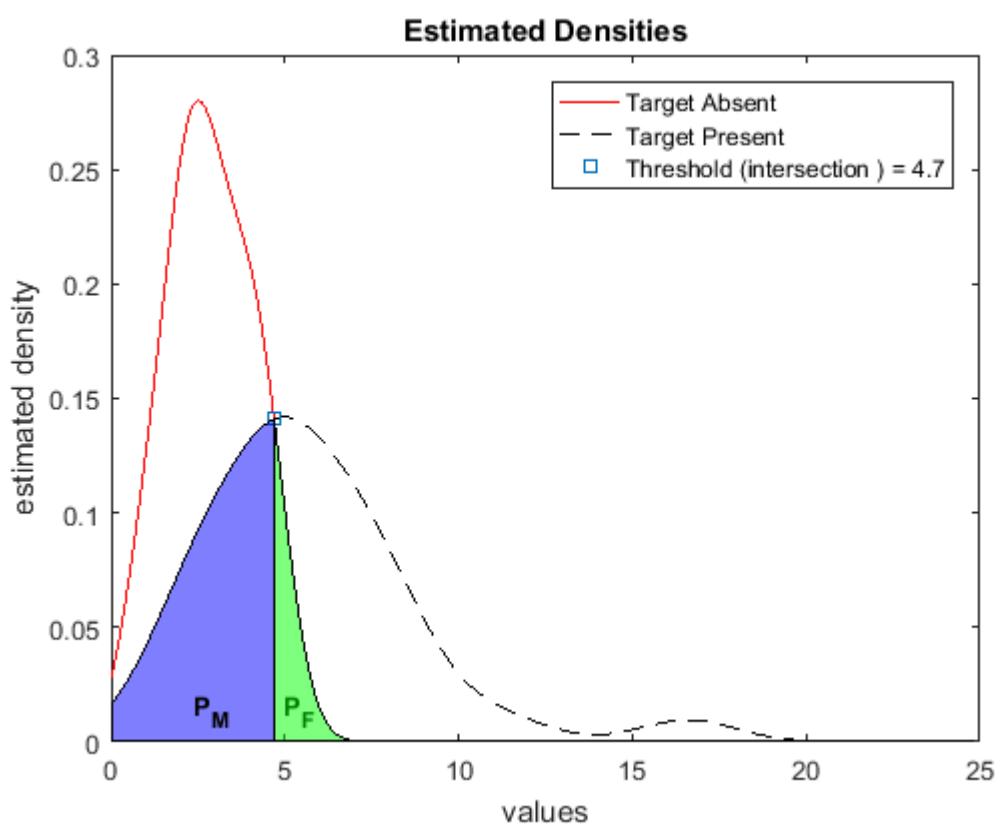
$$P_F = \frac{1}{8} = 0.125 \quad P_M = \frac{1}{5} = 0.2 \quad \text{PPV} = \frac{24}{29} = 0.82759$$

p m shankar

data (Hoque)

Target Absent					Target Present				
2.131	2.18	1.93	4.195	3.168	7.1	2.623	6.976	4.021	2.053
1.76	4.128	2.197	2.5	2.46	5.892	2.487	5.344	7.591	4.782
3.573	2.449	2.014	4.317	2.671	11.265	5.518	5.085	6.963	3.825
4.447	1.709	4.043	0.937	1.473	9.057	16.581	7.807	5.332	1.709
3.046	3.17	2.966	4.762	3.822	2.106	3.463	3.065	4.729	6.414
0.803	4.741	4.36	3.561	2.83	7.639	4.498	4.871	4.712	8.445
3.743	0.919	1.802	2.773	0.842					
5.193	2.366	3.66	2.864	1.961					

(c) P. M. Shankar



Confusion Matrix: Threshold (intersection) = 4.7

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	3	37
	Target Present	20	10
	Total Counts	23	47

dist to top left corner of the ROC curve = 0.342

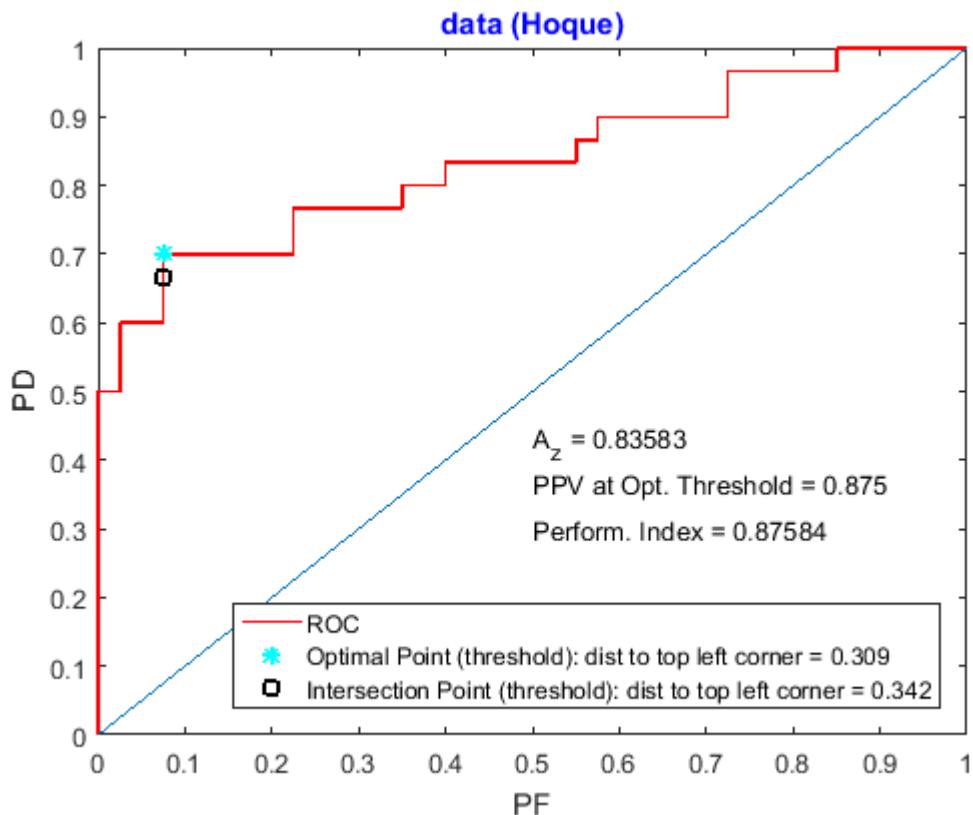
Transition Matrix: Threshold (intersection) = 4.7

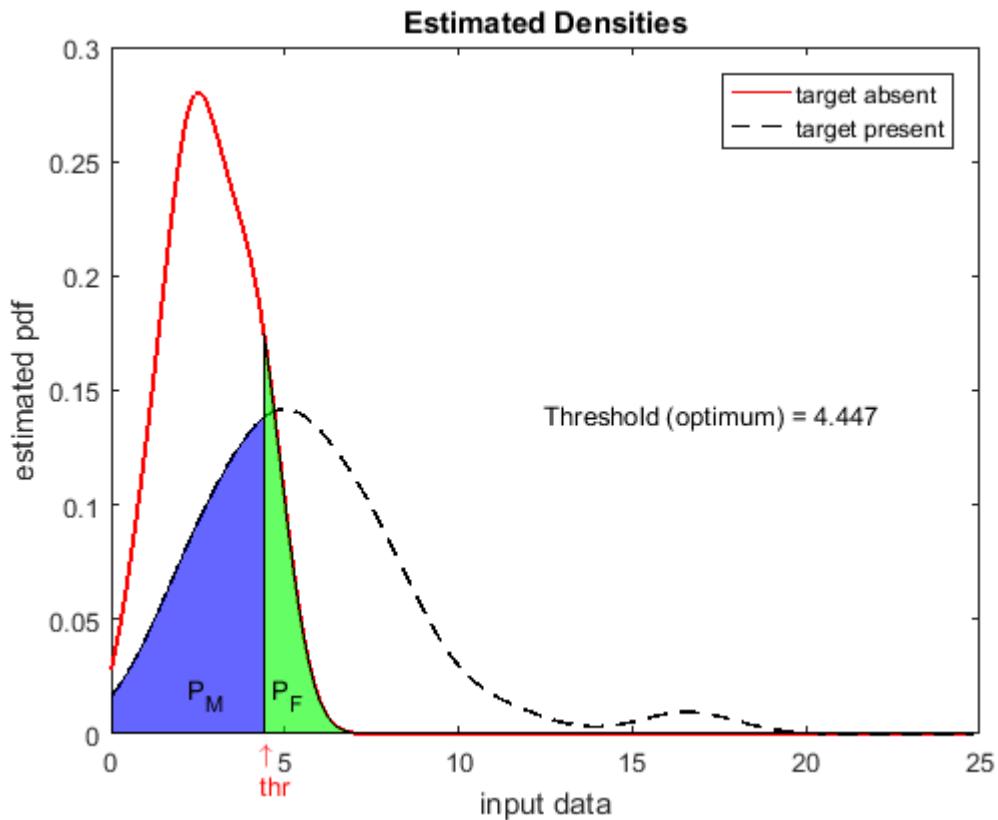
$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{37}{40} & \frac{1}{3} \\ \frac{3}{40} & \frac{2}{3} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.925 & 0.3333 \\ 0.075 & 0.6667 \end{bmatrix}$$

$$P_F = \frac{3}{40} = 0.075 \quad P_M = \frac{1}{3} = 0.33333 \quad \text{PPV} = \frac{20}{23} = 0.86957$$

p m shankar





Confusion Matrix : Threshold (optimum) = 4.447

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	3	37
	Target Present	21	9
	Total Counts	24	46

dist to top left corner of the ROC curve = 0.309

Transition Matrix: Threshold (optimum) = 4.447

$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{37}{40} & \frac{3}{10} \\ \frac{3}{40} & \frac{7}{10} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.925 & 0.3 \\ 0.075 & 0.7 \end{bmatrix}$$

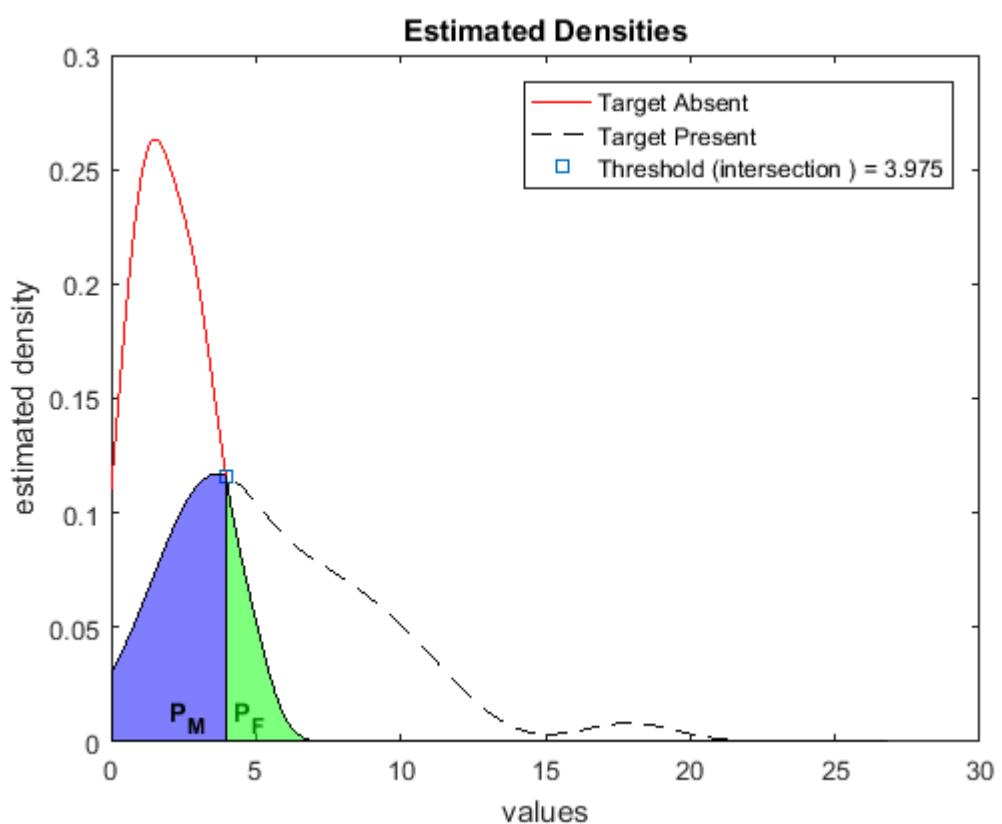
$$P_F = \frac{3}{40} = 0.075 \quad P_M = \frac{3}{10} = 0.3 \quad \text{PPV} = \frac{7}{8} = 0.875$$

p m shankar

data (Huynh)

Target Absent					Target Present				
0.376	0.669	1.422	0.846	3.035	5.793	2.786	2.345	4.371	11.747
4.696	0.389	1.961	4.465	1.884	11.104	2.01	6.781	6.196	9.741
1.616	2.864	1.681	4.168	1.172	2.611	9.008	8.742	3.101	3.452
3.375	0.702	1.284	2.865	1.083	7.544	4.668	3.709	4.1	6.347
0.83	2.81	5.036	0.249	1.391	7.676	4.366	1.487	0.514	4.085
1.001	1.428	2.999	2.247	0.338	9.838	3.063	7.516	17.889	3.486
3.519	1.64	1.937	1.498	2.966					
2.286	2.914	3.878	2.929	2.497					

(c) P. M. Shankar



Confusion Matrix: Threshold (intersection) = 3.975

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	4	36
	Target Present	19	11
	Total Counts	23	47

dist to top left corner of the ROC curve = 0.38

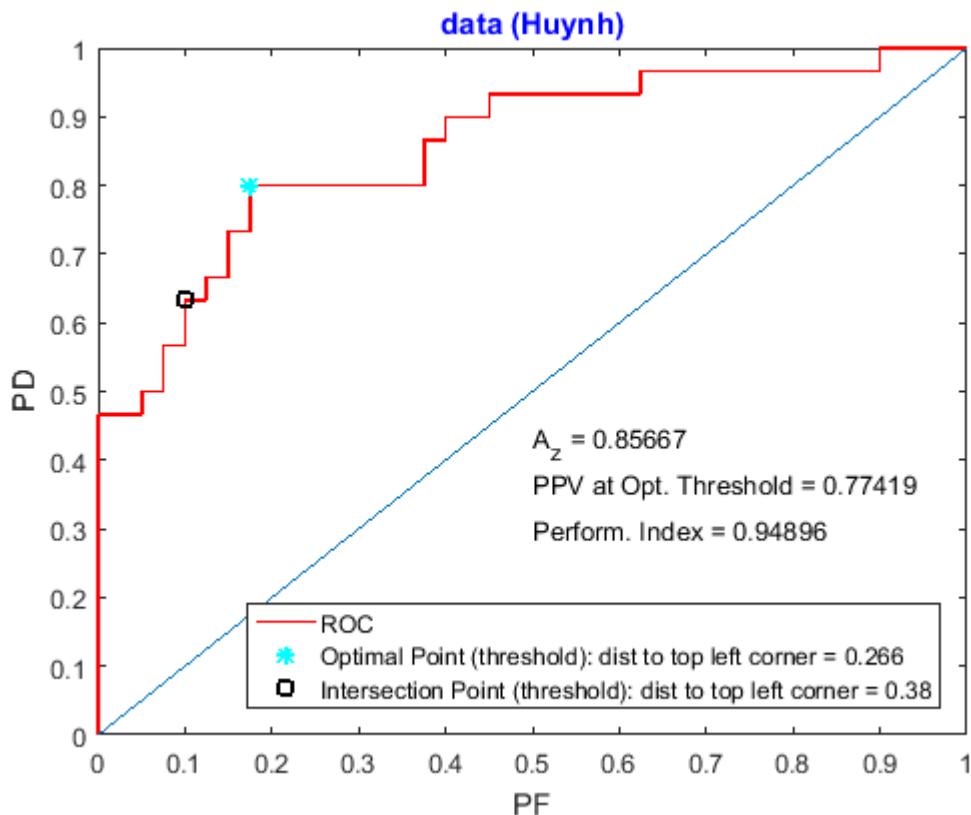
Transition Matrix: Threshold (intersection) = 3.975

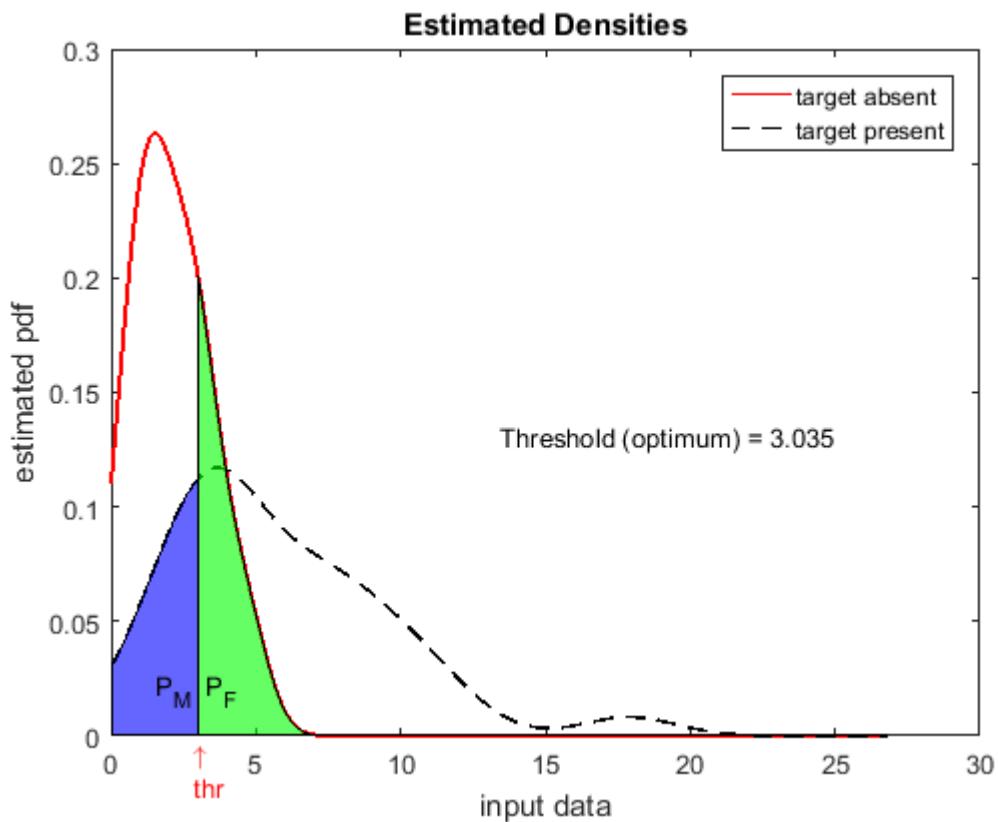
$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{9}{10} & \frac{11}{30} \\ \frac{1}{10} & \frac{19}{30} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.9 & 0.36667 \\ 0.1 & 0.6333 \end{bmatrix}$$

$$P_F = \frac{1}{10} = 0.1 \quad P_M = \frac{11}{30} = 0.36667 \quad \text{PPV} = \frac{19}{23} = 0.82609$$

p m shankar





Confusion Matrix : Threshold (optimum) = 3.035

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	7	33
	Target Present	24	6
	Total Counts	31	39

dist to top left corner of the ROC curve = 0.266

Transition Matrix: Threshold (optimum) = 3.035

$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{33}{40} & \frac{1}{5} \\ \frac{7}{40} & \frac{4}{5} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.825 & 0.2 \\ 0.175 & 0.8 \end{bmatrix}$$

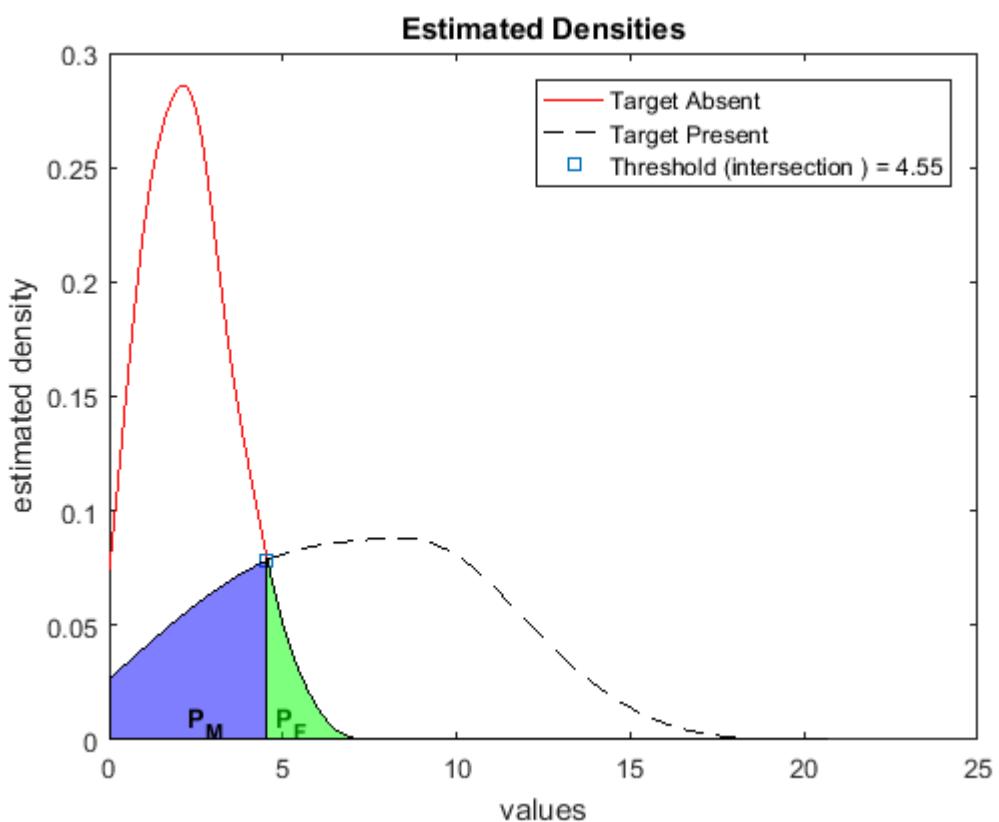
$$P_F = \frac{7}{40} = 0.175 \quad P_M = \frac{1}{5} = 0.2 \quad \text{PPV} = \frac{24}{31} = 0.77419$$

p m shankar

data (Jacob)

Target Absent					Target Present				
3.995	1.414	2.652	2.381	2.559	8.879	13.828	9.721	2.477	0.54
2.421	4.774	1.464	0.553	0.771	1.935	4.576	2.095	3.853	10.203
4.083	0.737	2.259	1.583	2.418	3.653	9.504	5.977	9.014	6.142
0.765	0.576	1.674	2.174	3.377	6.666	11.331	1.283	5.183	5.341
2.775	3.064	4.075	2.31	1.225	8.43	4.777	7.435	9.565	10.287
3.786	2.455	2.348	2.969	1.108	5.495	12.887	7.597	11.825	9.488
2.935	1.362	3.905	1.342	0.518					
2.674	1.949	1.192	1.709	5.434					

(c) P. M. Shankar



Confusion Matrix: Threshold (intersection) = 4.55

Data Collected	Target Detected	Target Not Detected	Total Counts
Target Absent	2	38	40
Target Present	23	7	30
Total Counts	25	45	70

Errors circled

dist to top left corner of the ROC curve = 0.239

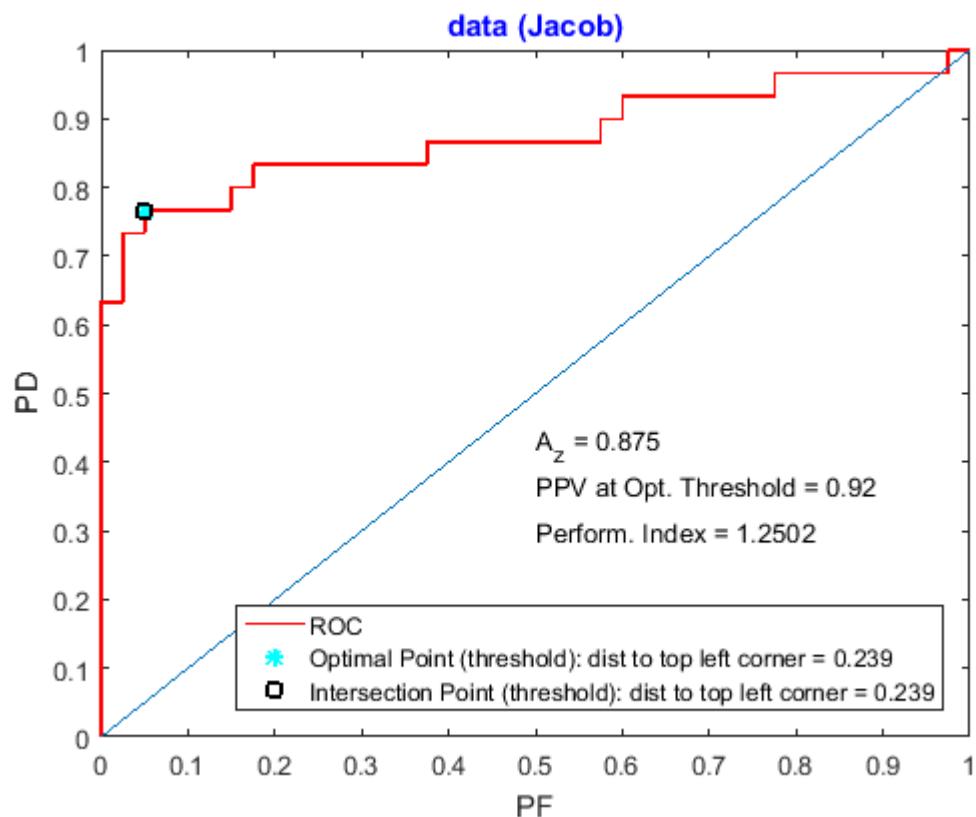
Transition Matrix: Threshold (intersection) = 4.55

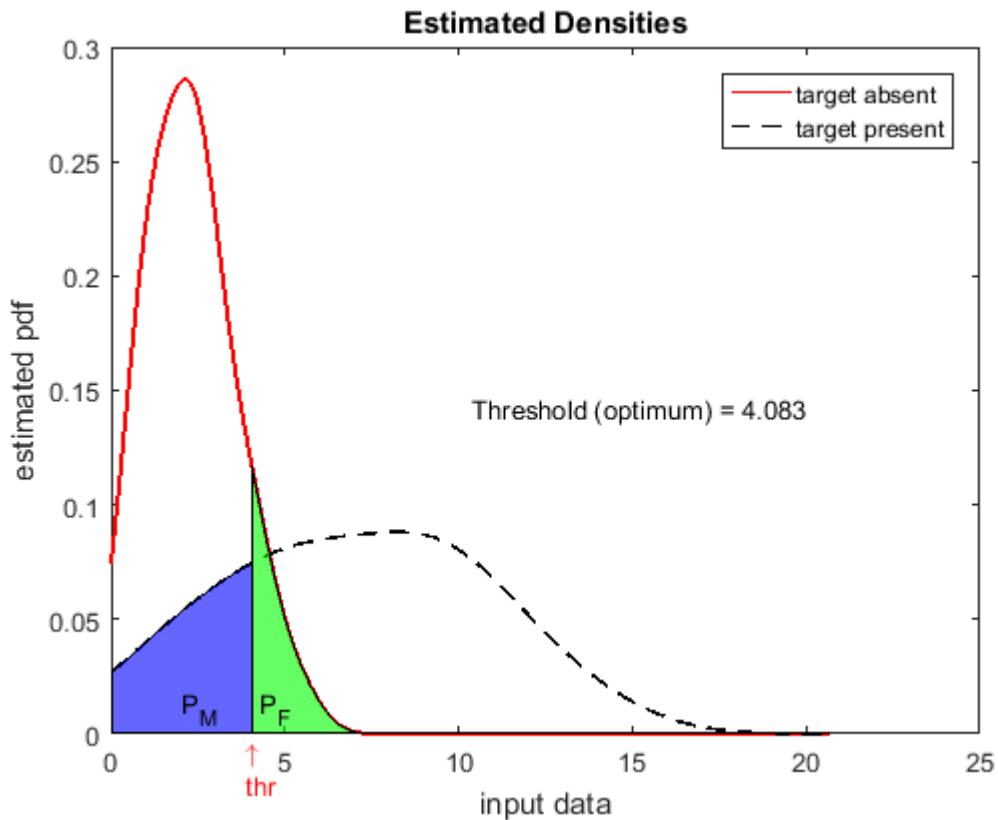
$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{19}{20} & \frac{7}{30} \\ \frac{1}{20} & \frac{23}{30} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.95 & 0.2333 \\ 0.05 & 0.7667 \end{bmatrix}$$

$$P_F = \frac{1}{20} = 0.05 \quad P_M = \frac{7}{30} = 0.2333 \quad \text{PPV} = \frac{23}{25} = 0.92$$

p m shankar





Confusion Matrix : Threshold (optimum) = 4.083

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	2	38
	Target Present	23	7
	Total Counts	25	45

dist to top left corner of the ROC curve = 0.239

Transition Matrix: Threshold (optimum) = 4.083

$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{19}{20} & \frac{7}{30} \\ \frac{1}{20} & \frac{23}{30} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.95 & 0.2333 \\ 0.05 & 0.7667 \end{bmatrix}$$

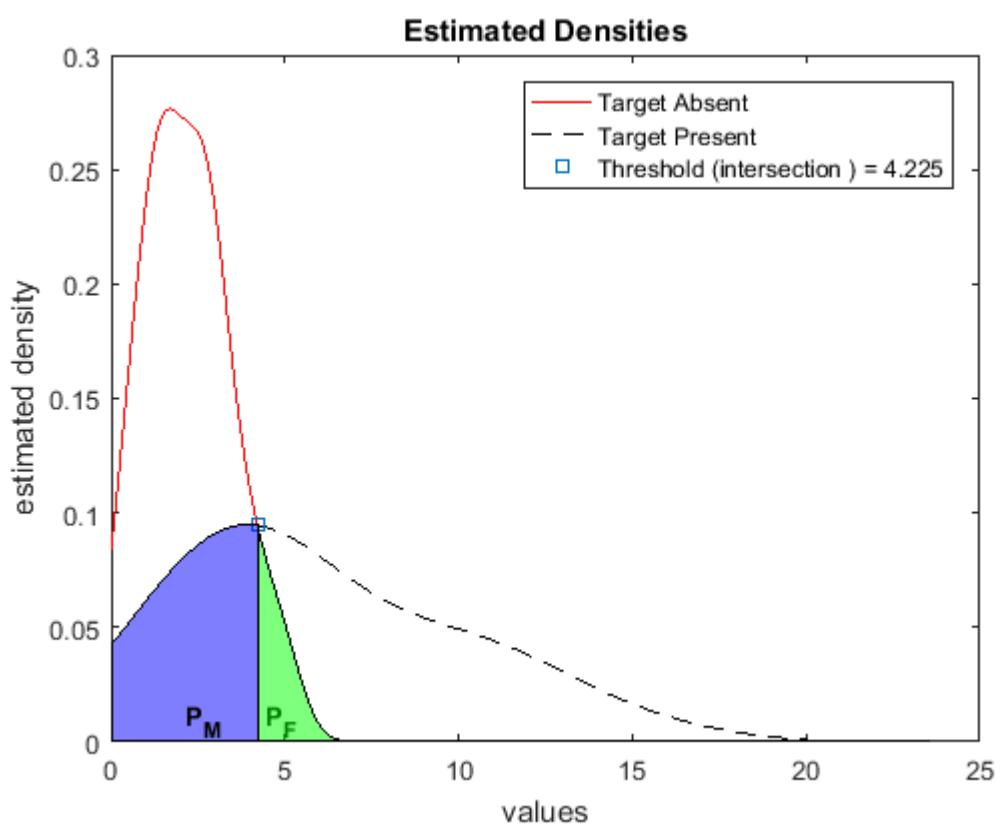
$$P_F = \frac{1}{20} = 0.05 \quad P_M = \frac{7}{30} = 0.2333 \quad \text{PPV} = \frac{23}{25} = 0.92$$

p m shankar

data (Jiang)

Target Absent					Target Present				
4.931	2.262	3.125	2.795	0.693	5.135	1.21	3.526	5.284	11.267
1.287	1.892	2.335	1.497	1.71	11.564	2.731	8.605	1.01	5.54
2.893	4.018	2.731	1.426	1.068	1.245	3.598	3.182	12.453	5.234
2.091	1.248	0.592	3.151	2.462	4.221	12.709	1.389	9.907	1.548
2.641	2.855	2.686	3.423	0.197	2.563	9.912	4.786	3.481	5.713
2.52	4.244	0.847	4.063	1.376	8.205	15.707	4.48	8.067	7.463
0.538	3.586	1.505	1.547	2.916					
0.952	4.996	1.728	0.192	1.649					

(c) P. M. Shankar



Confusion Matrix: Threshold (intersection) = 4.225

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	3	37
	Target Present	18	12
	Total Counts	21	49

dist to top left corner of the ROC curve = 0.407

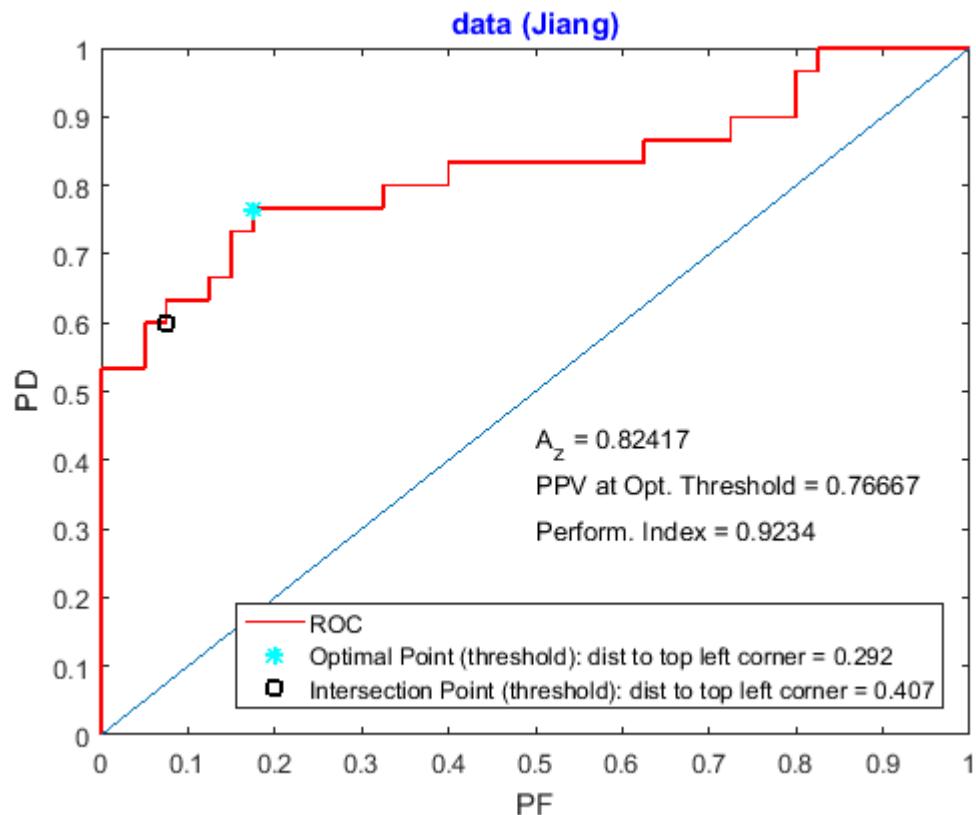
Transition Matrix: Threshold (intersection) = 4.225

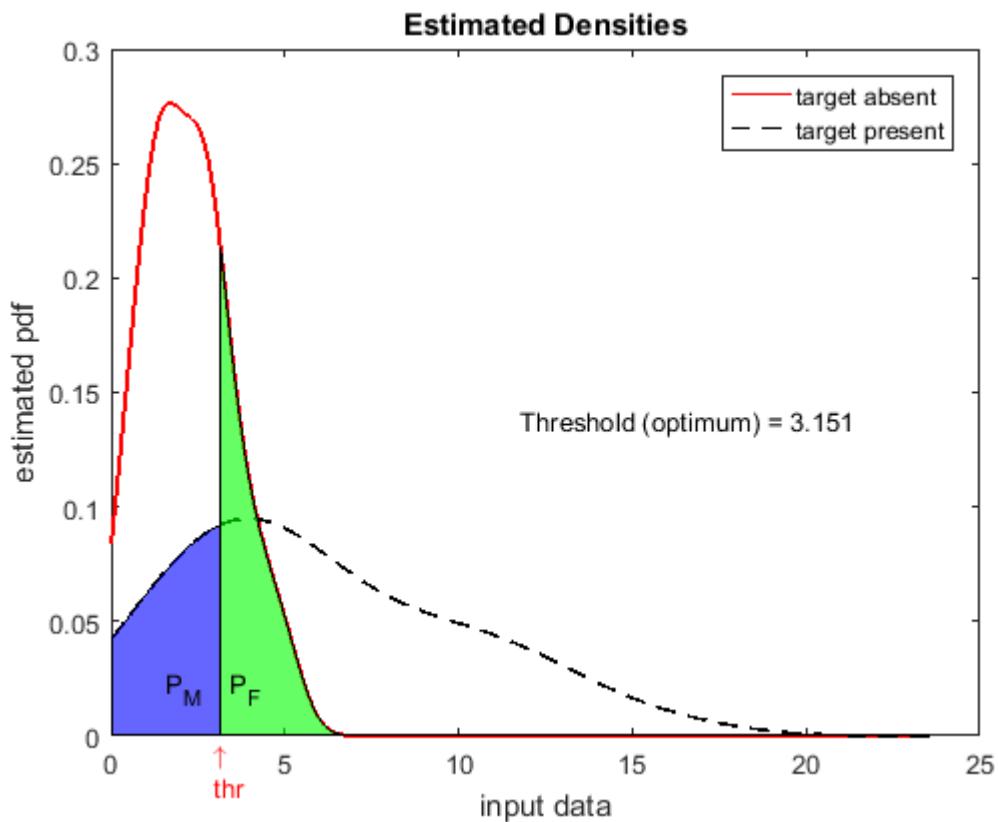
$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{37}{40} & \frac{2}{5} \\ \frac{3}{40} & \frac{3}{5} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.925 & 0.4 \\ 0.075 & 0.6 \end{bmatrix}$$

$$P_F = \frac{3}{40} = 0.075 \quad P_M = \frac{2}{5} = 0.4 \quad \text{PPV} = \frac{6}{7} = 0.85714$$

p m shankar





Confusion Matrix : Threshold (optimum) = 3.151

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	7	33
	Target Present	23	7
	Total Counts	30	40

dist to top left corner of the ROC curve = 0.292

Transition Matrix: Threshold (optimum) = 3.151

$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{33}{40} & \frac{7}{30} \\ \frac{7}{40} & \frac{23}{30} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.825 & 0.2333 \\ 0.175 & 0.7667 \end{bmatrix}$$

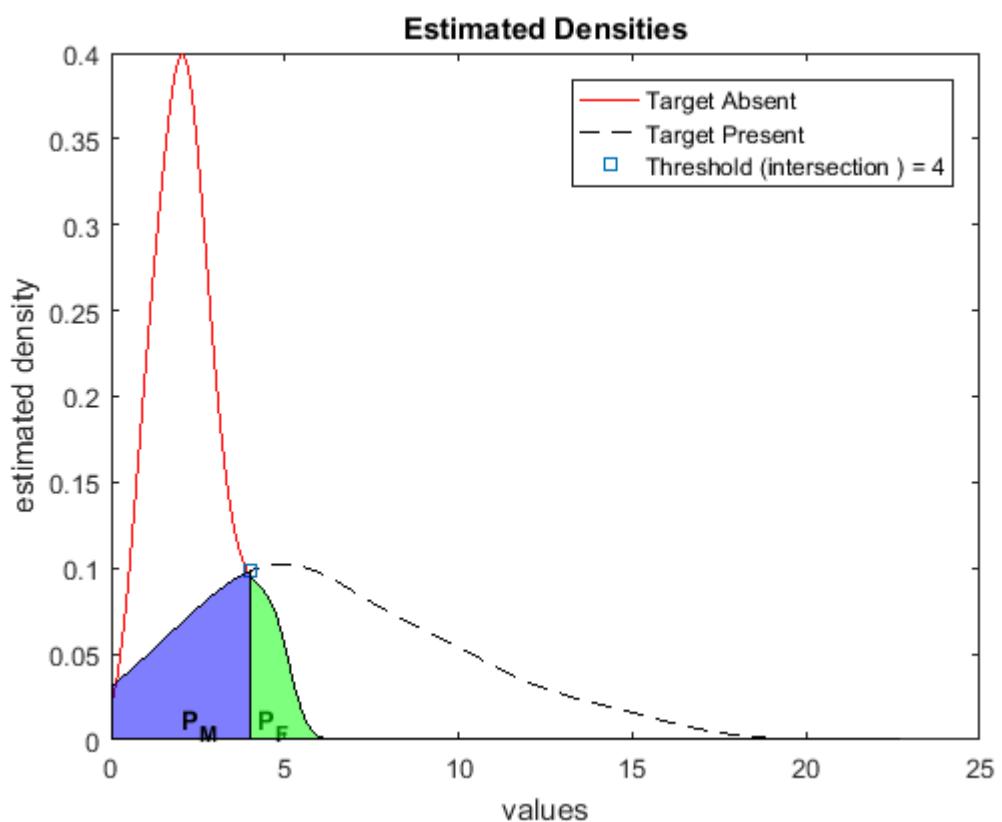
$$P_F = \frac{7}{40} = 0.175 \quad P_M = \frac{7}{30} = 0.2333 \quad \text{PPV} = \frac{23}{30} = 0.76667$$

p m shankar

data (John)

Target Absent					Target Present				
2.276	2.221	1.284	0.924	2.543	8.464	12.397	15.161	9.649	2.959
3.85	0.855	4.715	4.492	1.971	13.514	4.138	5.492	7.675	6.731
3.654	4.082	1.923	3.231	1.715	1.408	9.531	4.576	10.499	0.517
0.745	2.041	2.306	2.952	1.545	10.174	2.454	4.24	3.503	2.81
1.99	2.86	2.795	2.363	0.988	4.953	5.383	5.338	3.223	7.18
3.208	1.996	2.212	4.87	2.034	5.243	5.878	8.929	6.316	0.801
2.553	1.616	1.298	1.355	1.925					
2.363	1.085	1.806	2.717	1.405					

(c) P. M. Shankar



Confusion Matrix: Threshold (intersection) = 4

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	4	36
	Target Present	22	8
	Total Counts	26	44

dist to top left corner of the ROC curve = 0.285

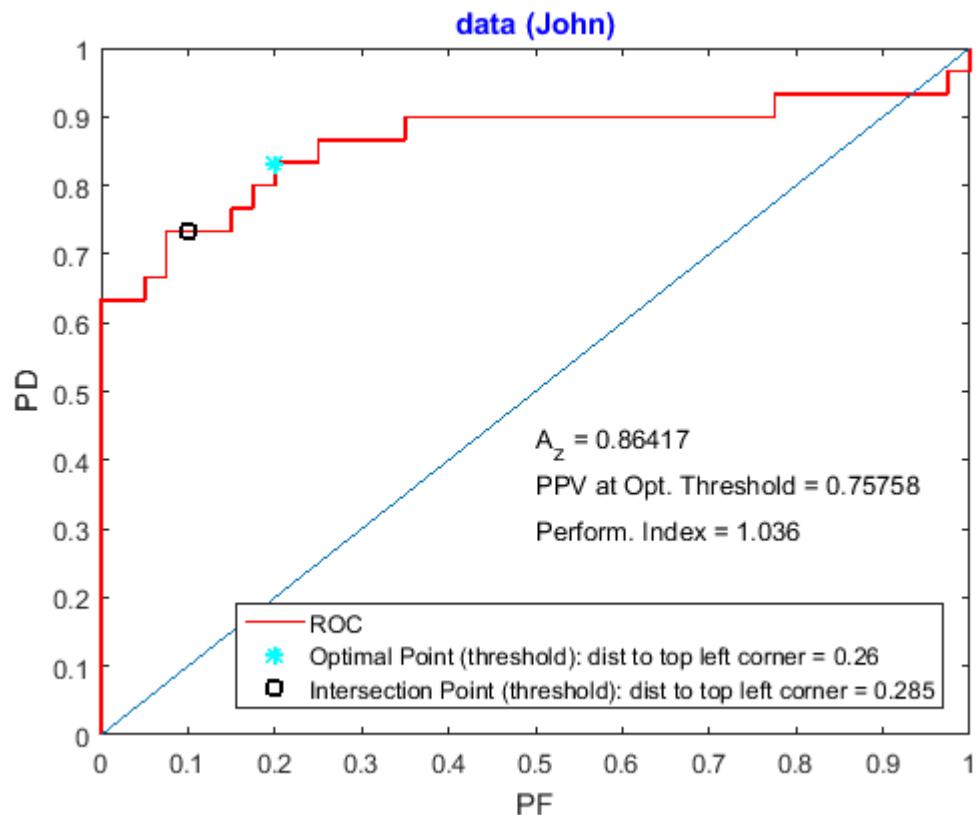
Transition Matrix: Threshold (intersection) = 4

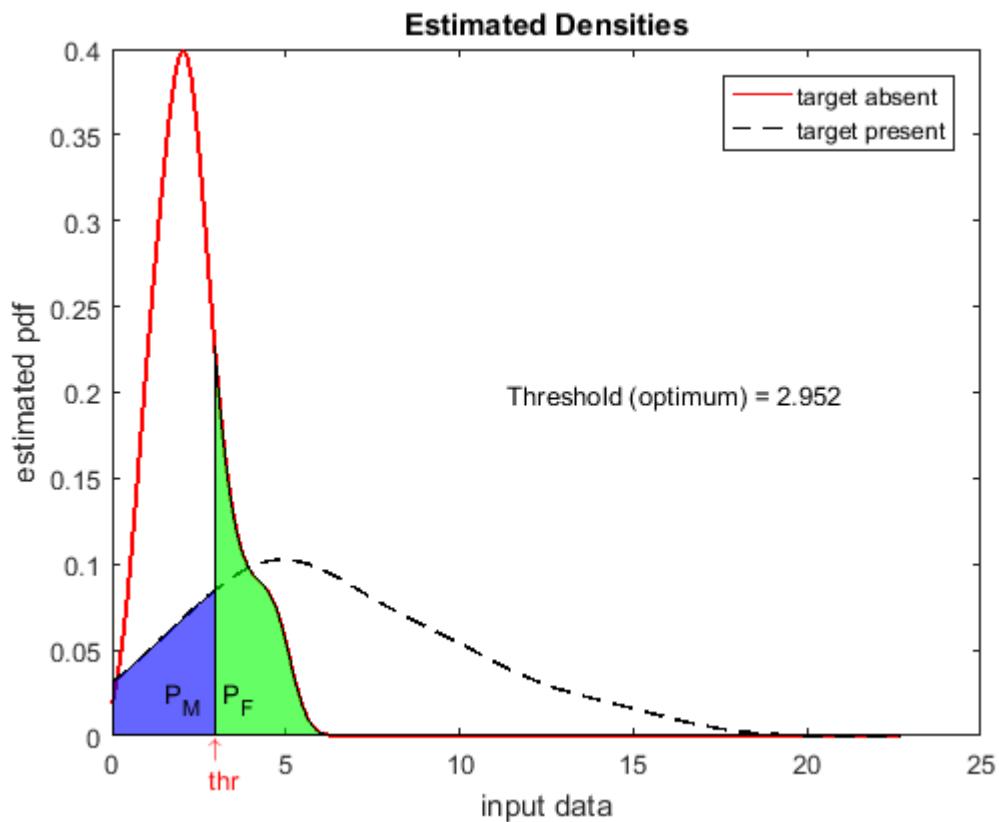
$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{9}{10} & \frac{4}{15} \\ \frac{1}{10} & \frac{11}{15} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.9 & 0.26667 \\ 0.1 & 0.7333 \end{bmatrix}$$

$$P_F = \frac{1}{10} = 0.1 \quad P_M = \frac{4}{15} = 0.26667 \quad \text{PPV} = \frac{11}{13} = 0.84615$$

p m shankar





Confusion Matrix : Threshold (optimum) = 2.952

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	8	32
	Target Present	25	5
	Total Counts	33	37

dist to top left corner of the ROC curve = 0.26

Transition Matrix: Threshold (optimum) = 2.952

$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{4}{5} & \frac{1}{6} \\ \frac{1}{5} & \frac{5}{6} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.8 & 0.1667 \\ 0.2 & 0.8333 \end{bmatrix}$$

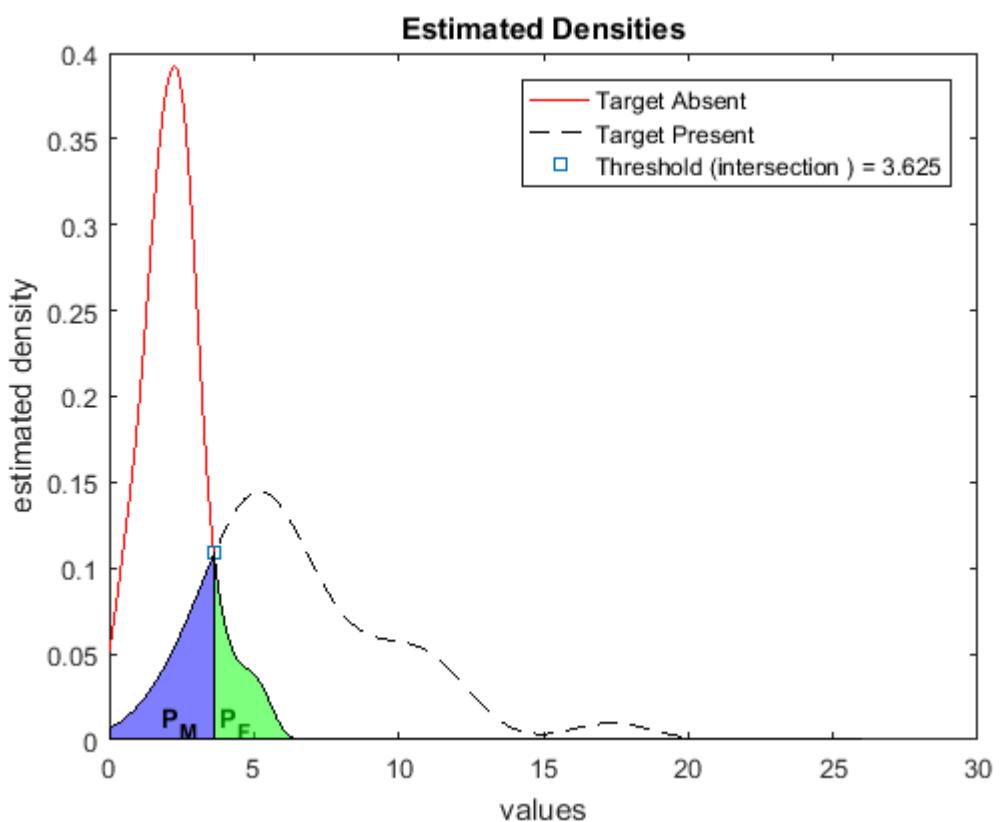
$$P_F = \frac{1}{5} = 0.2 \quad P_M = \frac{1}{6} = 0.16667 \quad \text{PPV} = \frac{25}{33} = 0.75758$$

p m shankar

data (Karch)

Target Absent					Target Present				
0.753	2.667	0.077	2.049	2.725	5.034	17.343	3.633	5.114	11.697
1.805	2.932	2.094	1.534	3.352	9.517	7.23	6.109	8.597	5.222
1.641	1.596	1.934	3.724	2.37	4.429	9.902	3.322	6.368	7.454
1.544	1.889	2.501	1.55	1.385	6.569	4.839	7.78	10.374	5.568
4.04	3.234	4.681	0.986	2.925	5.815	3.001	5.454	10.94	5.036
2.493	0.74	2.207	2.562	2.944	3.253	4.039	1.772	11.709	4.961
1.592	1.876	2.636	0.947	5.275					
2.344	0.464	2.61	2.585	2.204					

(c) P. M. Shankar



Confusion Matrix: Threshold (intersection) = 3.625

Data Collected	Target Detected	Target Not Detected	Total Counts
Target Absent	4	36	40
Target Present	26	4	30
Total Counts	30	40	70

Errors circled

dist to top left corner of the ROC curve = 0.167

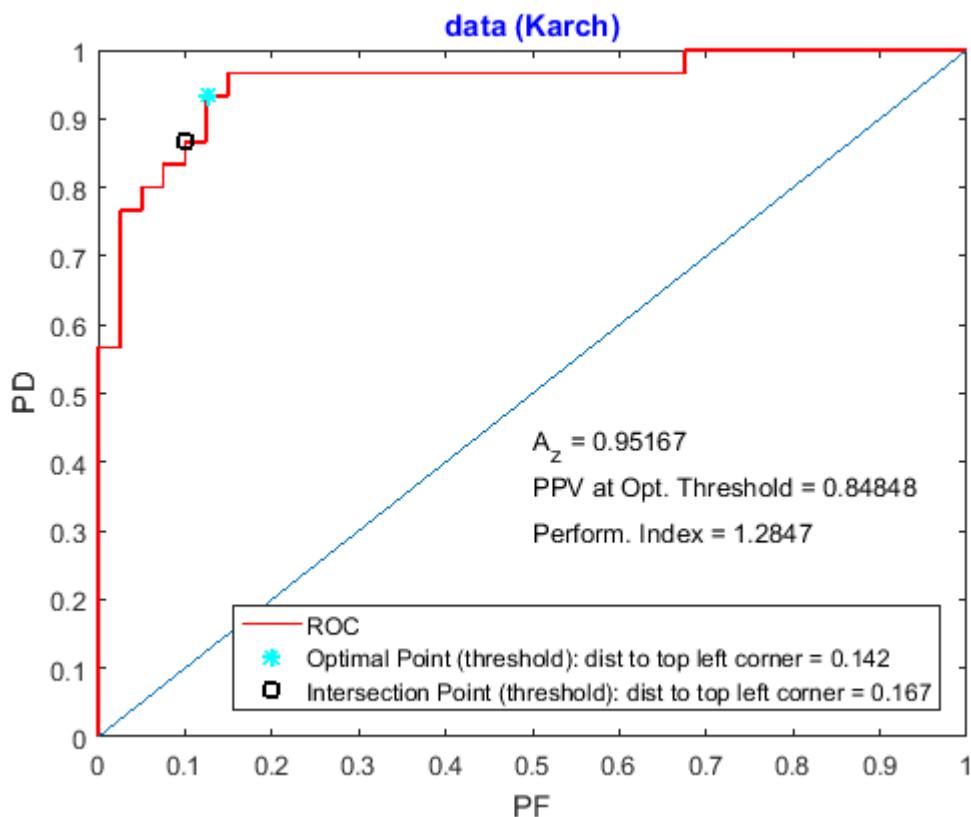
Transition Matrix: Threshold (intersection) = 3.625

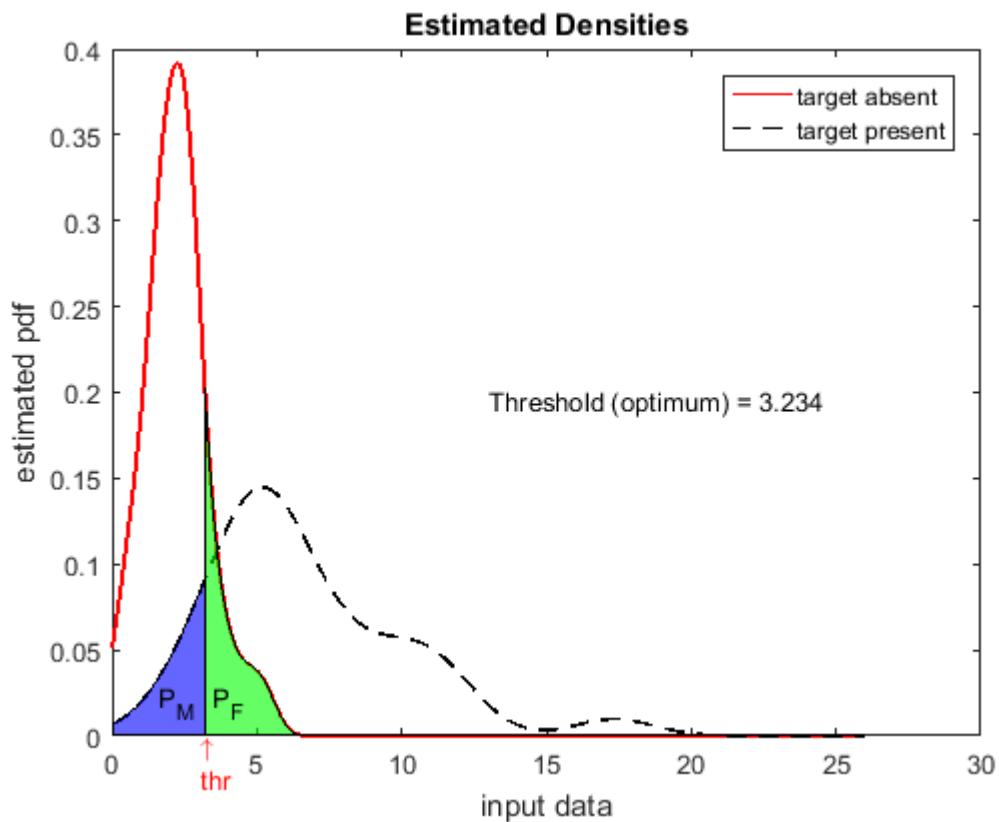
$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{9}{10} & \frac{2}{15} \\ \frac{1}{10} & \frac{13}{15} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.9 & 0.1333 \\ 0.1 & 0.8667 \end{bmatrix}$$

$$P_F = \frac{1}{10} = 0.1 \quad P_M = \frac{2}{15} = 0.1333 \quad \text{PPV} = \frac{13}{15} = 0.86667$$

p m shankar





Confusion Matrix : Threshold (optimum) = 3.234

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	5	35
	Target Present	28	2
	Total Counts	33	37

dist to top left corner of the ROC curve = 0.142

Transition Matrix: Threshold (optimum) = 3.234

$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{7}{8} & \frac{1}{15} \\ \frac{1}{8} & \frac{14}{15} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.875 & 0.0667 \\ 0.125 & 0.9333 \end{bmatrix}$$

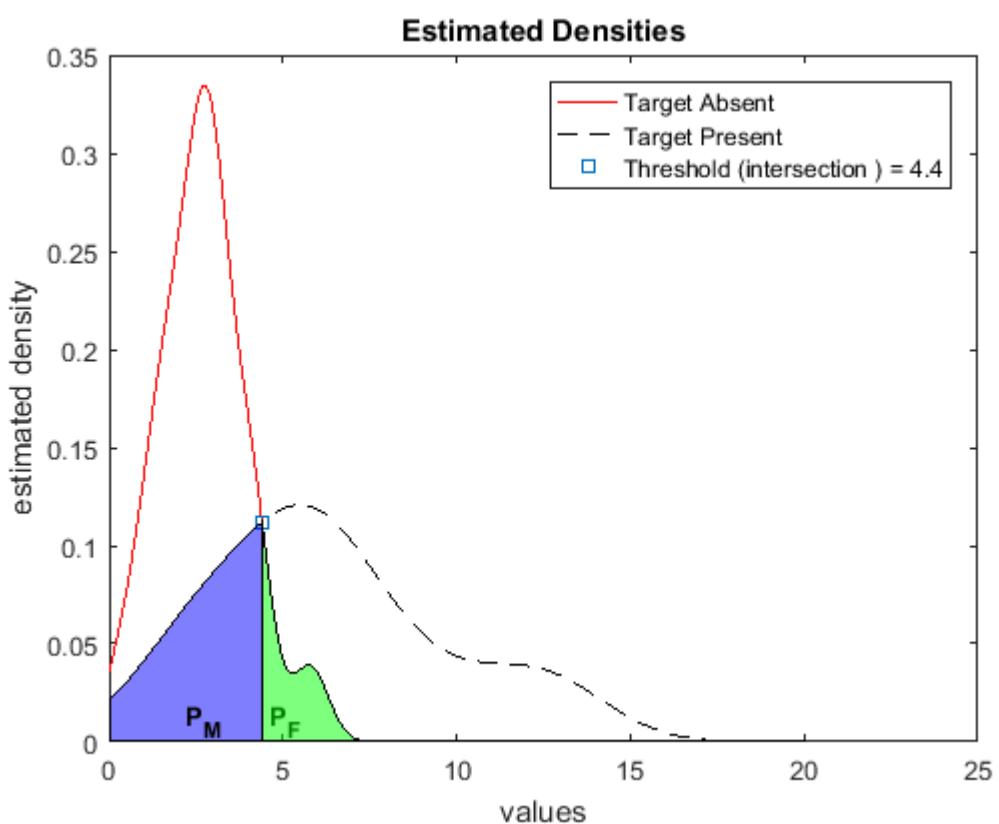
$$P_F = \frac{1}{8} = 0.125 \quad P_M = \frac{1}{15} = 0.06667 \quad \text{PPV} = \frac{28}{33} = 0.84848$$

p m shankar

data (Karna)

Target Absent					Target Present				
1.619	2.706	1.754	1.508	0.954	3.112	6.051	13.388	2.126	12.644
2.638	4.29	2.156	0.586	4.214	3.227	11.476	9.855	10.663	2.428
3.445	1.804	1.11	2.615	0.189	3.239	5.678	8.321	5.633	7.596
3.992	1.707	4.048	3.1	2.412	5.231	5.827	3.885	7.371	7.86
3.189	2.795	2.822	4.19	2.632	4.386	12.817	5.372	6.451	1.918
2.921	1.496	1.195	3.308	2.116	5.214	7.057	5.659	1.197	5.297
3.031	5.758	2.377	5.813	2.796					
3.987	3.409	3.122	2.752	2.219					

(c) P. M. Shankar



Confusion Matrix: Threshold (intersection) = 4.4

Data Collected	Target Detected	Target Not Detected	Total Counts
Target Absent	2	38	40
Target Present	21	9	30
Total Counts	23	47	70

Errors circled

dist to top left corner of the ROC curve = 0.304

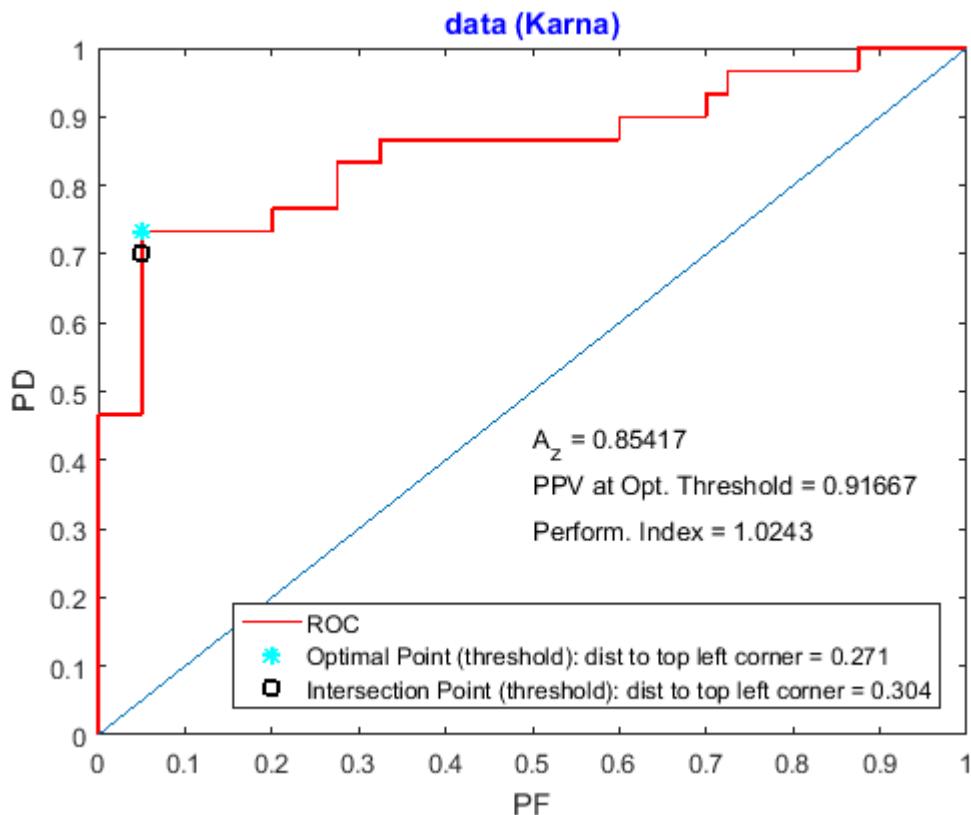
Transition Matrix: Threshold (intersection) = 4.4

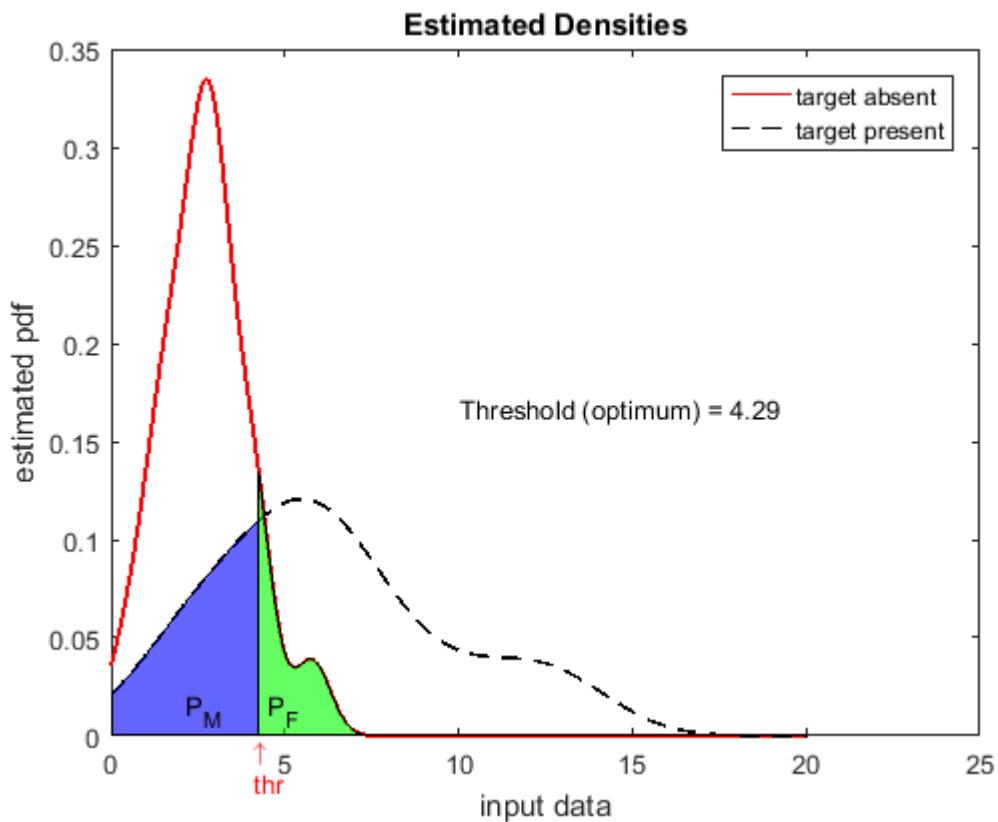
$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{19}{20} & \frac{3}{10} \\ \frac{1}{20} & \frac{7}{10} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.95 & 0.3 \\ 0.05 & 0.7 \end{bmatrix}$$

$$P_F = \frac{1}{20} = 0.05 \quad P_M = \frac{3}{10} = 0.3 \quad \text{PPV} = \frac{21}{23} = 0.91304$$

p m shankar





Confusion Matrix : Threshold (optimum) = 4.29

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	2	38
	Target Present	22	8
	Total Counts	24	46

dist to top left corner of the ROC curve = 0.271

Transition Matrix: Threshold (optimum) = 4.29

$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{19}{20} & \frac{4}{15} \\ \frac{1}{20} & \frac{11}{15} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.95 & 0.26667 \\ 0.05 & 0.7333 \end{bmatrix}$$

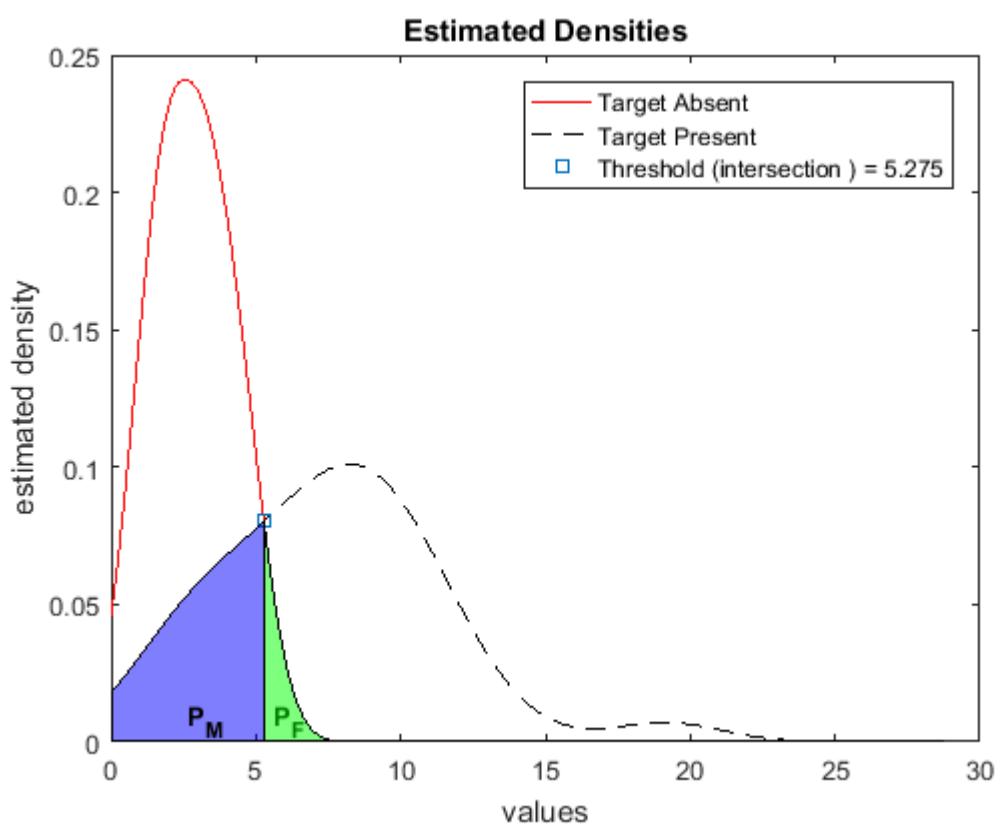
$$P_F = \frac{1}{20} = 0.05 \quad P_M = \frac{4}{15} = 0.26667 \quad \text{PPV} = \frac{11}{12} = 0.91667$$

p m shankar

data (Khoa)

Target Absent					Target Present				
1.713	1.823	4.573	2.568	2.064	8.708	10.625	7.995	8.127	10.413
4.46	5.691	3.545	3.009	2.327	6.653	2.975	13.302	1.335	11.265
3.803	4.891	4.219	0.572	2.345	6.846	6.076	10.79	8.417	5.686
4.12	1.336	4.061	2.216	3.306	10.25	11.119	8.628	19.169	2.964
1.069	3.167	1.386	1.871	0.611	2.682	4.327	9.226	8.882	7.216
4.632	3.287	1.997	4.936	3.133	5.616	7.947	1.864	4.704	4.392
1.761	0.713	3.589	3.693	2.728					
2.412	1.501	3.182	1.472	2.975					

(c) P. M. Shankar



Confusion Matrix: Threshold (intersection) = 5.275

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	1	39
	Target Present	22	8
	Total Counts	23	47

dist to top left corner of the ROC curve = 0.268

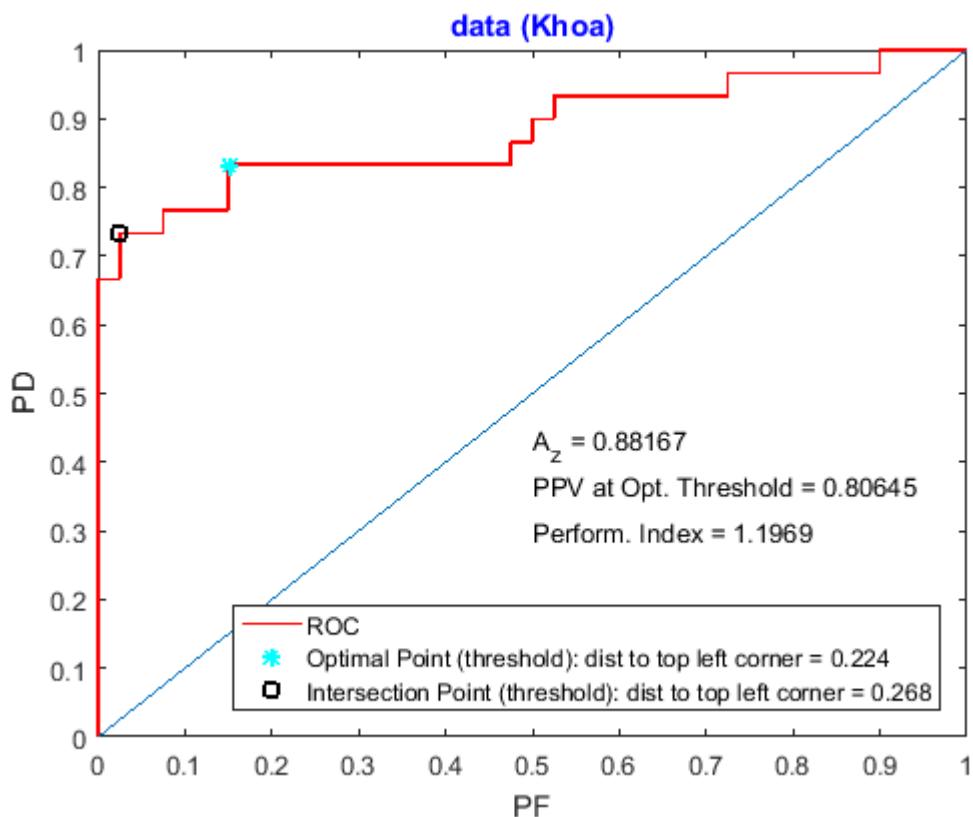
Transition Matrix: Threshold (intersection) = 5.275

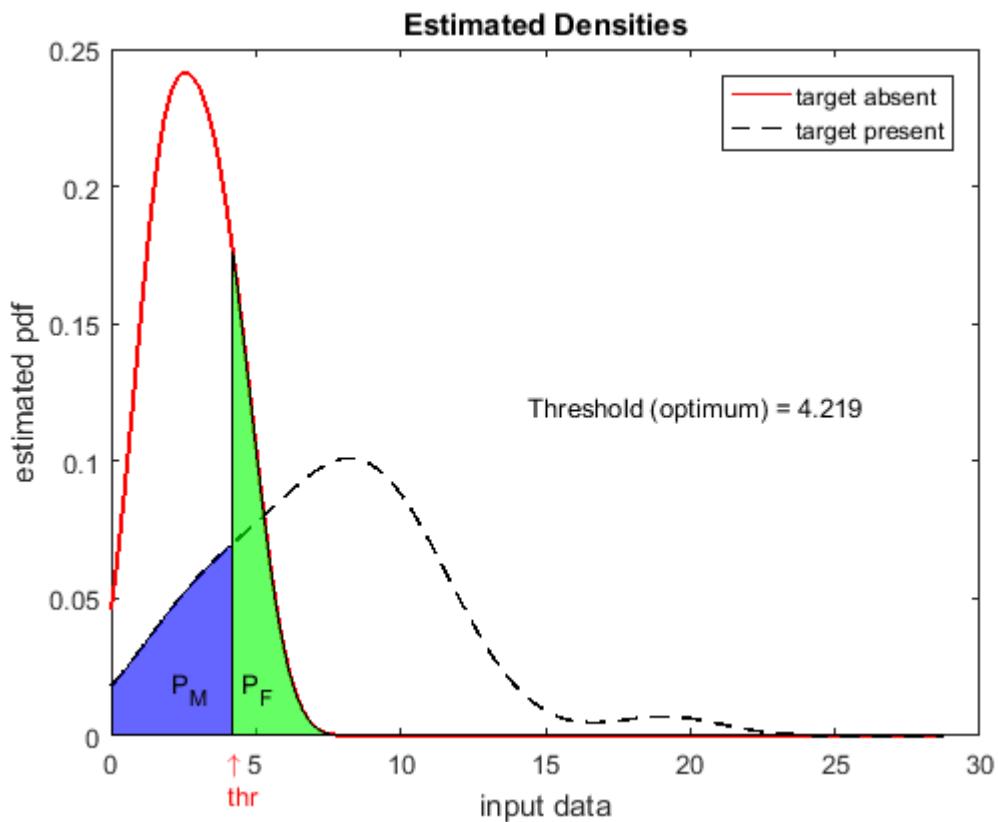
$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{39}{40} & \frac{4}{15} \\ \frac{1}{40} & \frac{11}{15} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.975 & 0.26667 \\ 0.025 & 0.7333 \end{bmatrix}$$

$$P_F = \frac{1}{40} = 0.025 \quad P_M = \frac{4}{15} = 0.26667 \quad \text{PPV} = \frac{22}{23} = 0.95652$$

p m shankar





Confusion Matrix : Threshold (optimum) = 4.219

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	6	34
	Target Present	25	5
	Total Counts	31	39

dist to top left corner of the ROC curve = 0.224

Transition Matrix: Threshold (optimum) = 4.219

$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{17}{20} & \frac{1}{6} \\ \frac{3}{20} & \frac{5}{6} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.85 & 0.16667 \\ 0.15 & 0.8333 \end{bmatrix}$$

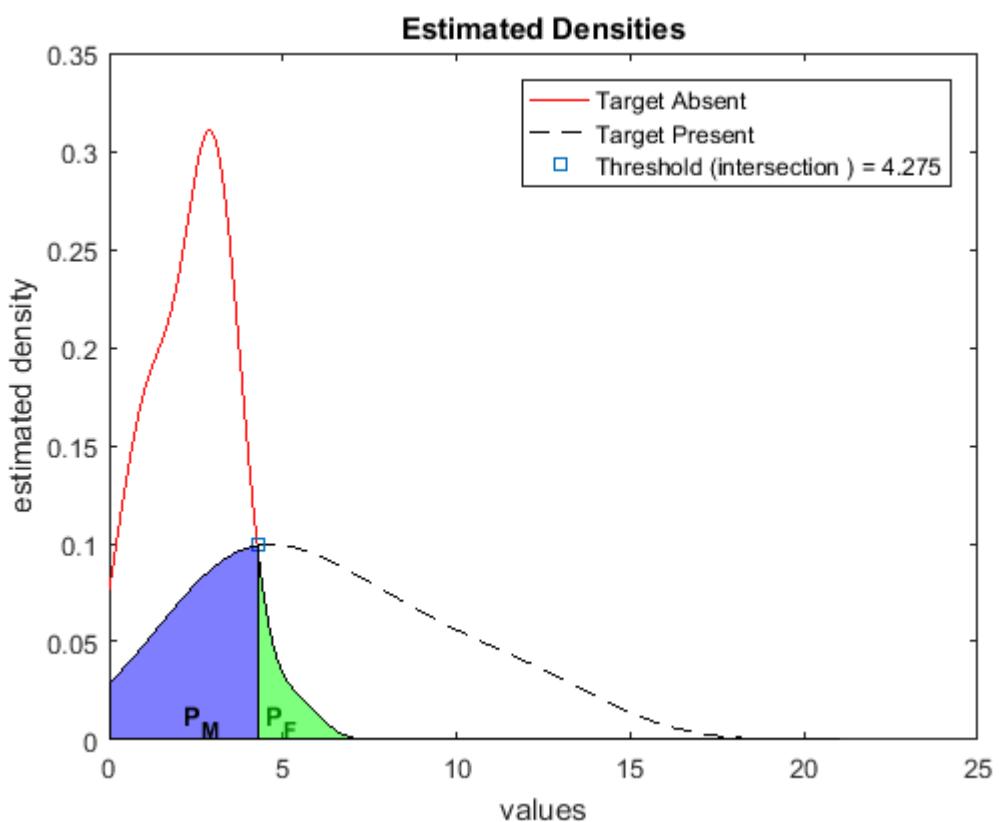
$$P_F = \frac{3}{20} = 0.15 \quad P_M = \frac{1}{6} = 0.16667 \quad \text{PPV} = \frac{25}{31} = 0.80645$$

p m shankar

data (Laudando)

Target Absent					Target Present				
3.035	0.868	1.477	5.535	3.165	12.015	9.05	0.606	7.415	5.307
3.178	2.767	3.175	2.628	2.437	7.791	3.881	2.108	2.624	3.734
0.48	2.441	0.628	3.73	3.733	14.022	8.661	5.467	3.944	4.899
3.578	2.703	1.56	2.691	0.158	10.349	2.491	12.295	8.392	11.989
1.421	3.142	0.922	2.862	4.563	5.744	5.787	5.682	3.285	3
3.553	3.633	1.877	1.98	2.49	3.72	9.975	6.337	7.514	2.388
3.323	2.541	2.55	1.162	0.313					
2.913	0.906	1.531	1.539	3.275					

(c) P. M. Shankar



Confusion Matrix: Threshold (intersection) = 4.275

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	2	38
	Target Present	19	11
	Total Counts	21	49

dist to top left corner of the ROC curve = 0.37

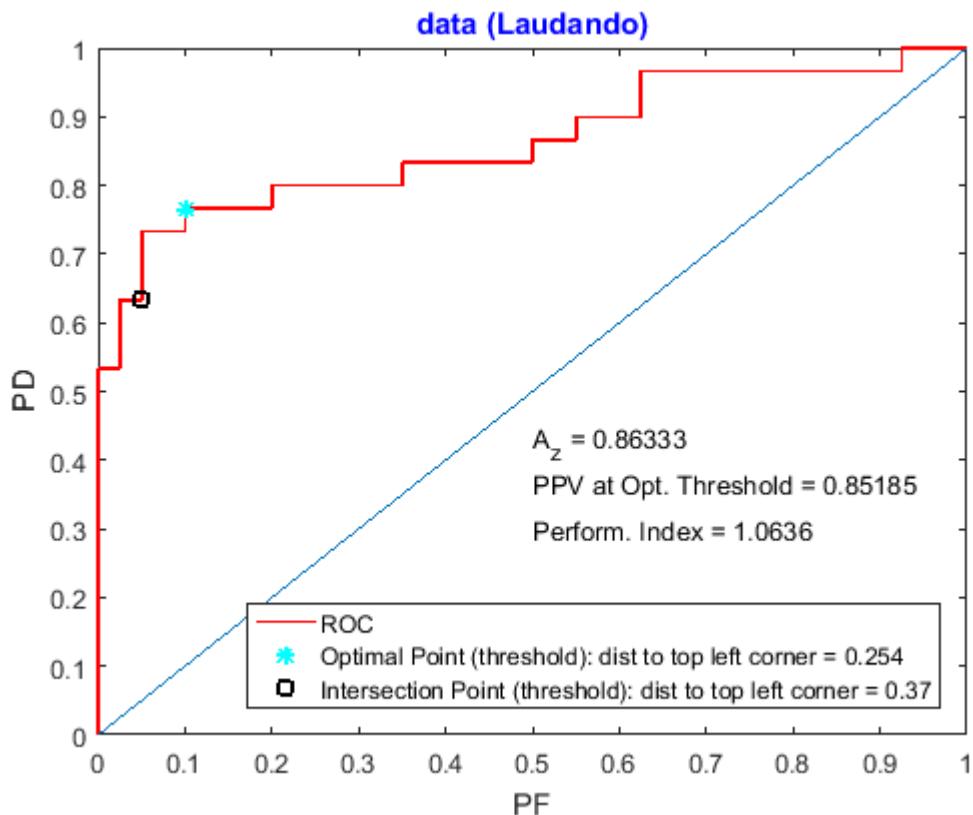
Transition Matrix: Threshold (intersection) = 4.275

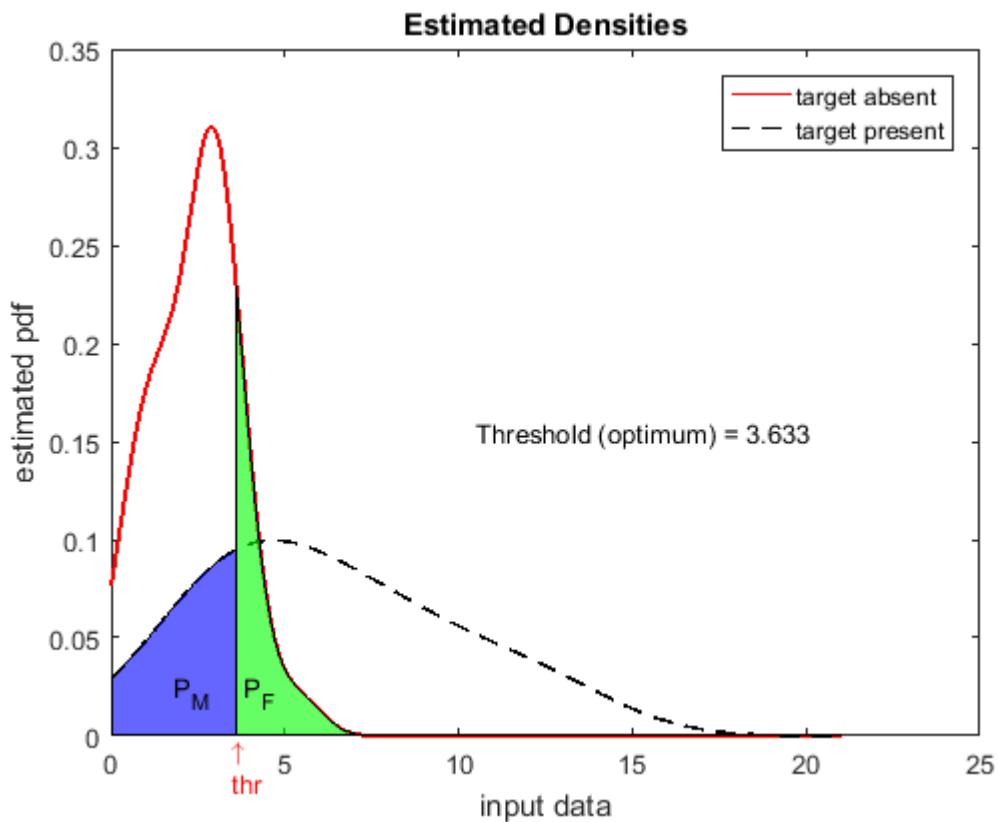
$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{19}{20} & \frac{11}{30} \\ \frac{1}{20} & \frac{19}{30} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.95 & 0.36667 \\ 0.05 & 0.63333 \end{bmatrix}$$

$$P_F = \frac{1}{20} = 0.05 \quad P_M = \frac{11}{30} = 0.36667 \quad \text{PPV} = \frac{19}{21} = 0.90476$$

p m shankar





Confusion Matrix : Threshold (optimum) = 3.633

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent 4	36	40
	23	7	30
	27	43	70

dist to top left corner of the ROC curve = 0.254

Transition Matrix: Threshold (optimum) = 3.633

$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{9}{10} & \frac{7}{30} \\ \frac{1}{10} & \frac{23}{30} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.9 & 0.2333 \\ 0.1 & 0.7667 \end{bmatrix}$$

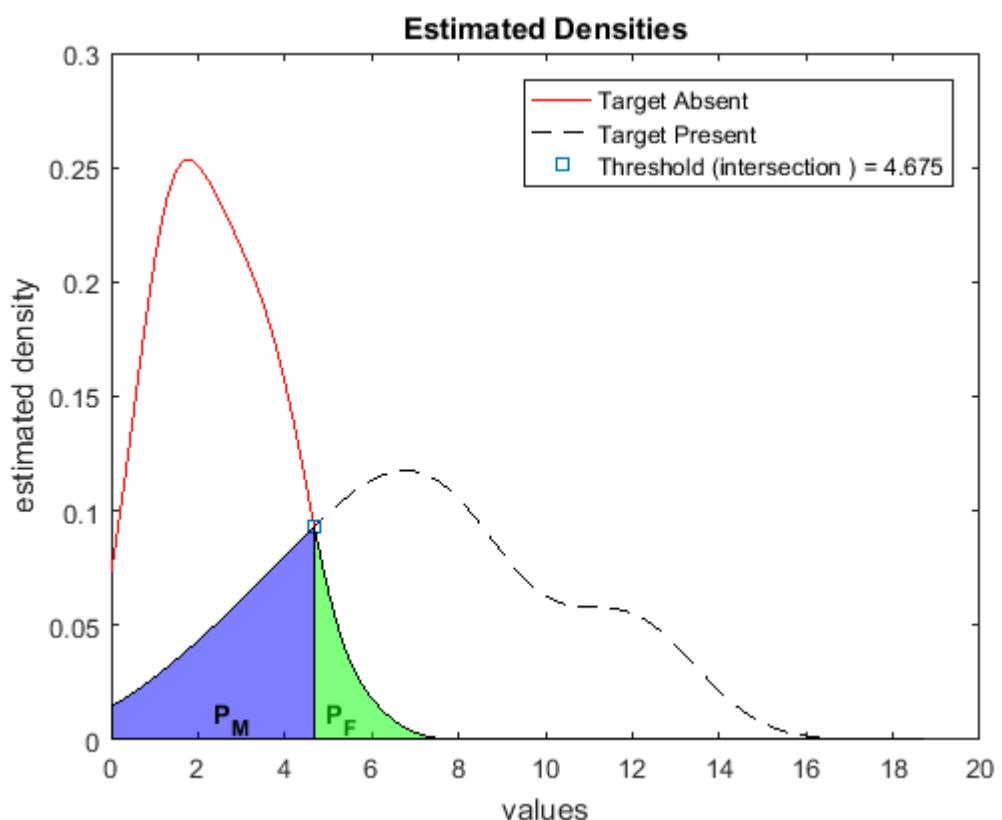
$$P_F = \frac{1}{10} = 0.1 \quad P_M = \frac{7}{30} = 0.2333 \quad \text{PPV} = \frac{23}{27} = 0.85185$$

p m shankar

data (Lechman)

Target Absent					Target Present				
2.94	1.621	4.601	4.17	0.984	4.8	5.372	8.132	11.308	9.632
3.939	4.087	1.548	1.752	0.987	6.628	6.44	4.153	12.246	3.282
0.466	1.289	2.652	0.173	1.659	8.58	6.215	8.037	6.06	6.049
4.031	2.717	1.488	5.708	2.848	5.285	12.226	12.196	2.719	7.924
2.758	4.324	0.845	0.974	2.288	2.08	8.172	3.399	4.862	0.736
1.996	1.601	1.255	3.243	3.67	12.483	11.052	7.745	7.807	7.089
1.891	3.858	1.015	2.938	1.828					
1.242	3.263	2.498	2.507	3.5					

(c) P. M. Shankar



Confusion Matrix: Threshold (intersection) = 4.675

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	1	39
	Target Present	24	6
	Total Counts	25	45

dist to top left corner of the ROC curve = 0.202

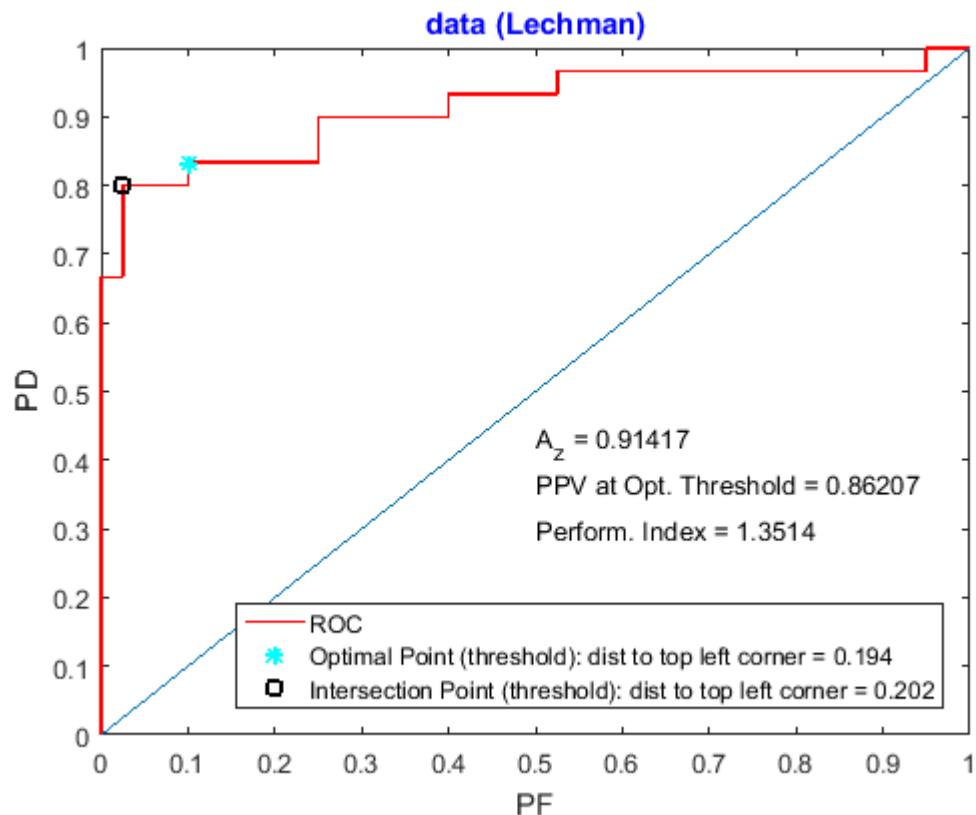
Transition Matrix: Threshold (intersection) = 4.675

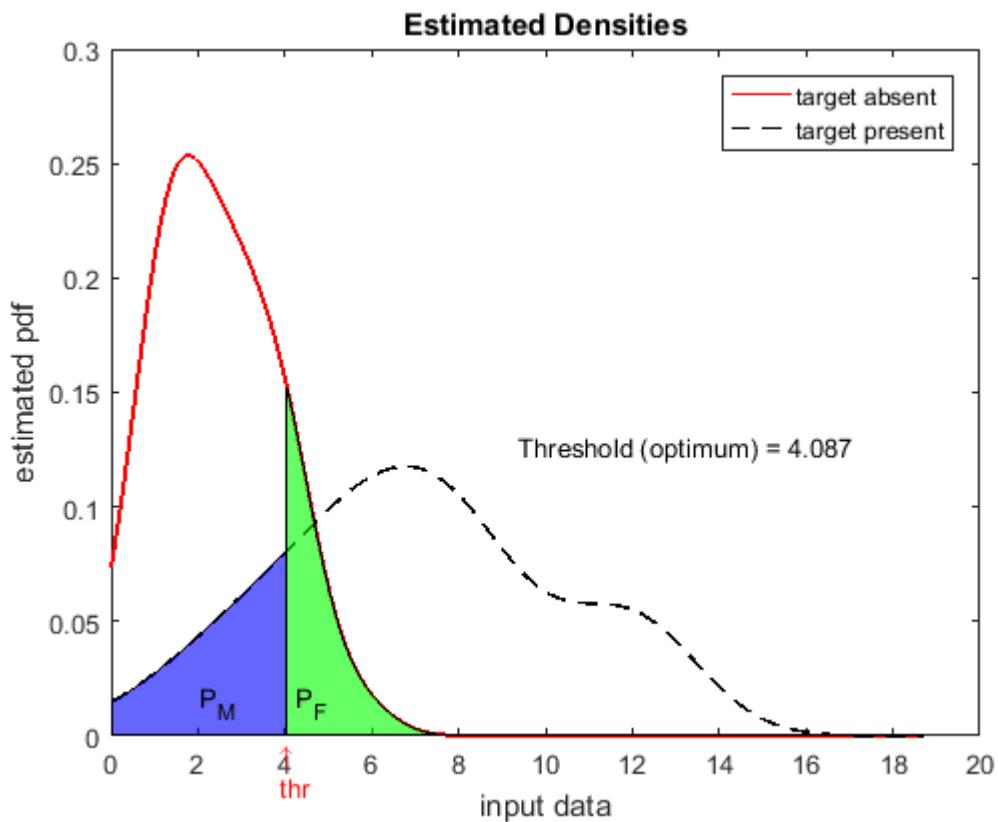
$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{39}{40} & \frac{1}{5} \\ \frac{1}{40} & \frac{4}{5} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.975 & 0.2 \\ 0.025 & 0.8 \end{bmatrix}$$

$$P_F = \frac{1}{40} = 0.025 \quad P_M = \frac{1}{5} = 0.2 \quad \text{PPV} = \frac{24}{25} = 0.96$$

p m shankar





Confusion Matrix : Threshold (optimum) = 4.087

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	4	36
	Target Present	25	5
	Total Counts	29	41

dist to top left corner of the ROC curve = 0.194

Transition Matrix: Threshold (optimum) = 4.087

$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

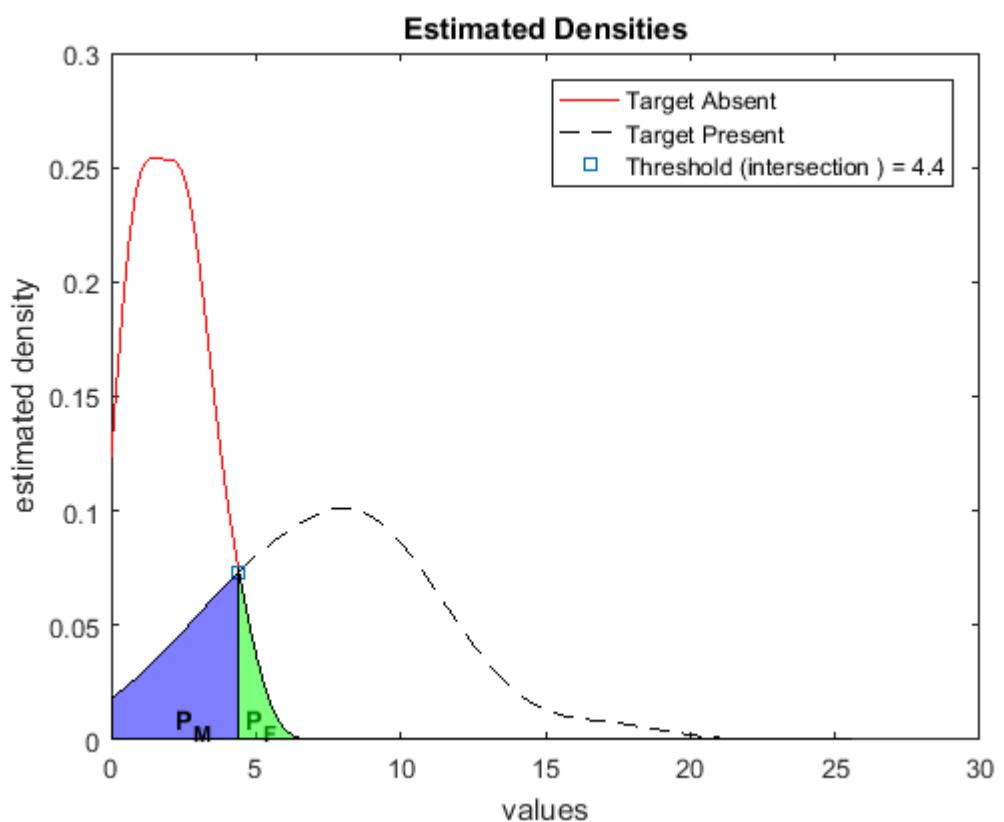
$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{9}{10} & \frac{1}{6} \\ \frac{1}{10} & \frac{5}{6} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.9 & 0.1667 \\ 0.1 & 0.8333 \end{bmatrix}$$

$$P_F = \frac{1}{10} = 0.1 \quad P_M = \frac{1}{6} = 0.16667 \quad \text{PPV} = \frac{25}{29} = 0.86207$$

p m shankar

data (Li)									
Target Absent					Target Present				
2.337	2.879	1.479	2.255	0.582	12.912	6.421	5.144	7.582	9.451
2.847	2.646	3.11	2.593	2.44	8.368	9.1	11.635	4.179	0.896
0.595	0.24	0.876	3.479	1.88	9.226	8.755	11.91	4.093	9.224
3.945	2.663	1.795	1.414	1.341	4.865	10.051	6.948	3.084	4.688
2.843	2.347	0.656	1.049	0.791	7.948	1.016	7.211	7.632	5.203
1.797	2.99	4.583	3.987	0.816	17.05	3.33	10.819	7.023	10.448
0.367	4.575	0.97	0.438	0.908					
2.473	1.301	3.447	2.182	0.714					

(c) P. M. Shankar



Confusion Matrix: Threshold (intersection) = 4.4

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	2	38
	Target Present	24	6
	Total Counts	26	44

dist to top left corner of the ROC curve = 0.206

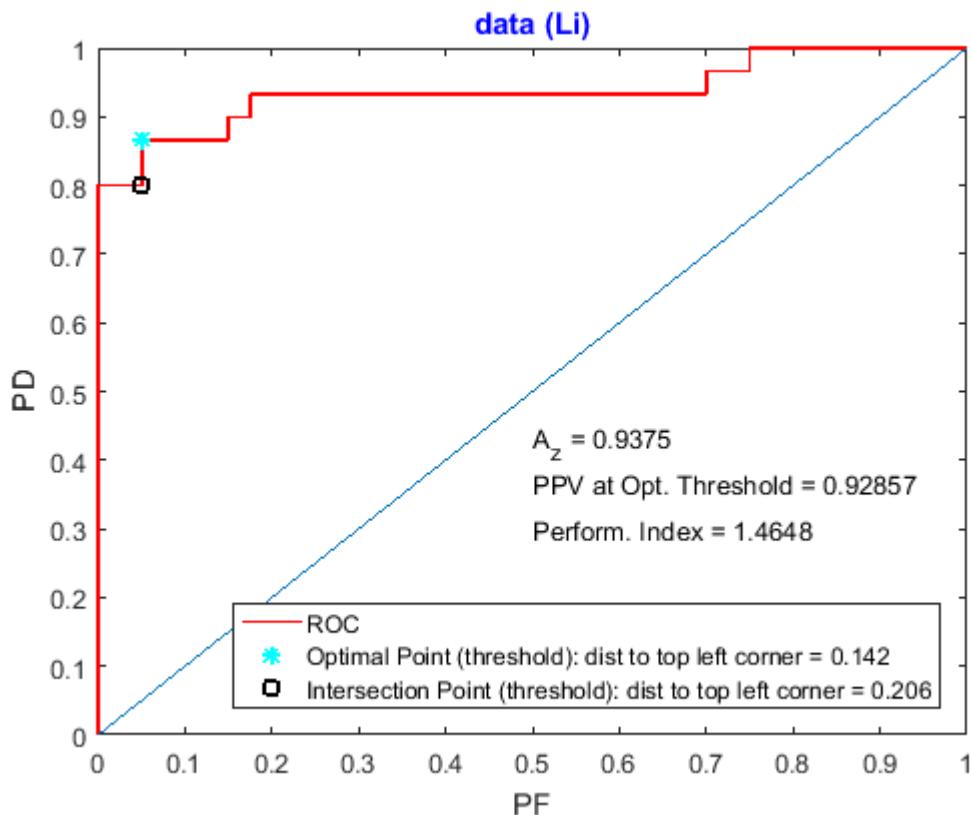
Transition Matrix: Threshold (intersection) = 4.4

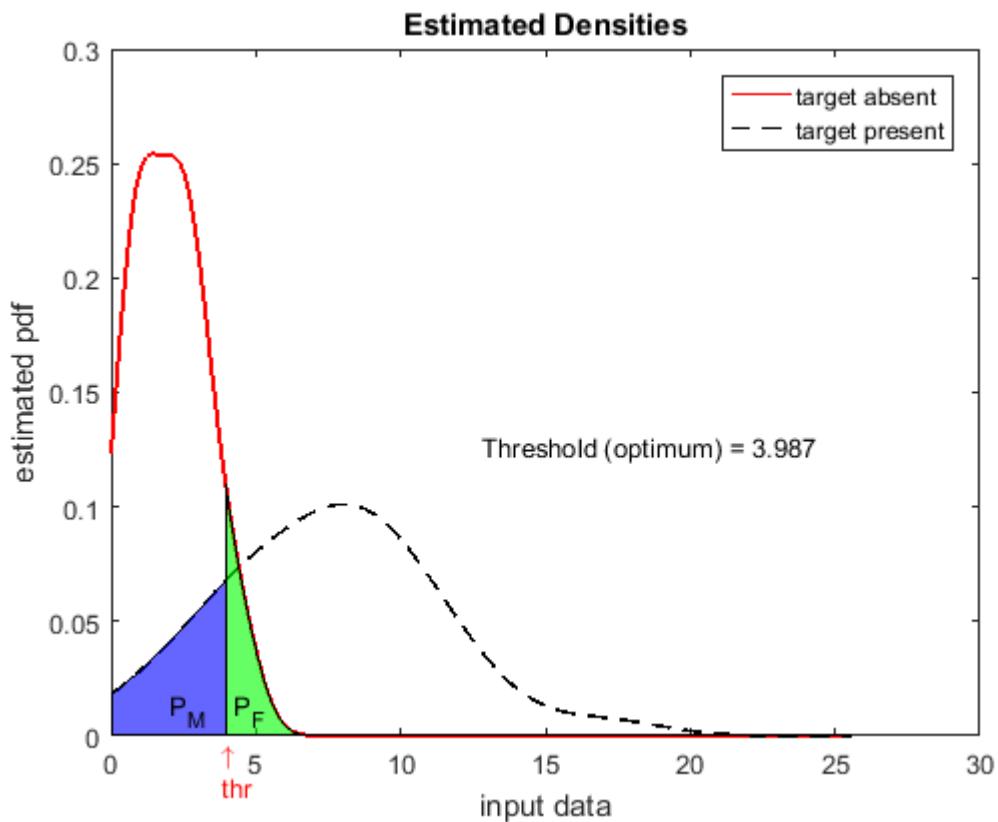
$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{19}{20} & \frac{1}{5} \\ \frac{1}{20} & \frac{4}{5} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.95 & 0.2 \\ 0.05 & 0.8 \end{bmatrix}$$

$$P_F = \frac{1}{20} = 0.05 \quad P_M = \frac{1}{5} = 0.2 \quad \text{PPV} = \frac{12}{13} = 0.92308$$

p m shankar





Confusion Matrix : Threshold (optimum) = 3.987

	Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	2	38	40
	Target Present	26	4	30
	Total Counts	28	42	70

dist to top left corner of the ROC curve = 0.142

Transition Matrix: Threshold (optimum) = 3.987

$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{19}{20} & \frac{2}{15} \\ \frac{1}{20} & \frac{13}{15} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.95 & 0.1333 \\ 0.05 & 0.8667 \end{bmatrix}$$

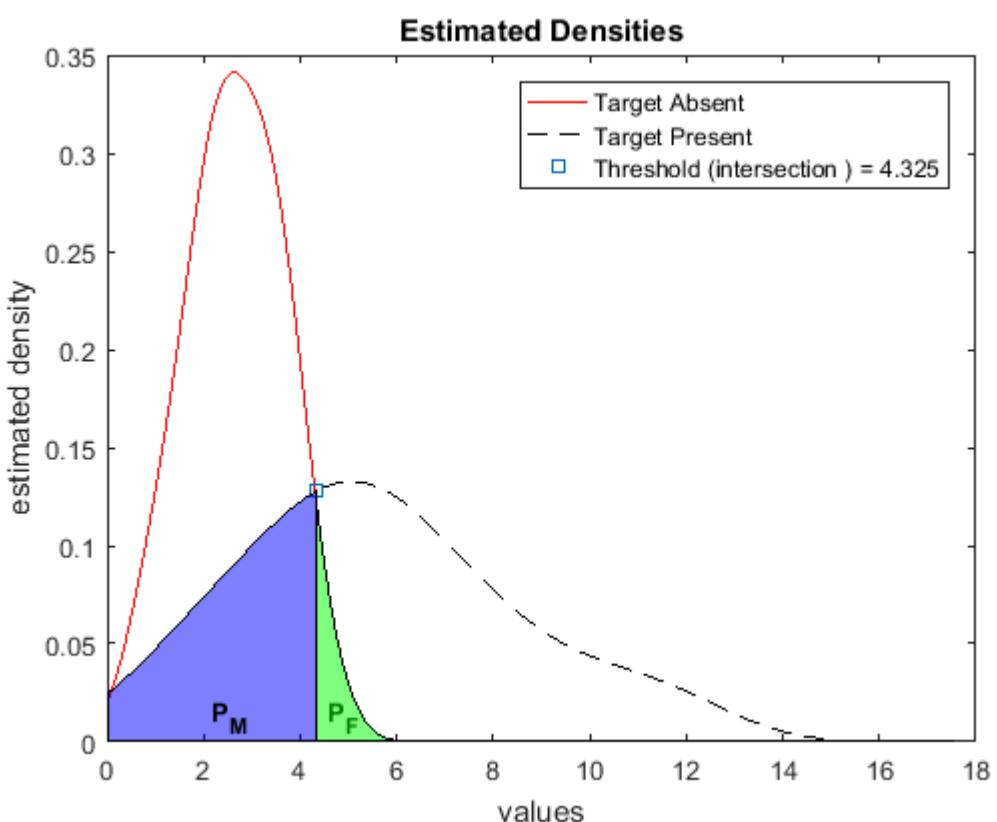
$$P_F = \frac{1}{20} = 0.05 \quad P_M = \frac{2}{15} = 0.1333 \quad \text{PPV} = \frac{13}{14} = 0.92857$$

p m shankar

data (Liao)

Target Absent					Target Present				
3.619	3.077	2.56	1.417	1.825	8.198	6.623	1.445	10.127	11.697
3.469	1.628	2.273	2.676	3.695	2.471	6.87	4.882	8.441	3.346
4.604	3.136	4.202	3.004	0.742	11.721	5.702	2.613	7.35	2.865
2.319	2.826	2.833	2.334	3.327	0.705	4.638	4.881	4.175	5.68
3.843	1.161	2.498	3.556	0.699	4.891	1.746	4.578	6.127	5.984
2.019	3.56	2.374	1.596	3.325	6.196	7.901	3.739	9.72	4.118
3.816	1.914	2.119	2.55	2.728					
3.99	1.895	2.113	1.11	3.278					

(c) P. M. Shankar



Confusion Matrix: Threshold (intersection) = 4.325

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	1	39
	Target Present	20	10
	Total Counts	21	49

dist to top left corner of the ROC curve = 0.334

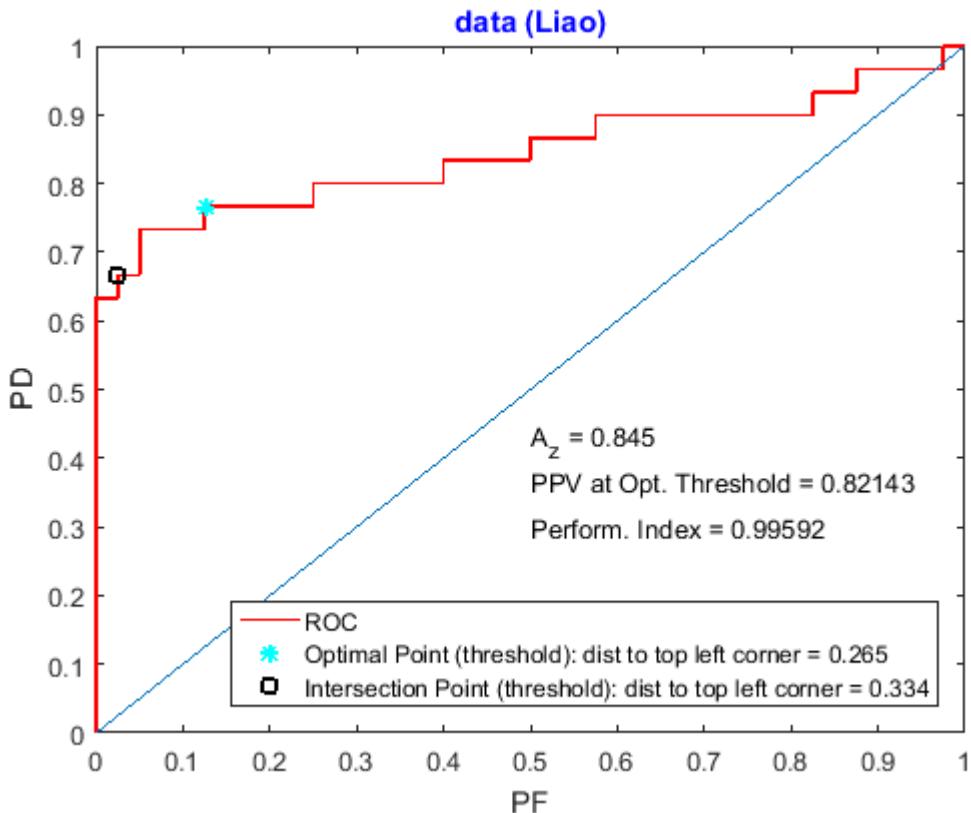
Transition Matrix: Threshold (intersection) = 4.325

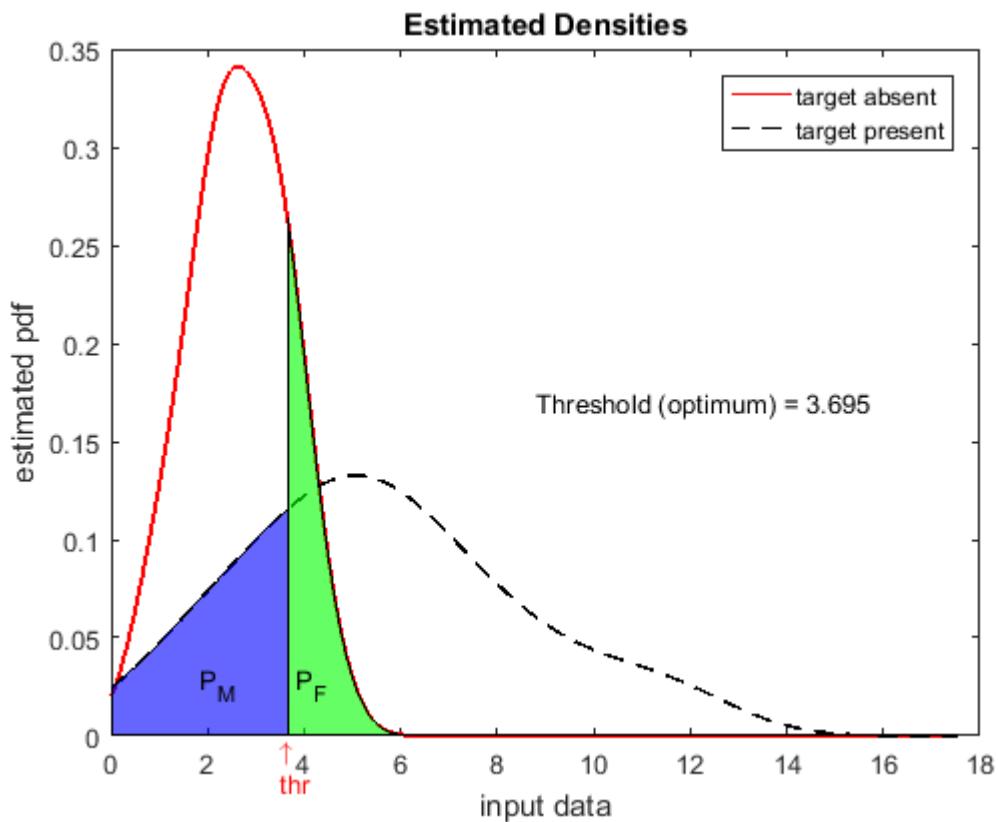
$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{39}{40} & \frac{1}{3} \\ \frac{1}{40} & \frac{2}{3} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.975 & 0.3333 \\ 0.025 & 0.6667 \end{bmatrix}$$

$$P_F = \frac{1}{40} = 0.025 \quad P_M = \frac{1}{3} = 0.33333 \quad \text{PPV} = \frac{20}{21} = 0.95238$$

p m shankar





Confusion Matrix : Threshold (optimum) = 3.695

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	5	35
	Target Present	23	7
	Total Counts	28	42

dist to top left corner of the ROC curve = 0.265

Transition Matrix: Threshold (optimum) = 3.695

$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{7}{8} & \frac{7}{30} \\ \frac{1}{8} & \frac{23}{30} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.875 & 0.2333 \\ 0.125 & 0.7667 \end{bmatrix}$$

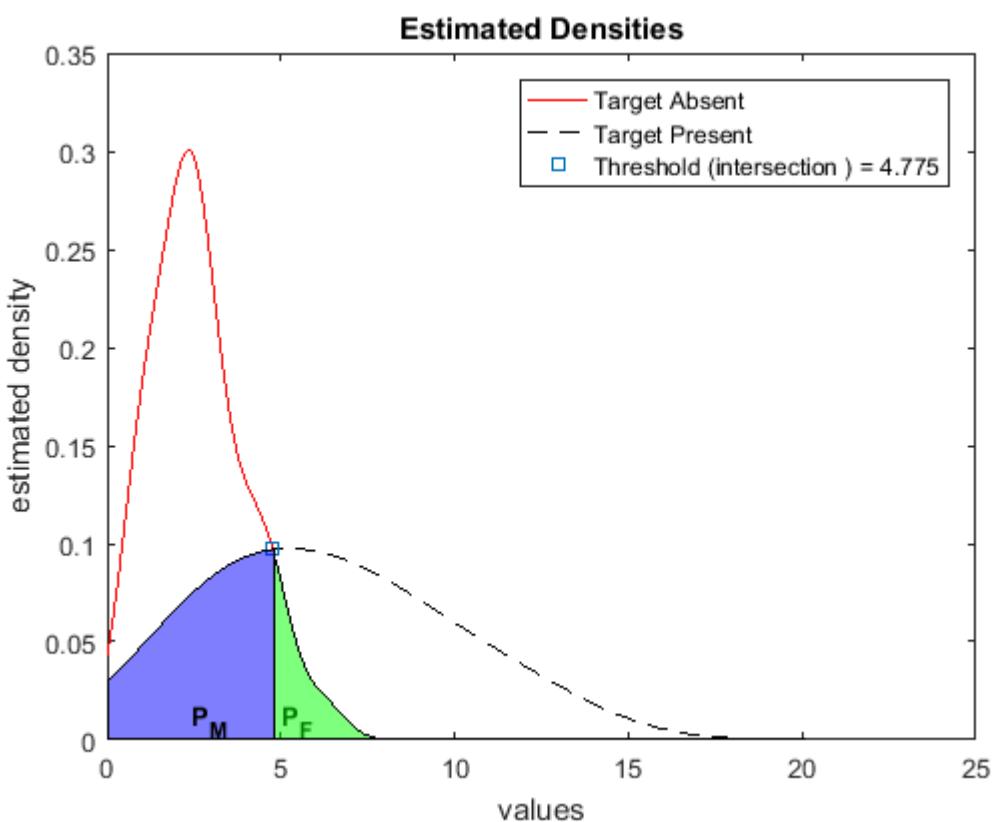
$$P_F = \frac{1}{8} = 0.125 \quad P_M = \frac{7}{30} = 0.2333 \quad \text{PPV} = \frac{23}{28} = 0.82143$$

p m shankar

data (Liston)

Target Absent					Target Present				
1.882	2.524	2.845	1.961	2.728	5.634	2.955	2.283	5.049	7.526
2.328	3.616	2.908	0.812	2.407	4.338	9.131	2.084	8.992	11.334
4.71	2.556	3.939	4.55	2.112	12.138	5.792	5.349	10.052	7.097
6.283	3.986	2.172	3.592	0.893	3.17	3.963	6.162	3.204	0.486
2.826	1.23	2.469	2.628	2.601	8.59	6.102	13.417	4.065	7.777
1.812	1.199	0.978	1.221	4.659	11.233	2.893	6.736	2.348	8.235
4.536	2.184	3.424	1.828	1.261					
0.466	1.891	2.924	5.254	0.944					

(c) P. M. Shankar



Confusion Matrix: Threshold (intersection) = 4.775

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	2	38
	Target Present	19	11
	Total Counts	21	49

dist to top left corner of the ROC curve = 0.37

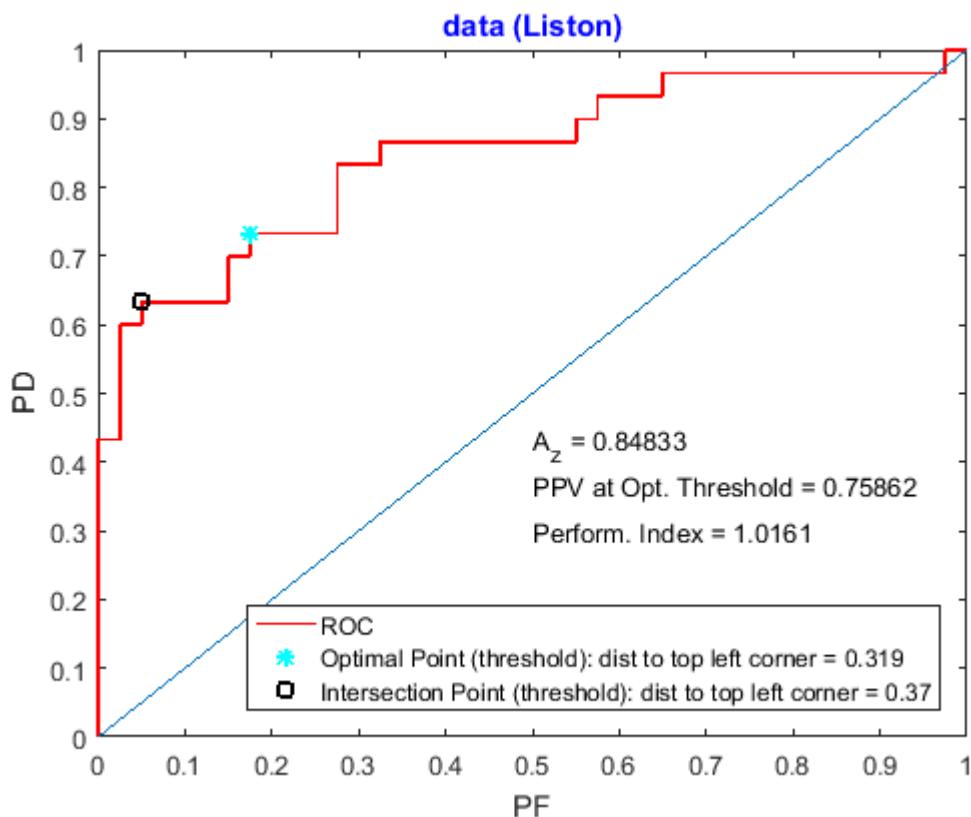
Transition Matrix: Threshold (intersection) = 4.775

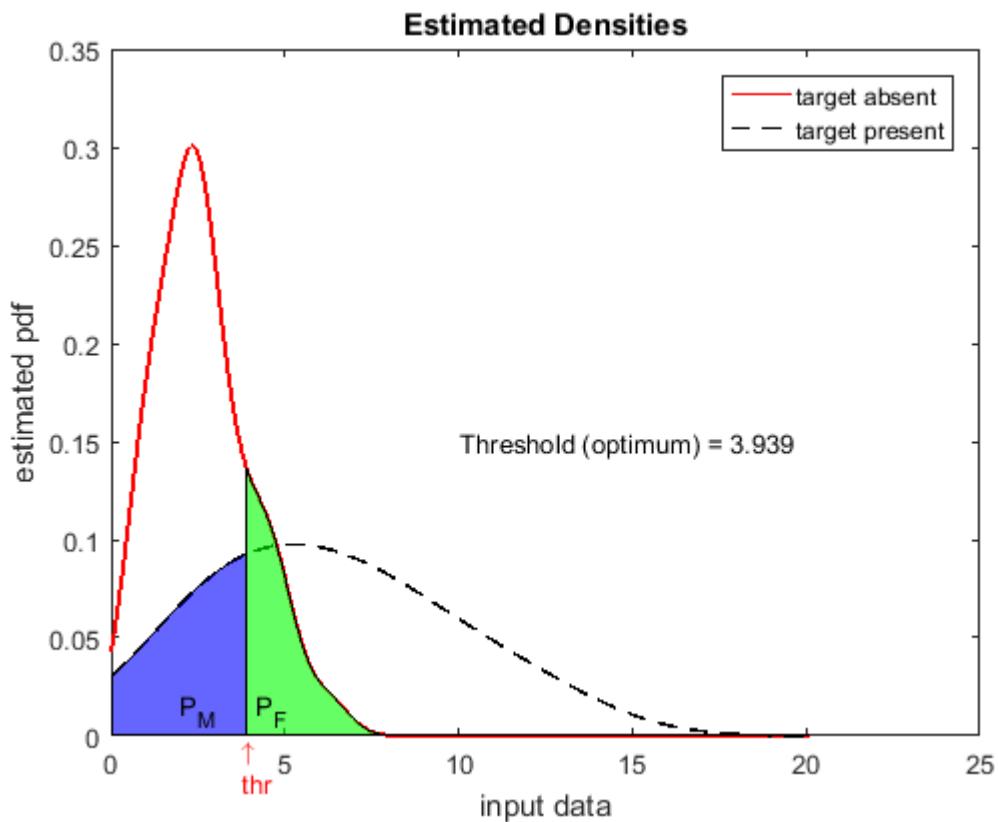
$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{19}{20} & \frac{11}{30} \\ \frac{1}{20} & \frac{19}{30} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.95 & 0.36667 \\ 0.05 & 0.6333 \end{bmatrix}$$

$$P_F = \frac{1}{20} = 0.05 \quad P_M = \frac{11}{30} = 0.36667 \quad \text{PPV} = \frac{19}{21} = 0.90476$$

p m shankar





Confusion Matrix : Threshold (optimum) = 3.939

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	7	33
	Target Present	22	8
	Total Counts	29	41

dist to top left corner of the ROC curve = 0.319

Transition Matrix: Threshold (optimum) = 3.939

$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{33}{40} & \frac{4}{15} \\ \frac{7}{40} & \frac{11}{15} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.825 & 0.2667 \\ 0.175 & 0.7333 \end{bmatrix}$$

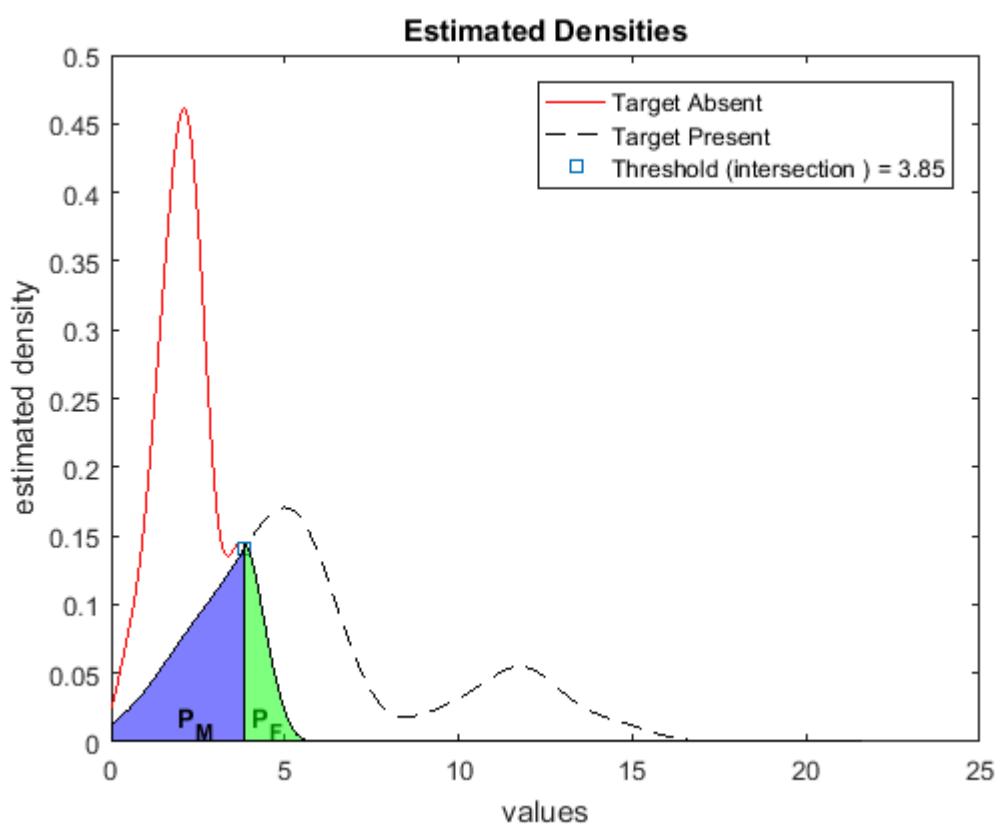
$$P_F = \frac{7}{40} = 0.175 \quad P_M = \frac{4}{15} = 0.26667 \quad \text{PPV} = \frac{22}{29} = 0.75862$$

p m shankar

data (Liu)

Target Absent					Target Present				
2.661	2.071	2.048	3.695	1.869	12.034	4.47	4.581	2.476	4.626
3.636	2.477	2.51	4.655	0.477	5.885	3.383	4.426	5.043	11.484
4.075	0.507	2.259	1.652	2.162	9.199	5.443	2.806	11.812	14.401
1.987	0.97	1.954	2.394	1.82	5.787	1.018	2.295	4.211	6.44
3.523	1.687	3.376	2.34	2.799	4.917	3.826	5.793	3.127	6.303
1.294	2.109	2.382	4.178	2.36	1.885	12.413	10.413	5.49	5.412
1.389	1.284	1.992	1.655	2.76					
4.044	1.213	2.682	1.335	1.812					

(c) P. M. Shankar



Confusion Matrix: Threshold (intersection) = 3.85

Data Collected	Target Detected	Target Not Detected	Total Counts
Target Absent	4	36	40
Target Present	22	8	30
Total Counts	26	44	70

dist to top left corner of the ROC curve = 0.285

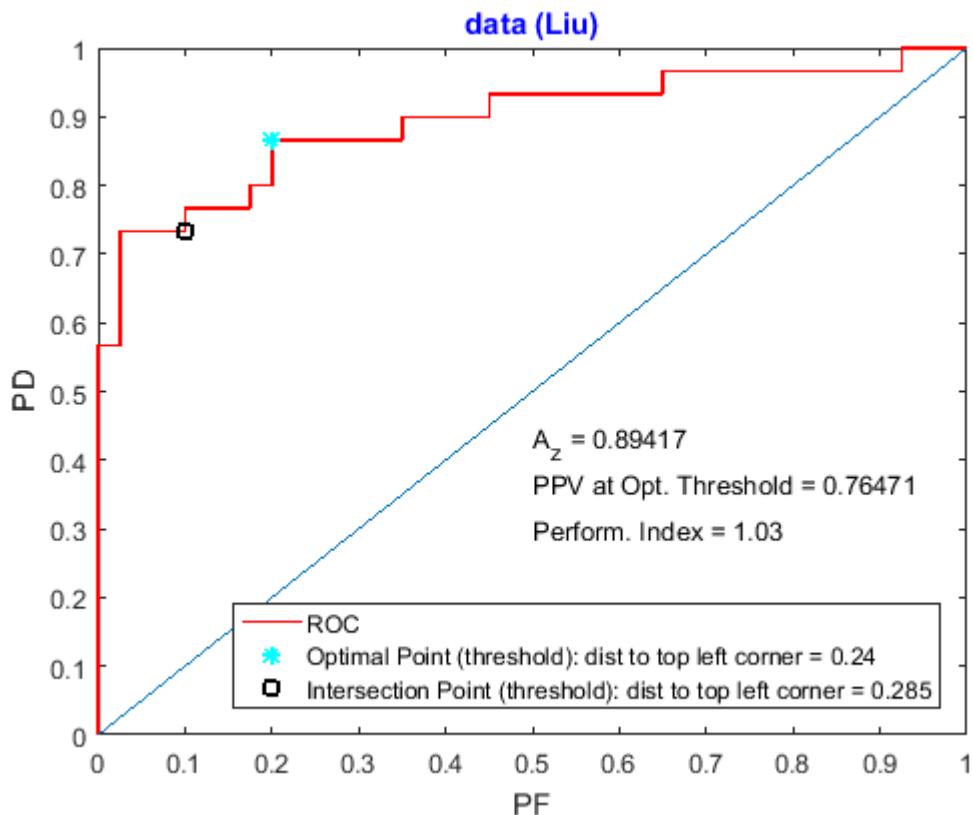
Transition Matrix: Threshold (intersection) = 3.85

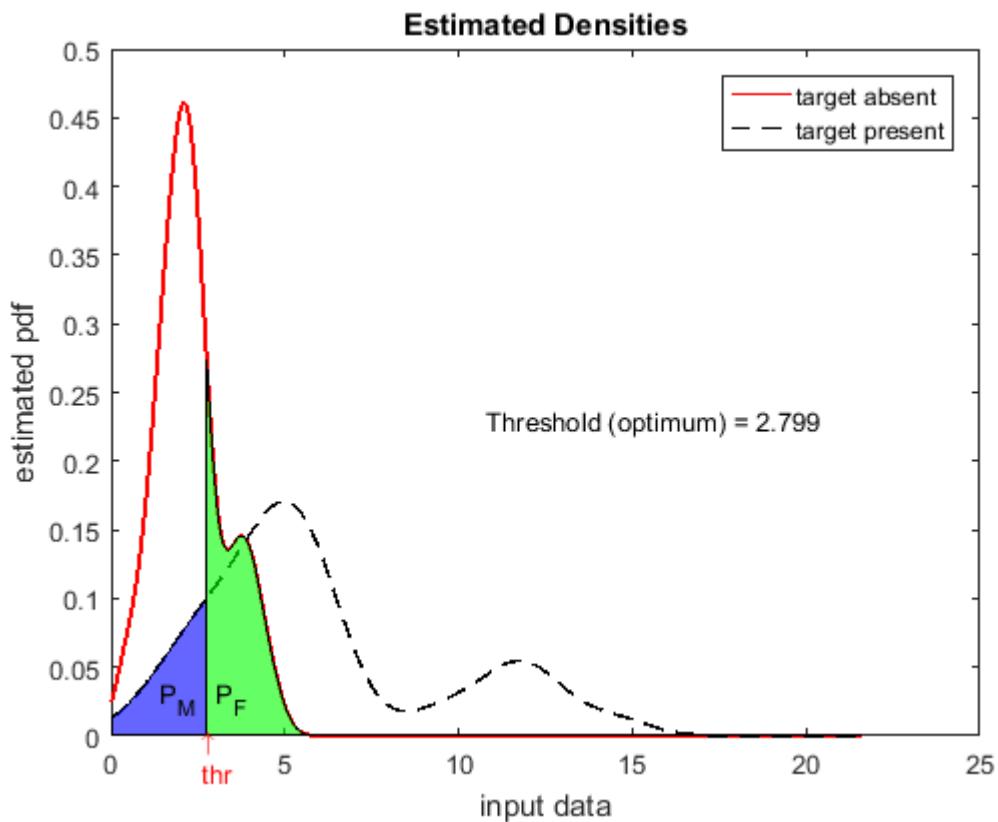
$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{9}{10} & \frac{4}{15} \\ \frac{1}{10} & \frac{11}{15} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.9 & 0.26667 \\ 0.1 & 0.7333 \end{bmatrix}$$

$$P_F = \frac{1}{10} = 0.1 \quad P_M = \frac{4}{15} = 0.26667 \quad \text{PPV} = \frac{11}{13} = 0.84615$$

p m shankar





Confusion Matrix : Threshold (optimum) = 2.799

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	8	32
	Target Present	26	4
	Total Counts	34	36

dist to top left corner of the ROC curve = 0.24

Transition Matrix: Threshold (optimum) = 2.799

$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

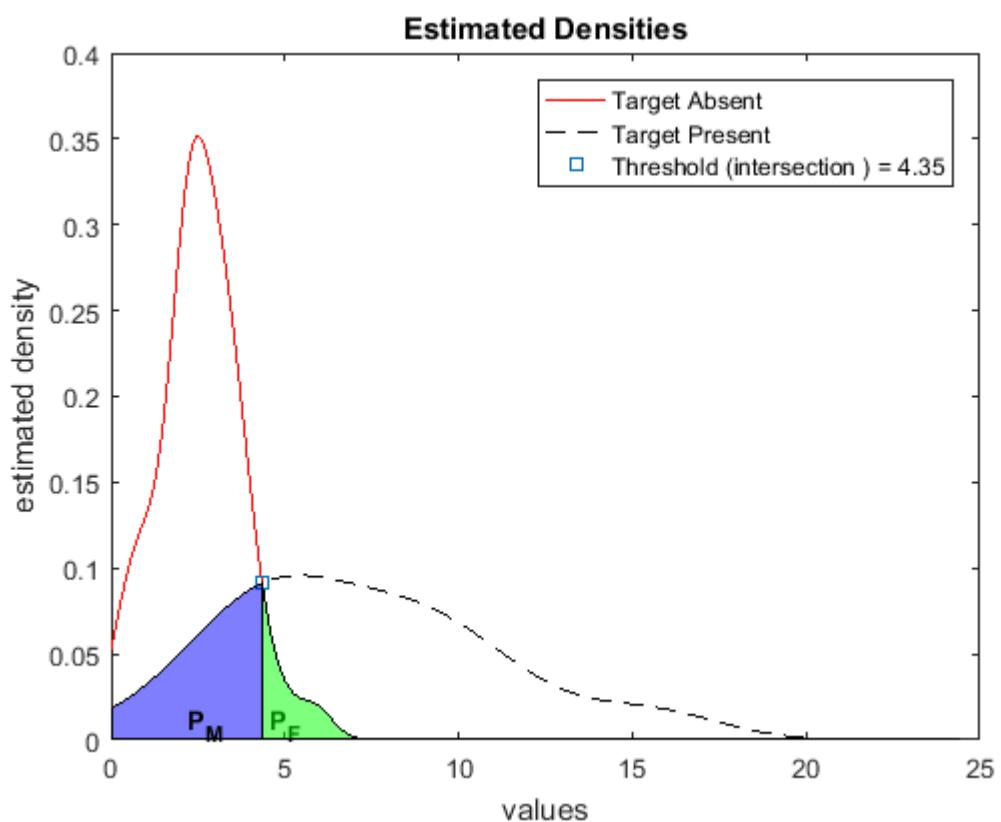
$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{4}{5} & \frac{2}{15} \\ \frac{1}{5} & \frac{13}{15} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.8 & 0.1333 \\ 0.2 & 0.8667 \end{bmatrix}$$

$$P_F = \frac{1}{5} = 0.2 \quad P_M = \frac{2}{15} = 0.1333 \quad \text{PPV} = \frac{13}{17} = 0.76471$$

p m shankar

data (Louie)									
Target Absent					Target Present				
2.997	2.888	3.699	3.058	2.346	4.93	8.877	3.296	10.33	5.595
2.324	2.259	2.276	0.234	2.77	4.563	13.555	6.31	8.479	8.601
1.563	2.441	4.204	0.982	0.392	1.986	3.124	3.274	8.36	11.072
3.302	4.766	1.587	2.01	0.684	7	3.975	6.456	8.968	7.017
2.334	3.011	0.845	5.836	3.526	15.35	11.056	16.287	5.021	11.077
2.836	2.153	3.53	2.317	2.012	0.483	5.754	9.054	3.791	4.576
2.233	2.365	2.383	0.961	3.737					
3.545	3.1	3.952	1.846	3.204					

(c) P. M. Shankar



Confusion Matrix: Threshold (intersection) = 4.35

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	2	38
	Target Present	23	7
	Total Counts	25	45

dist to top left corner of the ROC curve = 0.239

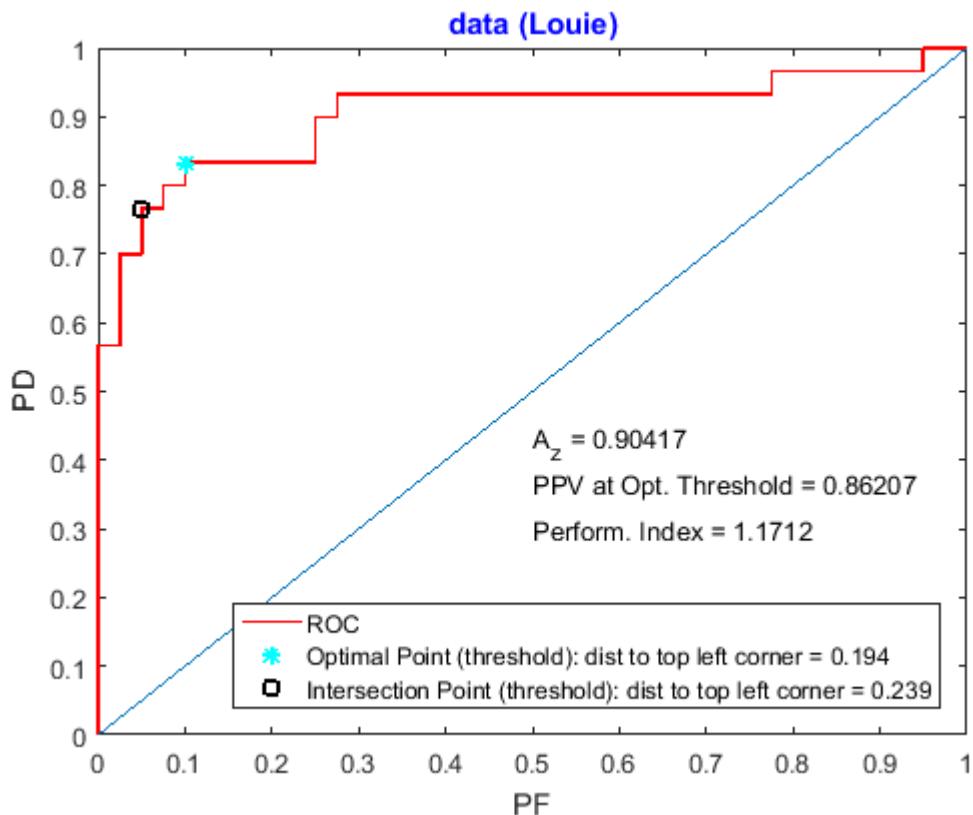
Transition Matrix: Threshold (intersection) = 4.35

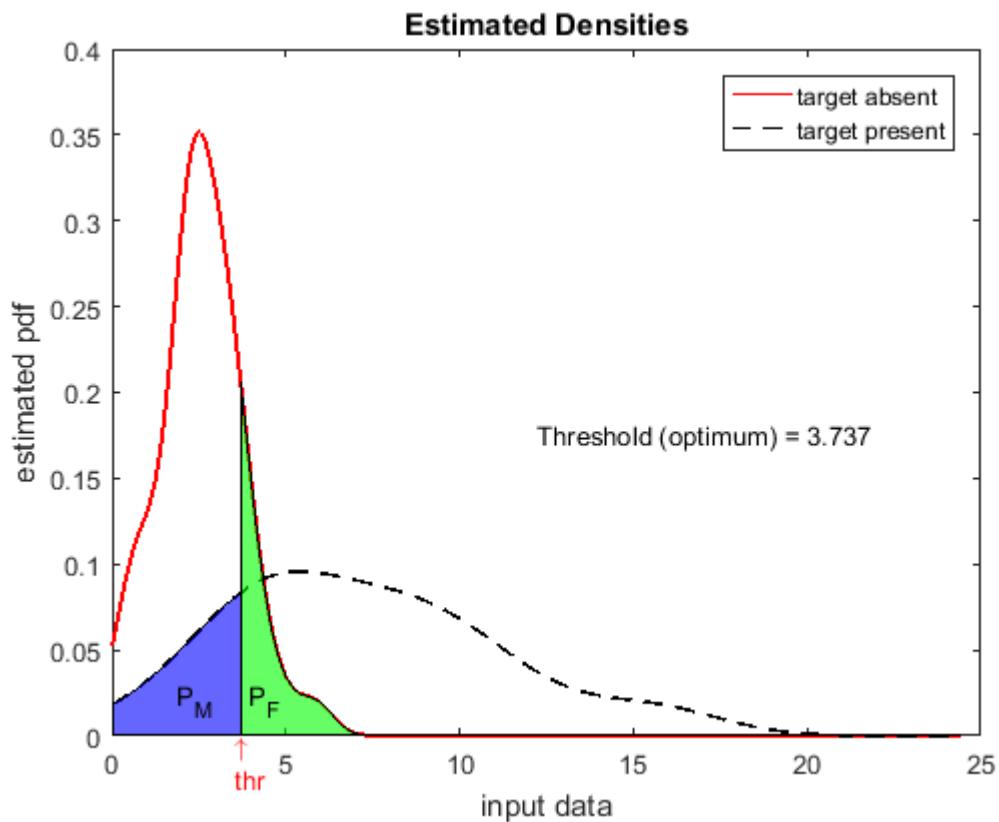
$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{19}{20} & \frac{7}{30} \\ \frac{1}{20} & \frac{23}{30} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.95 & 0.2333 \\ 0.05 & 0.7667 \end{bmatrix}$$

$$P_F = \frac{1}{20} = 0.05 \quad P_M = \frac{7}{30} = 0.2333 \quad \text{PPV} = \frac{23}{25} = 0.92$$

p m shankar





Confusion Matrix : Threshold (optimum) = 3.737

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	4	36
	Target Present	25	5
	Total Counts	29	41

dist to top left corner of the ROC curve = 0.194

Transition Matrix: Threshold (optimum) = 3.737

$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{9}{10} & \frac{1}{6} \\ \frac{1}{10} & \frac{5}{6} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.9 & 0.1667 \\ 0.1 & 0.8333 \end{bmatrix}$$

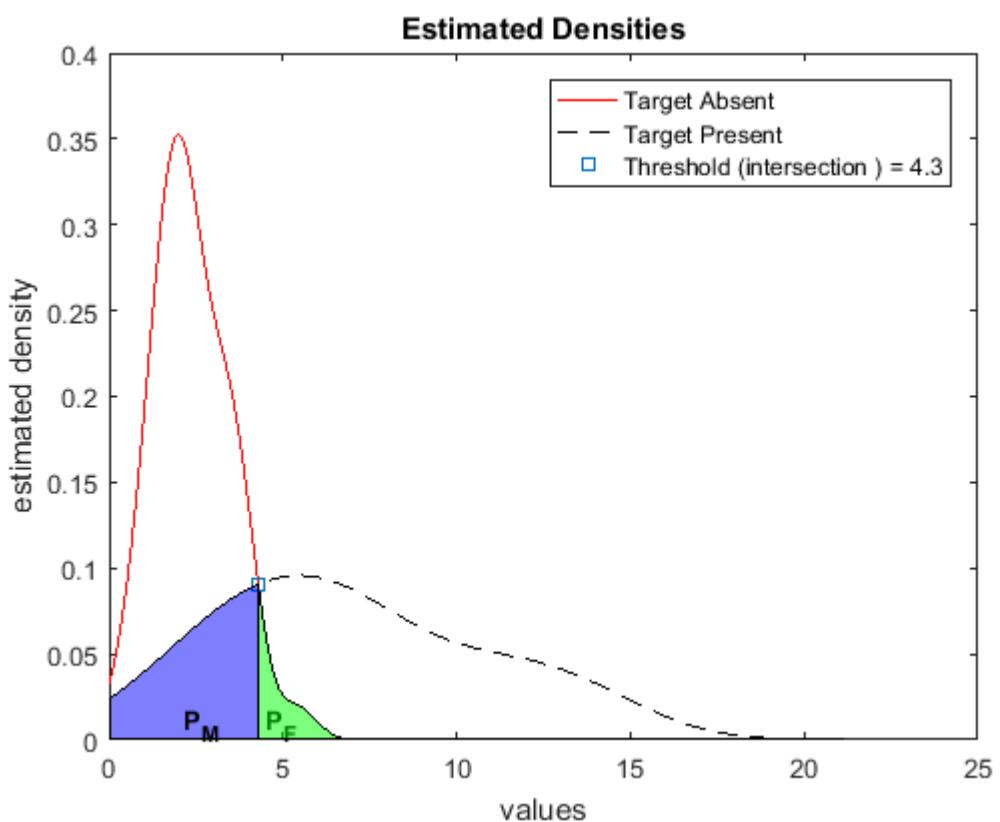
$$P_F = \frac{1}{10} = 0.1 \quad P_M = \frac{1}{6} = 0.16667 \quad \text{PPV} = \frac{25}{29} = 0.86207$$

p m shankar

data (Mahoney)

Target Absent					Target Present				
3.966	2.626	1.994	4.068	0.331	5.102	6.402	8.006	2.835	6.625
1.153	1.965	5.43	2.094	1.706	4.892	2.091	4.919	2.026	10.137
3.126	1.367	2.029	2.778	3.899	6.29	4.722	7.344	13.206	8.627
2.932	1.602	2.294	1.429	1.88	6.886	8.03	3.727	12.4	10.872
1.056	2.132	3.319	3.593	3.605	0.831	3.678	11.438	4.101	3.036
2.324	1.808	1.894	3.591	2.704	14.072	5.344	6.981	14.119	11.243
1.285	2.881	3.16	2.103	1.23					
3.596	2.185	1.502	2.293	0.717					

(c) P. M. Shankar



Confusion Matrix: Threshold (intersection) = 4.3

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	1	39
	Target Present	22	8
	Total Counts	23	47

dist to top left corner of the ROC curve = 0.268

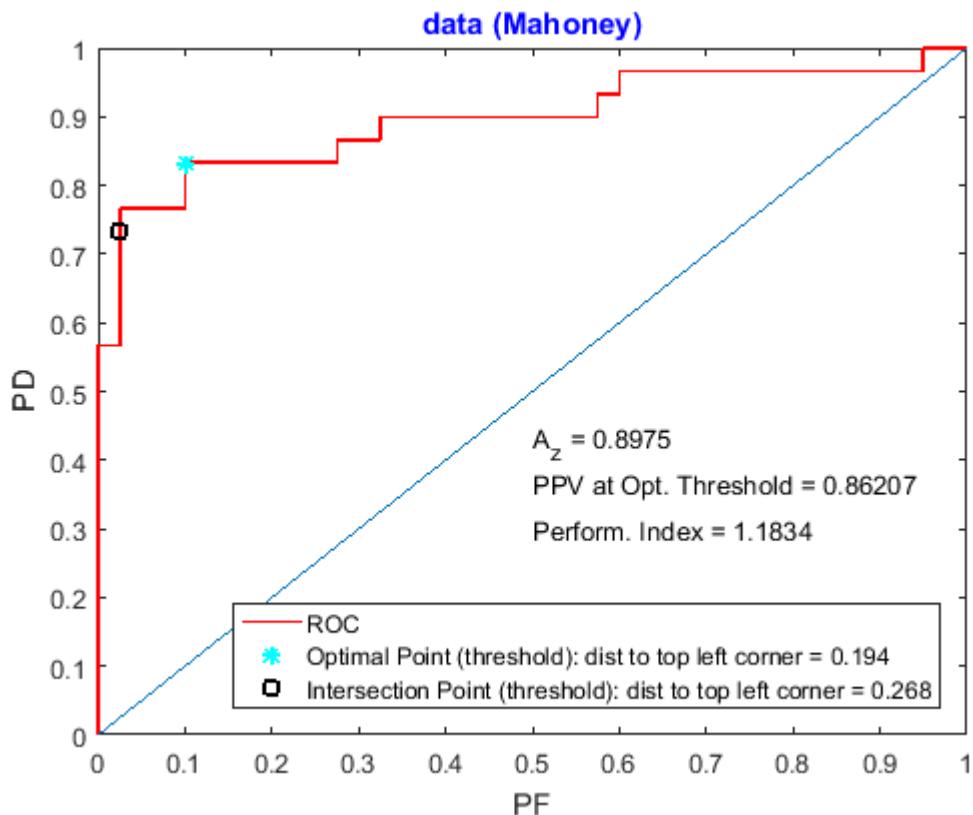
Transition Matrix: Threshold (intersection) = 4.3

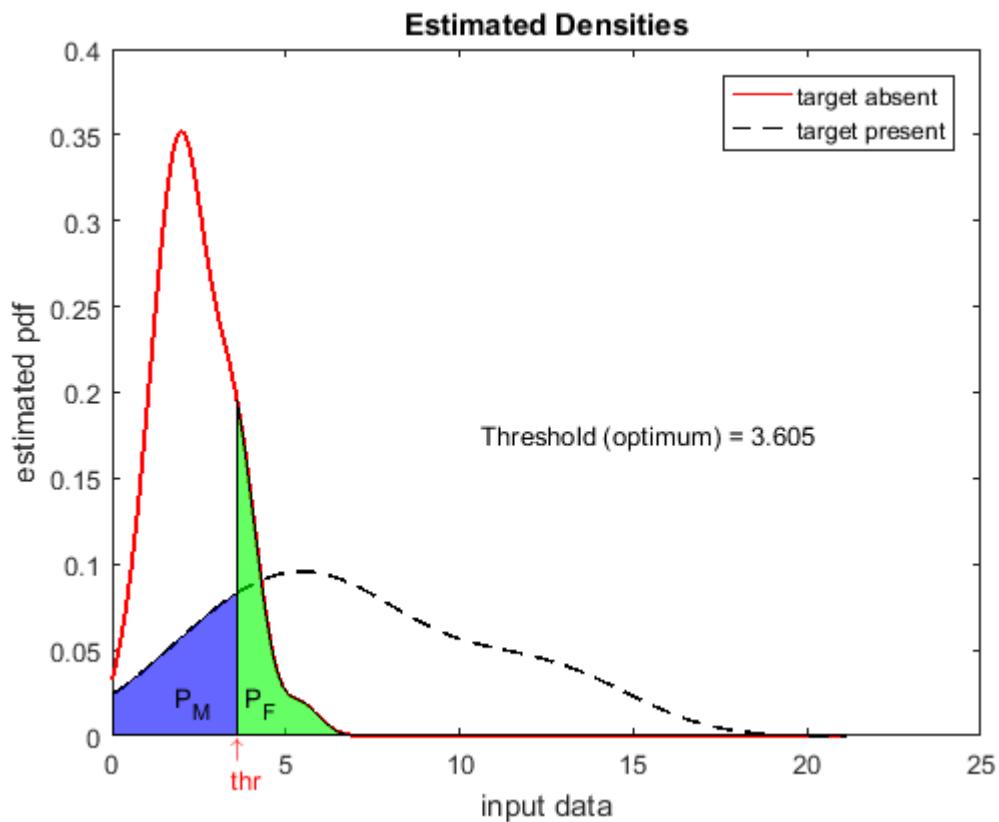
$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{39}{40} & \frac{4}{15} \\ \frac{1}{40} & \frac{11}{15} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.975 & 0.26667 \\ 0.025 & 0.7333 \end{bmatrix}$$

$$P_F = \frac{1}{40} = 0.025 \quad P_M = \frac{4}{15} = 0.26667 \quad \text{PPV} = \frac{22}{23} = 0.95652$$

p m shankar





Confusion Matrix : Threshold (optimum) = 3.605

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	4	36
	Target Present	25	5
	Total Counts	29	41

dist to top left corner of the ROC curve = 0.194

Transition Matrix: Threshold (optimum) = 3.605

$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{9}{10} & \frac{1}{6} \\ \frac{1}{10} & \frac{5}{6} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.9 & 0.1667 \\ 0.1 & 0.8333 \end{bmatrix}$$

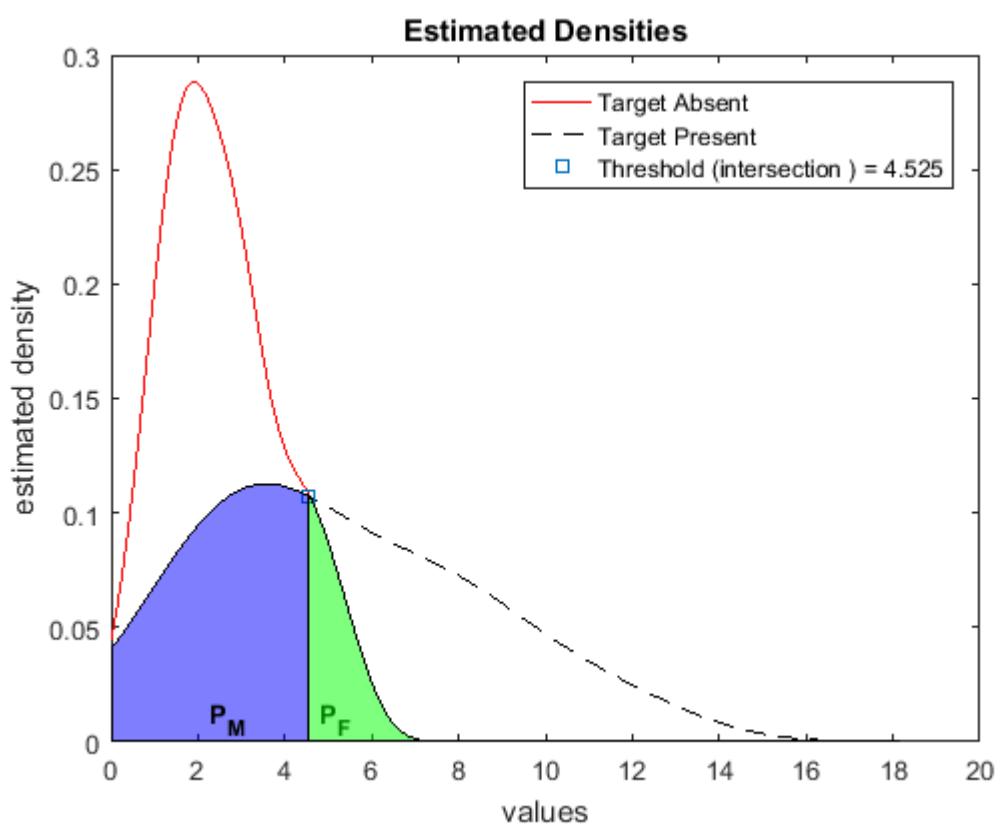
$$P_F = \frac{1}{10} = 0.1 \quad P_M = \frac{1}{6} = 0.16667 \quad \text{PPV} = \frac{25}{29} = 0.86207$$

p m shankar

data (Mak)

Target Absent					Target Present				
1.686	1.343	1.668	1.797	4.317	3.506	7.072	11.386	6.483	1.661
2.78	2.452	1.276	2.62	1.532	3.629	8.499	7.094	1.276	1.743
3.596	3.042	5.434	4.362	2.652	7.561	3.307	3.692	8.041	2.924
3.26	0.387	3.703	1.833	0.982	1.424	2.56	4.694	1.56	4.671
4.658	4.481	2.975	5.421	1.771	12.121	4.538	3.172	4.238	5.15
1.426	0.91	1.861	2.193	0.67	8.95	10.406	2.903	6.79	8.419
3.009	1.162	2.151	4.68	3.19					
2.618	1.322	3.003	1.872	2.194					

(c) P. M. Shankar



Confusion Matrix: Threshold (intersection) = 4.525

Data Collected	Target Detected	Target Not Detected	Total Counts
Target Absent	4	36	40
Target Present	16	14	30
Total Counts	20	50	70

Errors circled

dist to top left corner of the ROC curve = 0.477

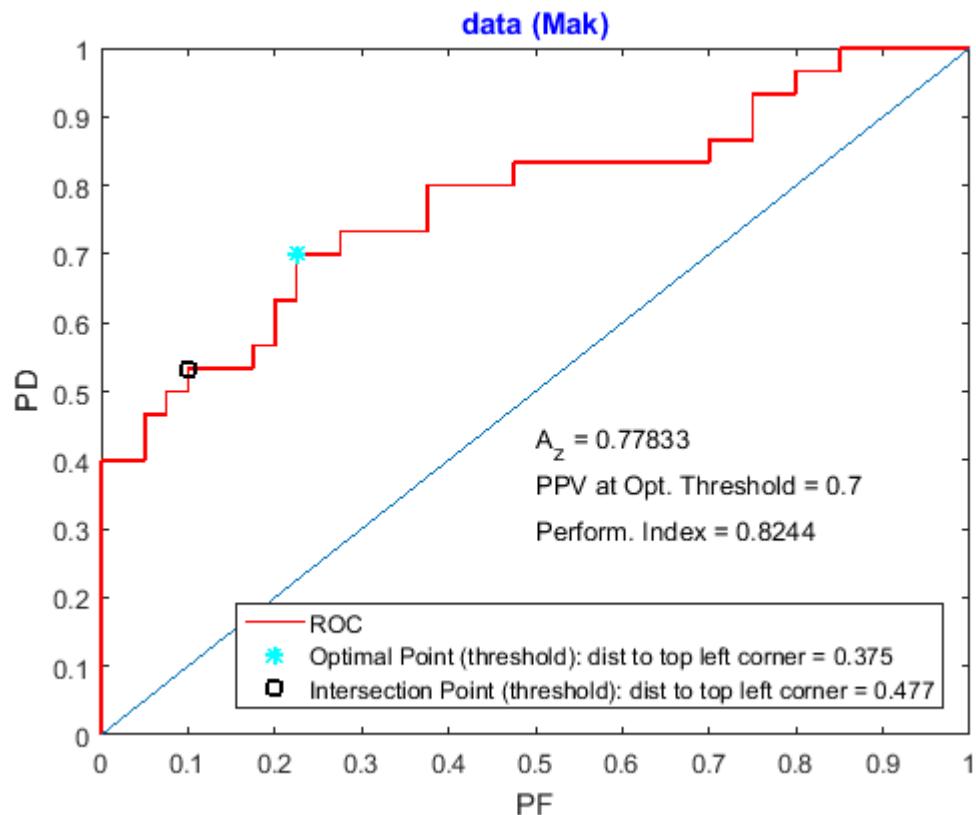
Transition Matrix: Threshold (intersection) = 4.525

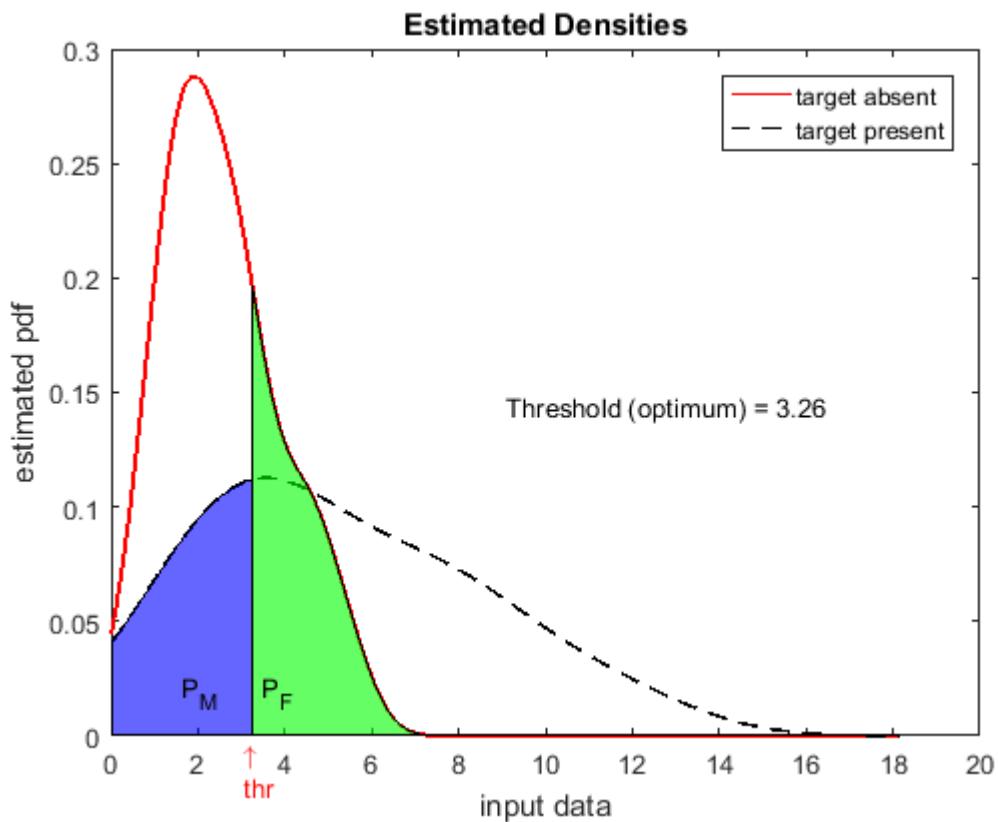
$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{9}{10} & \frac{7}{15} \\ \frac{1}{10} & \frac{8}{15} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.9 & 0.46667 \\ 0.1 & 0.5333 \end{bmatrix}$$

$$P_F = \frac{1}{10} = 0.1 \quad P_M = \frac{7}{15} = 0.46667 \quad \text{PPV} = \frac{4}{5} = 0.8$$

p m shankar





Confusion Matrix : Threshold (optimum) = 3.26

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	9	31
	Target Present	21	9
	Total Counts	30	40

dist to top left corner of the ROC curve = 0.375

Transition Matrix: Threshold (optimum) = 3.26

$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{31}{40} & \frac{3}{10} \\ \frac{9}{40} & \frac{7}{10} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.775 & 0.3 \\ 0.225 & 0.7 \end{bmatrix}$$

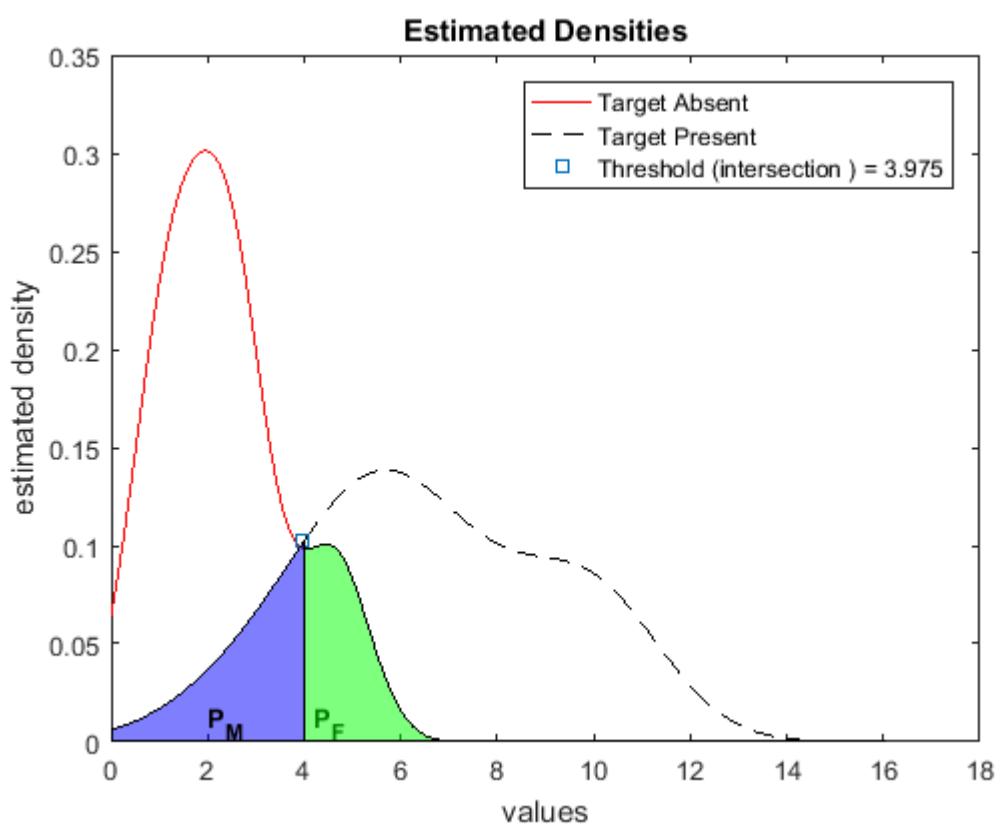
$$P_F = \frac{9}{40} = 0.225 \quad P_M = \frac{3}{10} = 0.3 \quad \text{PPV} = \frac{7}{10} = 0.7$$

p m shankar

data (Miksitz)

Target Absent					Target Present				
2.15	2.29	1.691	1.412	1.588	5.727	4.5	5.079	7.879	6.428
3.197	2.619	1.585	0.855	4.133	6.947	7.527	4.009	8.454	7.22
2.83	1.012	4.779	2.789	3.543	4.331	5.105	3.414	10.179	5.662
4.783	2.157	1.25	0.963	1.671	9.057	6.162	10.275	9.793	9.678
2.899	3.889	5.438	1.349	2.502	5.939	5.884	5.473	5.963	10.022
2.852	1.947	4.729	4.534	0.886	4.262	2.843	10.719	10.053	1.876
0.353	1.709	2.277	0.783	2.601					
0.276	2.481	0.924	2.221	1.718					

(c) P. M. Shankar



Confusion Matrix: Threshold (intersection) = 3.975

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	6	34
	Target Present	27	3
	Total Counts	33	37

dist to top left corner of the ROC curve = 0.18

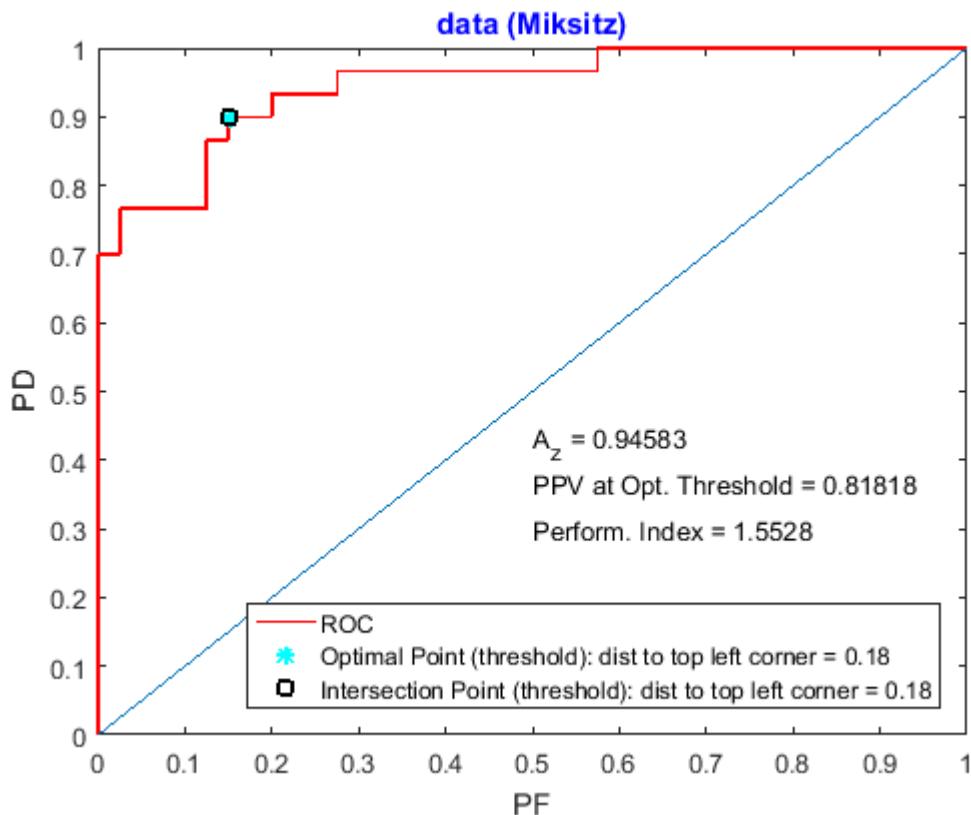
Transition Matrix: Threshold (intersection) = 3.975

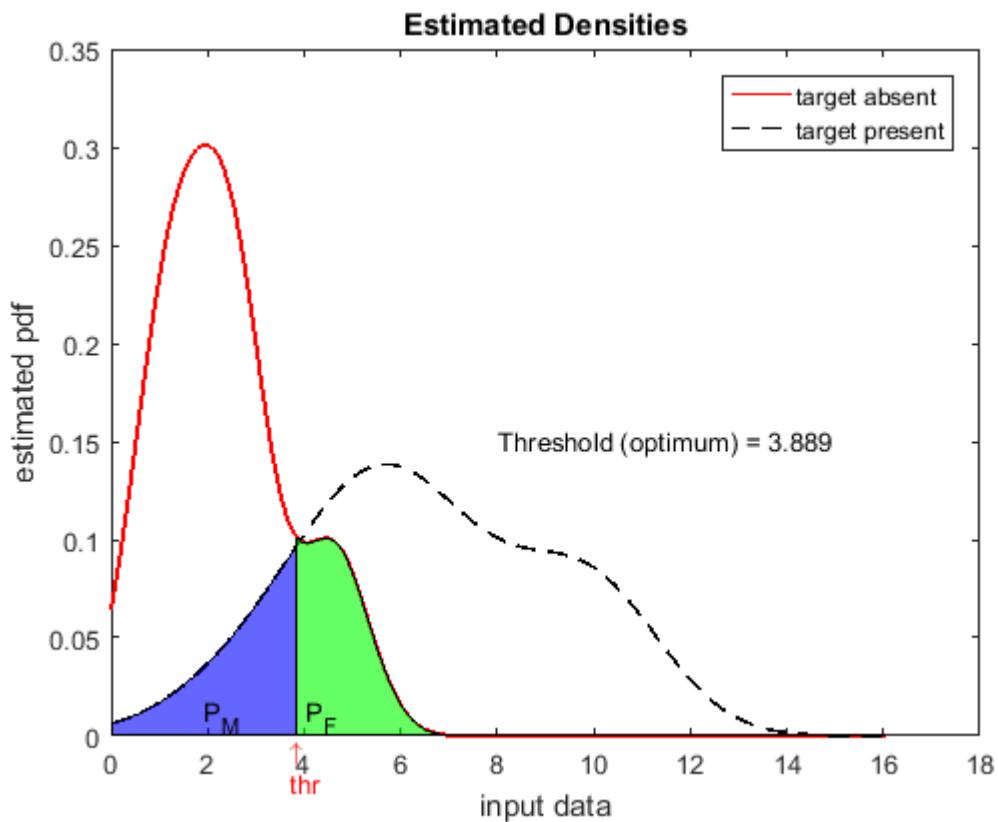
$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{17}{20} & \frac{1}{10} \\ \frac{3}{20} & \frac{9}{10} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.85 & 0.1 \\ 0.15 & 0.9 \end{bmatrix}$$

$$P_F = \frac{3}{20} = 0.15 \quad P_M = \frac{1}{10} = 0.1 \quad \text{PPV} = \frac{9}{11} = 0.81818$$

p m shankar





Confusion Matrix : Threshold (optimum) = 3.889

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	6	34
	Target Present	27	3
	Total Counts	33	37

dist to top left corner of the ROC curve = 0.18

Transition Matrix: Threshold (optimum) = 3.889

$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{17}{20} & \frac{1}{10} \\ \frac{3}{20} & \frac{9}{10} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.85 & 0.1 \\ 0.15 & 0.9 \end{bmatrix}$$

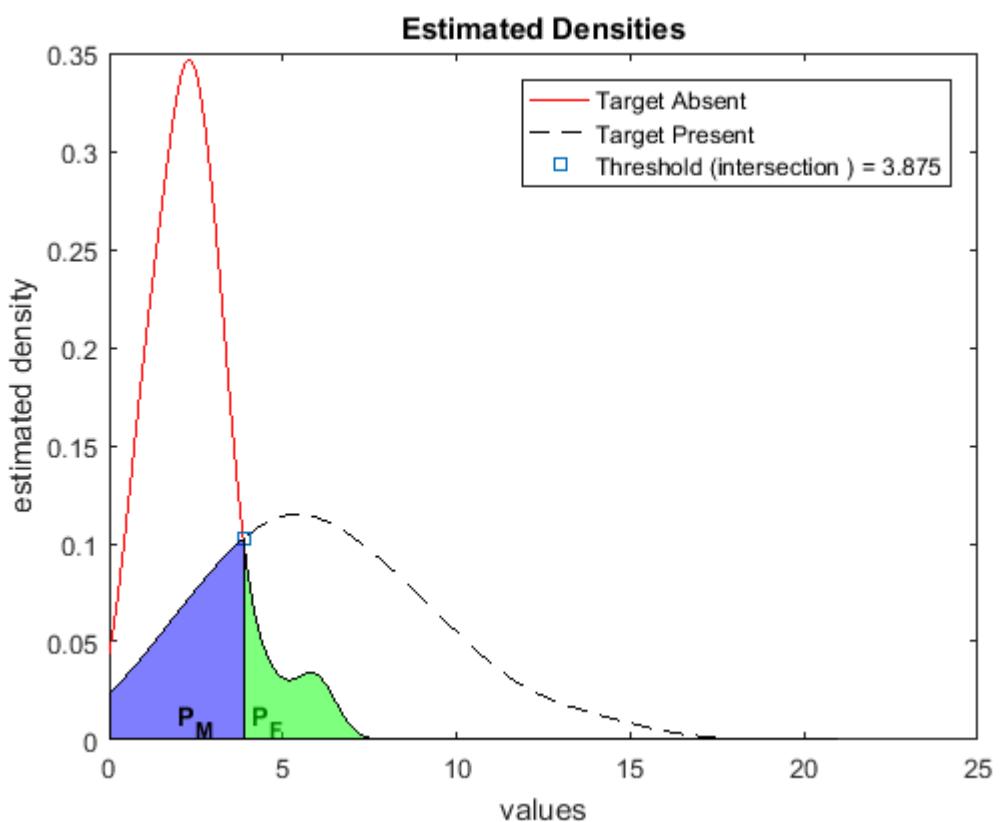
$$P_F = \frac{3}{20} = 0.15 \quad P_M = \frac{1}{10} = 0.1 \quad \text{PPV} = \frac{9}{11} = 0.81818$$

p m shankar

data (Millington)

Target Absent					Target Present				
1.037	2.135	3.215	2.14	1.995	6.496	2.178	2.694	2.57	5.023
1.35	2.071	6.118	1.392	1.173	4.981	6.906	8.241	3.647	9.738
3.353	2.291	2.788	2.5	5.671	7.254	6.98	5.667	6.206	8.982
4.134	0.722	4.595	3.024	2.287	4.47	2.329	8.23	5.054	10.306
0.36	3.044	1.967	3.436	1.459	0.95	8.068	4.398	13.982	2.336
2.276	1.201	2.009	2.322	2.989	11.979	5.136	4.92	5.199	9.369
1.077	2.299	0.731	2.235	2.014					
2.897	2.796	2.782	1.414	3.299					

(c) P. M. Shankar



Confusion Matrix: Threshold (intersection) = 3.875

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	4	36
	Target Present	23	7
	Total Counts	27	43

dist to top left corner of the ROC curve = 0.254

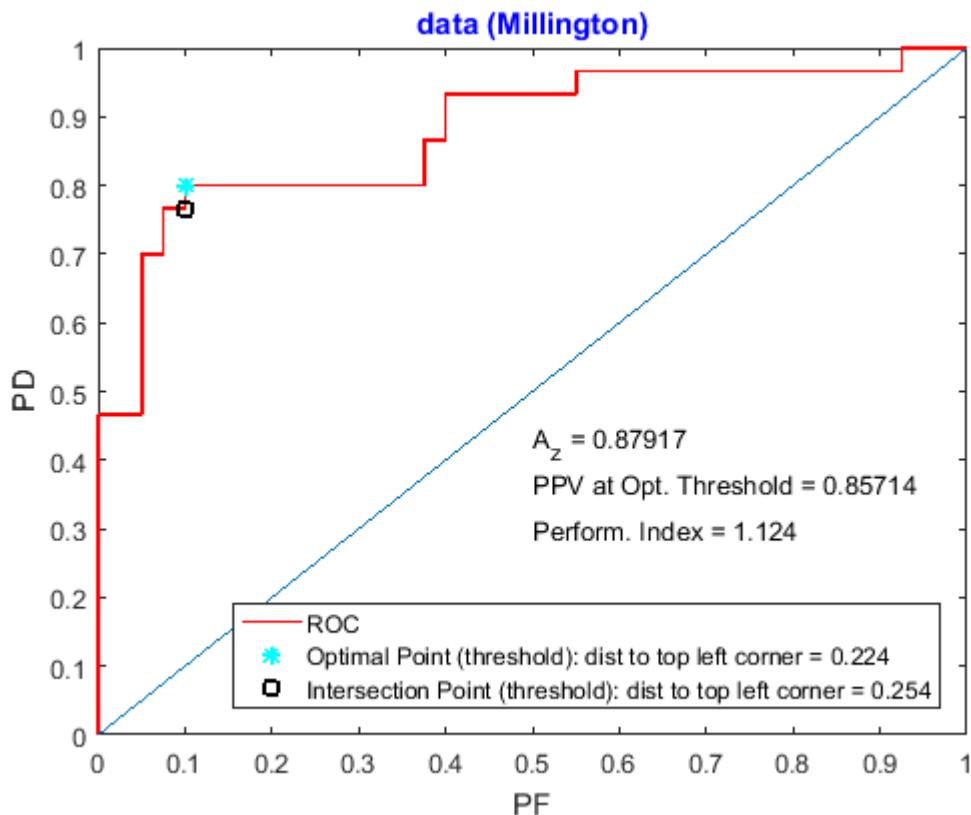
Transition Matrix: Threshold (intersection) = 3.875

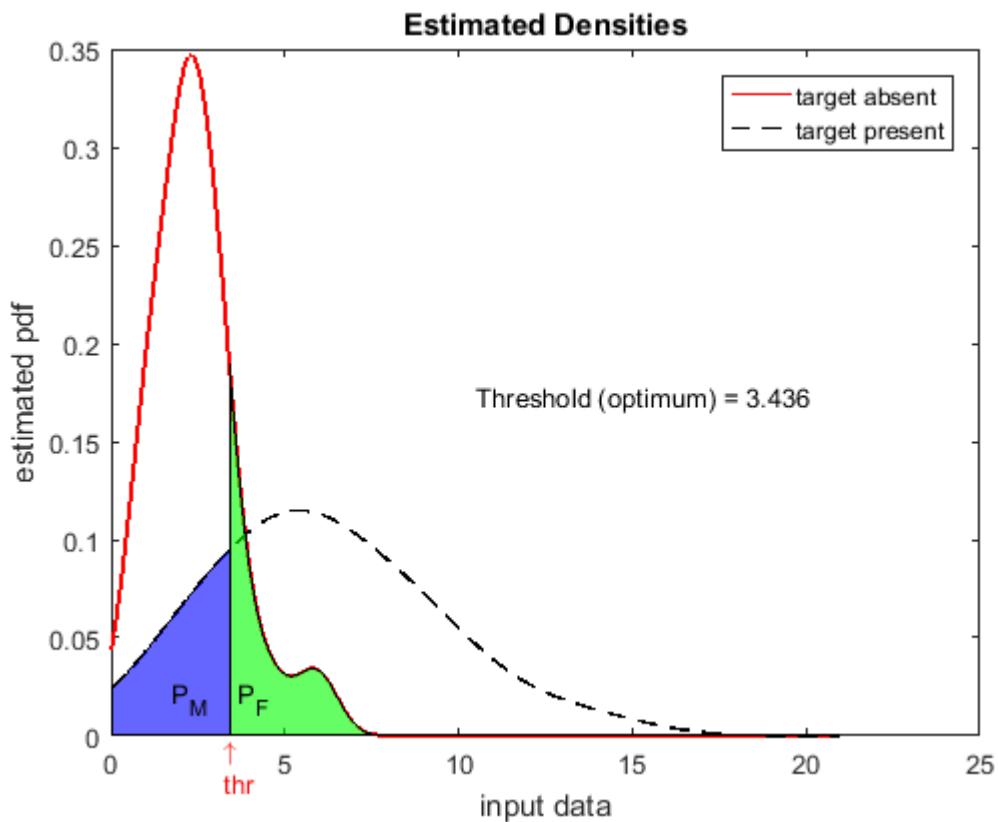
$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{9}{10} & \frac{7}{30} \\ \frac{1}{10} & \frac{23}{30} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.9 & 0.2333 \\ 0.1 & 0.7667 \end{bmatrix}$$

$$P_F = \frac{1}{10} = 0.1 \quad P_M = \frac{7}{30} = 0.2333 \quad \text{PPV} = \frac{23}{27} = 0.85185$$

p m shankar





Confusion Matrix : Threshold (optimum) = 3.436

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	4	36
	Target Present	24	6
	Total Counts	28	42

dist to top left corner of the ROC curve = 0.224

Transition Matrix: Threshold (optimum) = 3.436

$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{9}{10} & \frac{1}{5} \\ \frac{1}{10} & \frac{4}{5} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.9 & 0.2 \\ 0.1 & 0.8 \end{bmatrix}$$

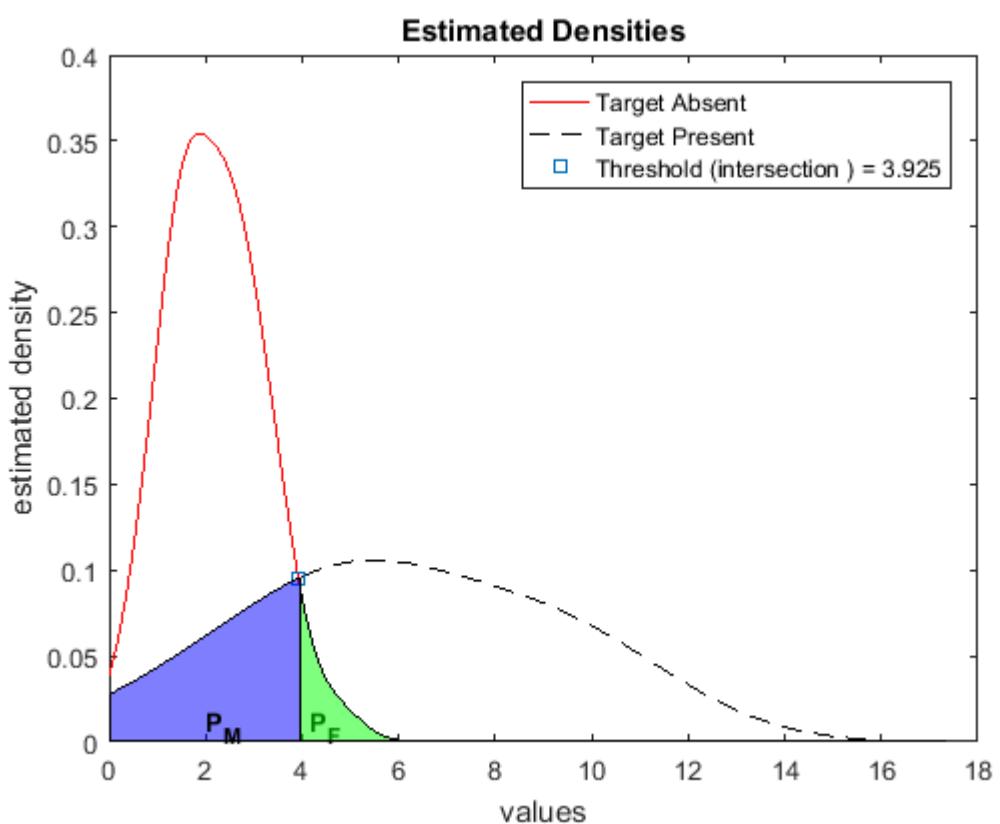
$$P_F = \frac{1}{10} = 0.1 \quad P_M = \frac{1}{5} = 0.2 \quad \text{PPV} = \frac{6}{7} = 0.85714$$

p m shankar

data (Morris)

Target Absent					Target Present				
1.398	2.9	1.417	2.427	2.336	9.226	3.941	4.167	10.051	3.339
2.618	1.886	0.64	2.633	2.338	5.287	6.28	3.528	6.519	6.038
1.318	1.262	1.208	2.506	3.248	5.656	4.662	8.999	8.786	11.272
2.2	2.201	2.666	0.492	1.452	9.918	5.154	8.521	9.39	1.519
1.645	1.775	3.589	2.679	4.708	2.379	0.256	4.934	6.001	8.036
3.221	3.432	1.567	1.546	2.671	3.272	5.726	7.597	1.454	11.581
2.624	0.639	3.746	3.354	3.084					
1.458	1.797	1.277	1.472	1.957					

(c) P. M. Shankar



Confusion Matrix: Threshold (intersection) = 3.925

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	1	39
	Target Present	23	7
	Total Counts	24	46

dist to top left corner of the ROC curve = 0.235

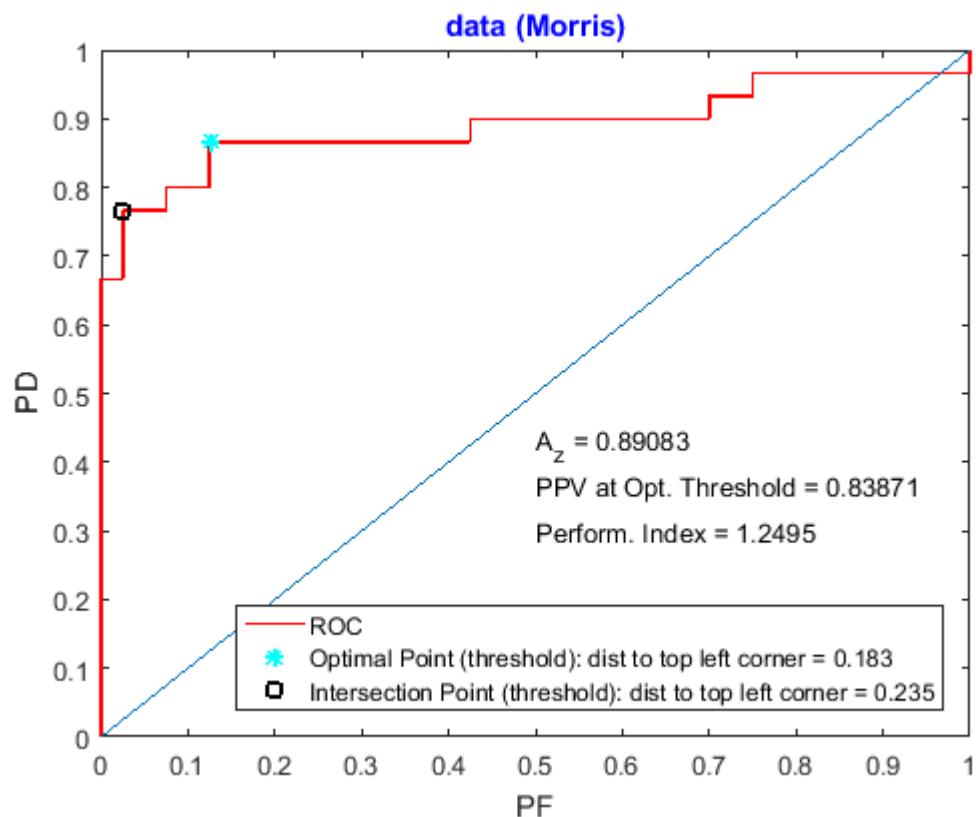
Transition Matrix: Threshold (intersection) = 3.925

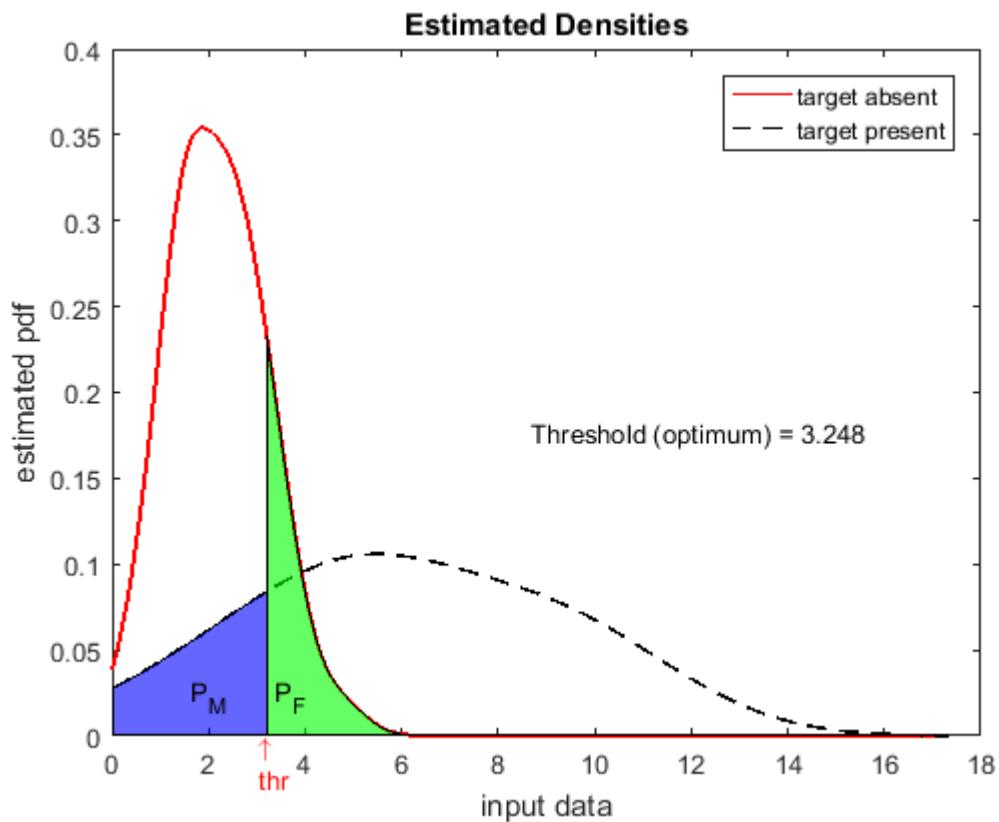
$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{39}{40} & \frac{7}{30} \\ \frac{1}{40} & \frac{23}{30} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.975 & 0.2333 \\ 0.025 & 0.7667 \end{bmatrix}$$

$$P_F = \frac{1}{40} = 0.025 \quad P_M = \frac{7}{30} = 0.23333 \quad \text{PPV} = \frac{23}{24} = 0.95833$$

p m shankar





Confusion Matrix : Threshold (optimum) = 3.248

Data Collected		Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	5	35	40
	Target Present	26	4	30
	Total Counts	31	39	70

dist to top left corner of the ROC curve = 0.183

Transition Matrix: Threshold (optimum) = 3.248

$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{7}{8} & \frac{2}{15} \\ \frac{1}{8} & \frac{13}{15} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.875 & 0.1333 \\ 0.125 & 0.8667 \end{bmatrix}$$

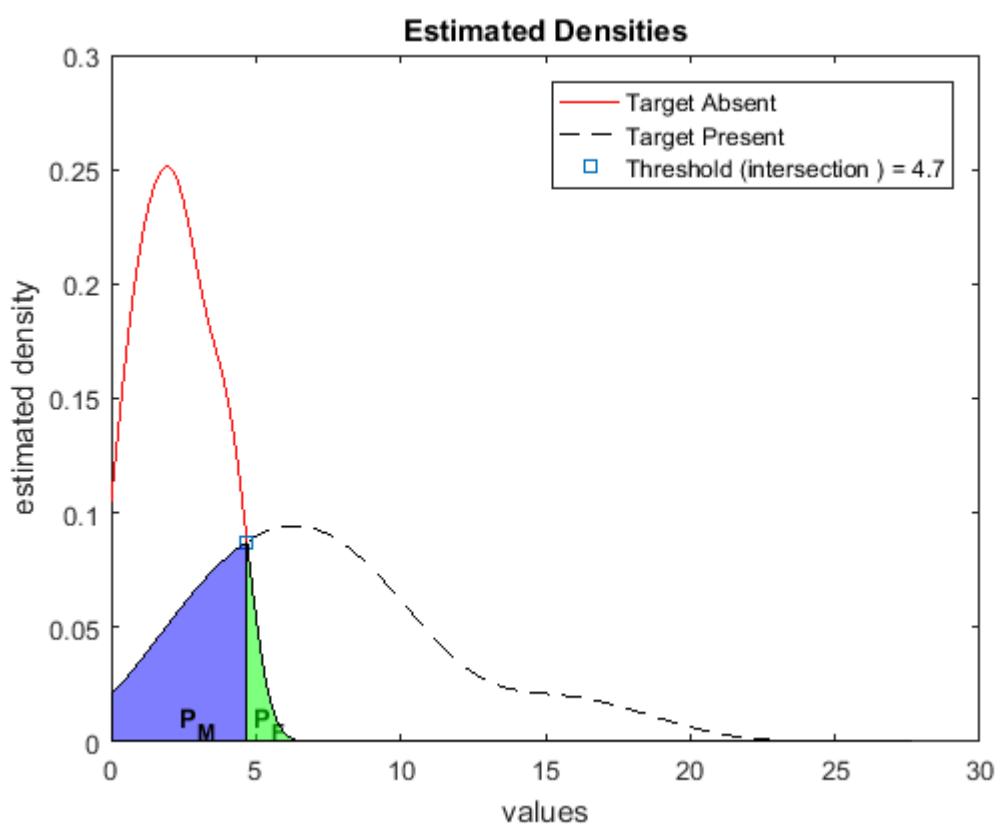
$$P_F = \frac{1}{8} = 0.125 \quad P_M = \frac{2}{15} = 0.1333 \quad \text{PPV} = \frac{26}{31} = 0.83871$$

p m shankar

data (Muhammad)

Target Absent					Target Present				
4.102	2.582	1.401	2.701	0.43	3.688	15.789	3.066	7.155	6.388
0.536	1.61	4.231	0.905	3.933	3.028	6.13	5.859	8.437	9.459
2.468	3.14	1.365	2.506	2.661	4.95	4.477	3.494	6.863	15.615
1.243	3.957	1.315	4.251	2.28	18.441	5.858	9.14	5.795	10.815
1.362	4.283	2.074	0.369	1.063	8.937	1.775	1.915	10.239	10.306
3.499	1.961	0.292	0.242	1.633	8.259	7.367	13.569	6.317	2.694
4.408	1.984	1.016	2.43	1.944					
3.086	3.724	2.39	3.101	0.309					

(c) P. M. Shankar



Confusion Matrix: Threshold (intersection) = 4.7

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	0	40
	Target Present	22	8
	Total Counts	22	48

dist to top left corner of the ROC curve = 0.267

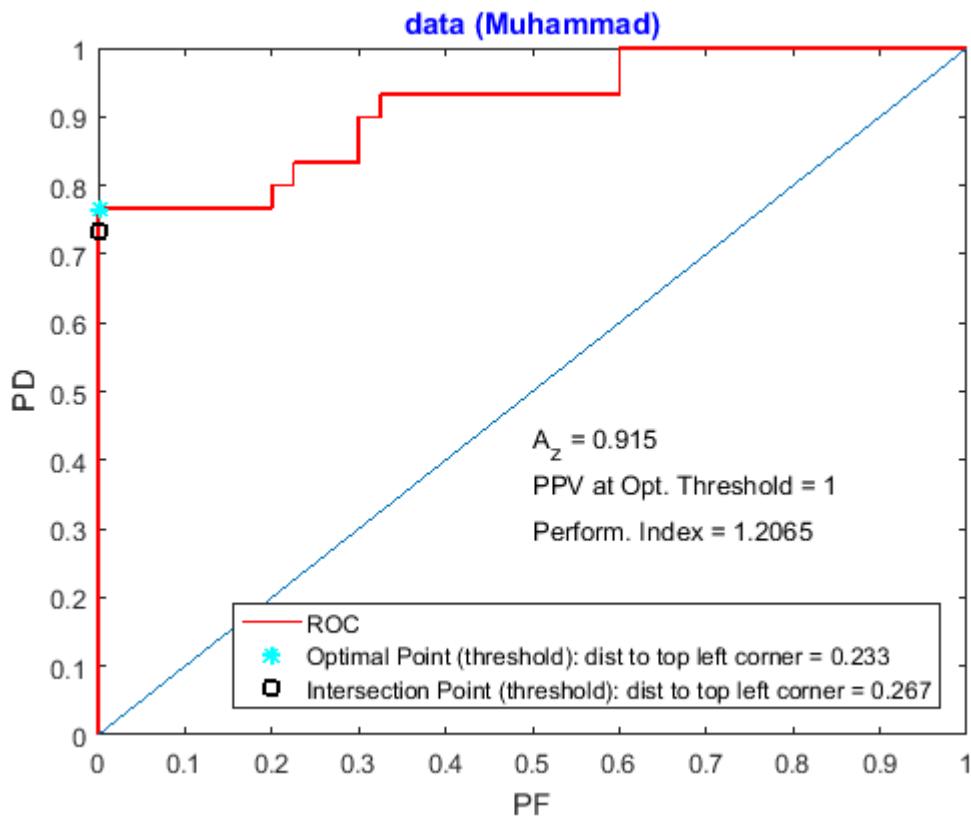
Transition Matrix: Threshold (intersection) = 4.7

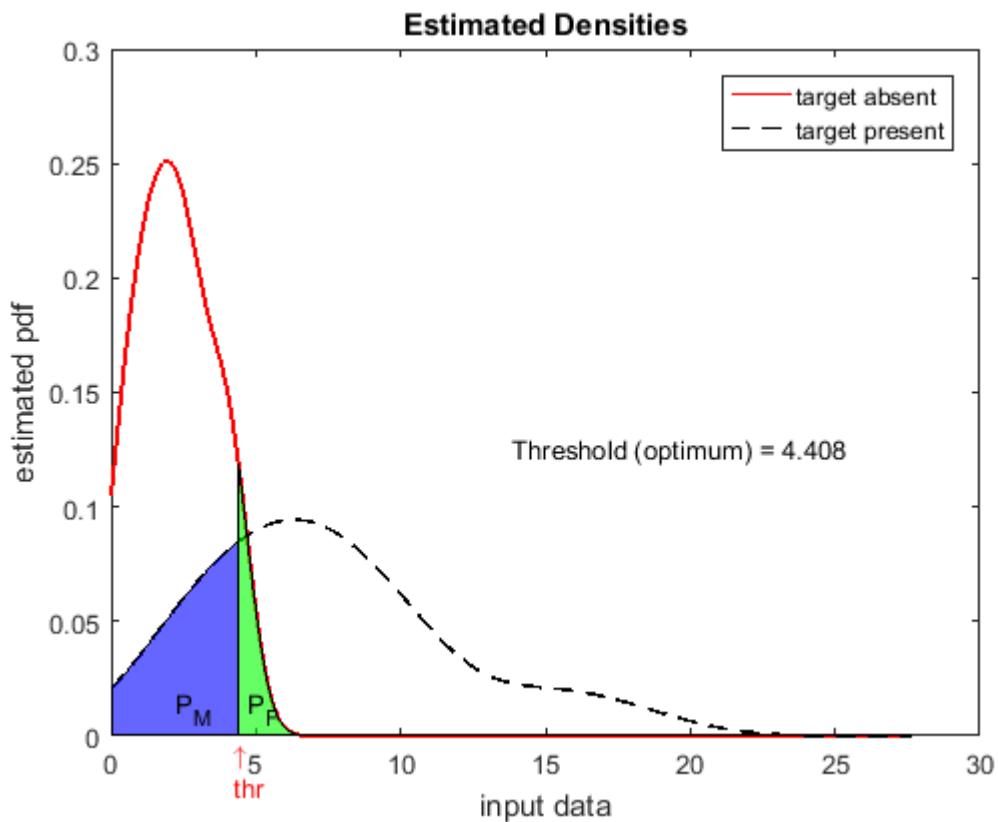
$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} 1 & \frac{4}{15} \\ 0 & \frac{11}{15} \end{bmatrix} \Rightarrow \begin{bmatrix} 1 & 0.26667 \\ 0 & 0.7333 \end{bmatrix}$$

$$P_F = 0 = 0 \quad P_M = \frac{4}{15} = 0.26667 \quad \text{PPV} = 1 = 1$$

p m shankar





Confusion Matrix : Threshold (optimum) = 4.408

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	0	40
	Target Present	23	7
	Total Counts	23	47

dist to top left corner of the ROC curve = 0.233

Transition Matrix: Threshold (optimum) = 4.408

$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} 1 & \frac{7}{30} \\ 0 & \frac{23}{30} \end{bmatrix} \Rightarrow \begin{bmatrix} 1 & 0.2333 \\ 0 & 0.7667 \end{bmatrix}$$

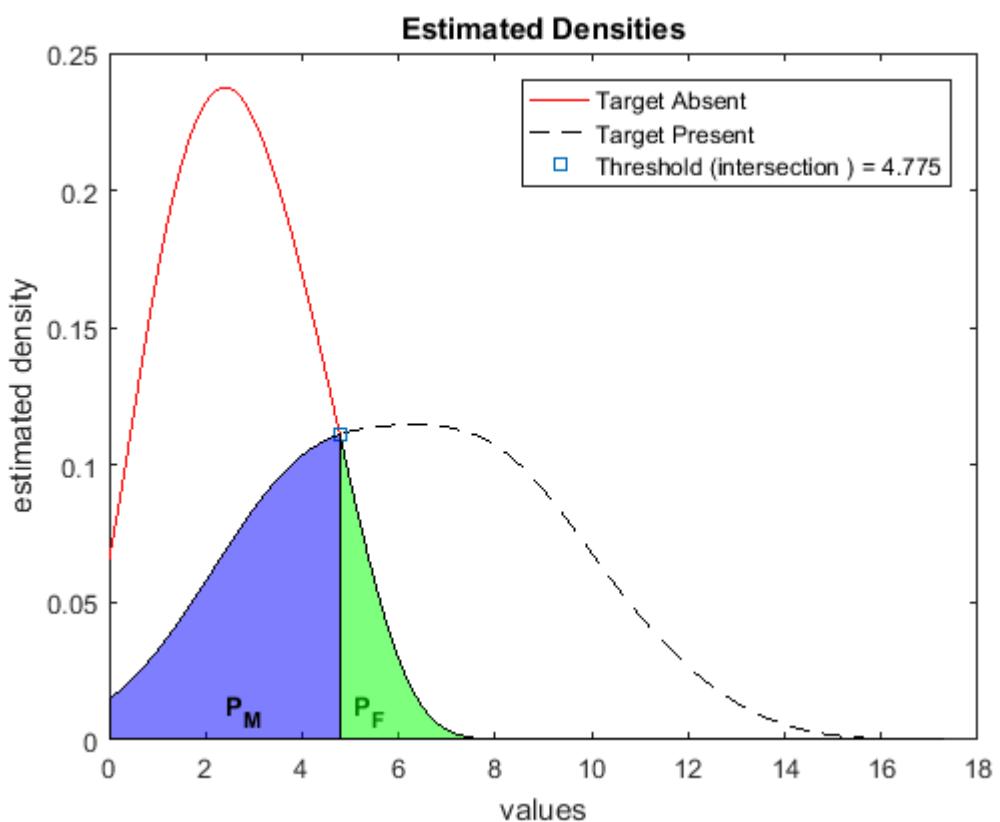
$$P_F = 0 = 0 \quad P_M = \frac{7}{30} = 0.23333 \quad \text{PPV} = 1 = 1$$

p m shankar

data (Neal)

Target Absent					Target Present				
1.011	1.322	0.961	3.327	1.418	3.756	7.013	6.935	8.485	4.778
1.044	3.297	1.814	1.767	2.634	4.326	9.181	6	11.551	3.357
4.148	3.751	5.028	2.013	2.311	2.669	9.87	4.412	3.53	2.42
3.686	4.422	2.575	4.977	3.179	11.167	9.256	6.477	8.288	5.976
4.371	2.386	2.116	0.569	2.155	8.506	7.409	4.201	8.447	4.75
3.829	2.375	1.373	1.809	5.349	3.94	7.746	1.517	5.751	7.634
3.053	3.192	0.799	2.579	4.385					
0.619	0.987	2.915	2.73	3.871					

(c) P. M. Shankar



Confusion Matrix: Threshold (intersection) = 4.775

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	3	37
	Target Present	19	11
	Total Counts	22	48

dist to top left corner of the ROC curve = 0.374

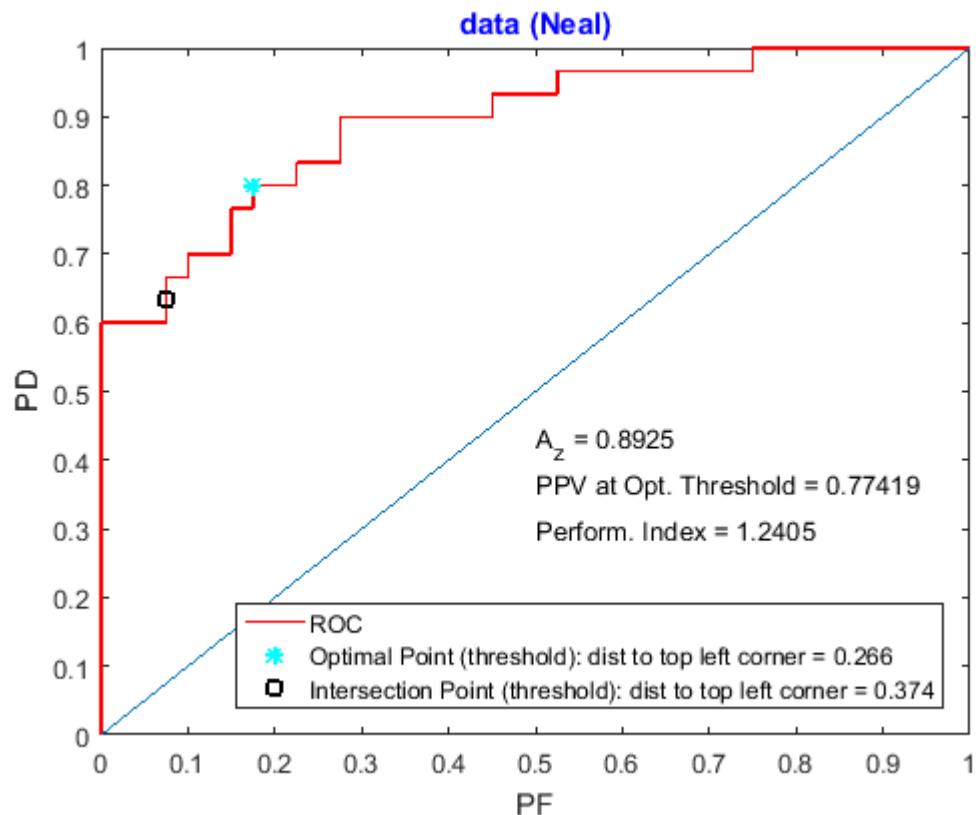
Transition Matrix: Threshold (intersection) = 4.775

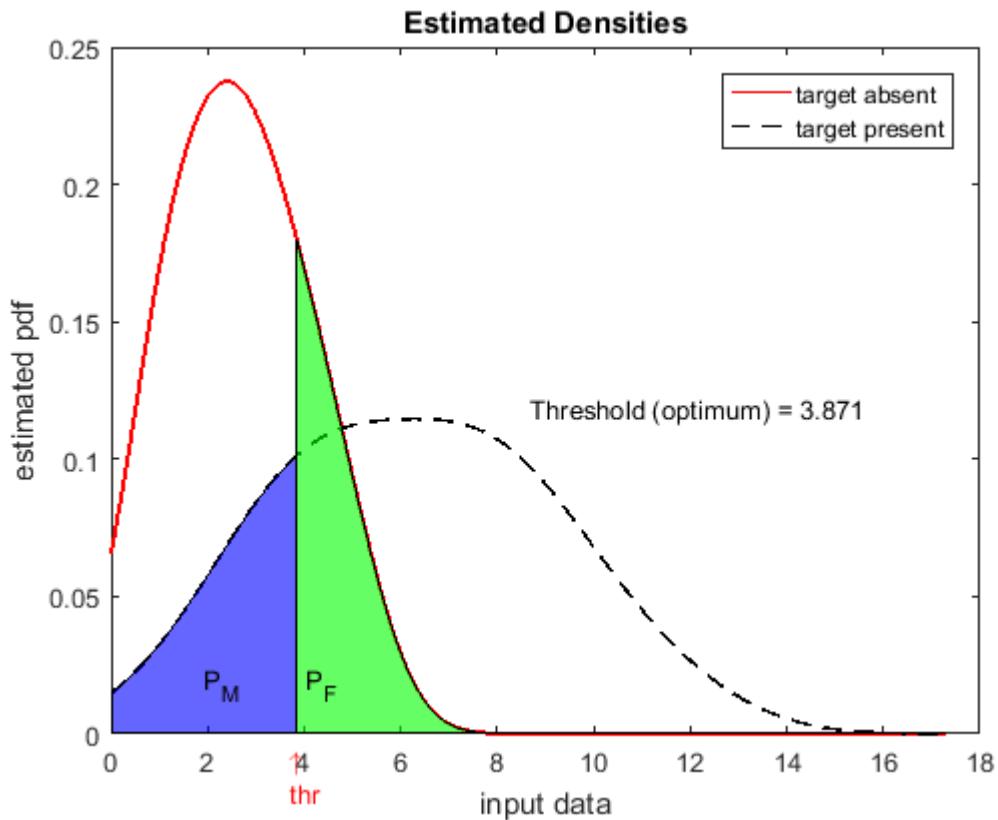
$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{37}{40} & \frac{11}{30} \\ \frac{3}{40} & \frac{19}{30} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.925 & 0.36667 \\ 0.075 & 0.6333 \end{bmatrix}$$

$$P_F = \frac{3}{40} = 0.075 \quad P_M = \frac{11}{30} = 0.36667 \quad \text{PPV} = \frac{19}{22} = 0.86364$$

p m shankar





Confusion Matrix : Threshold (optimum) = 3.871

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent 7	33	40
	24	6	30
	31	39	70

dist to top left corner of the ROC curve = 0.266

Transition Matrix: Threshold (optimum) = 3.871

$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{33}{40} & \frac{1}{5} \\ \frac{7}{40} & \frac{4}{5} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.825 & 0.2 \\ 0.175 & 0.8 \end{bmatrix}$$

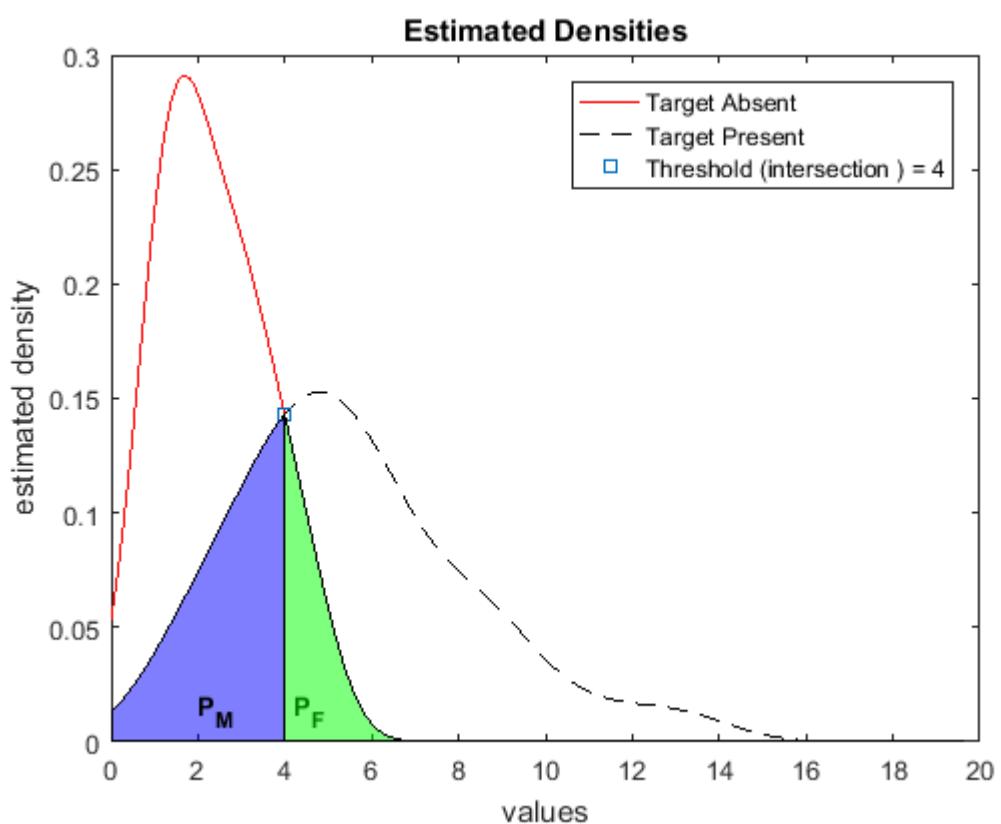
$$P_F = \frac{7}{40} = 0.175 \quad P_M = \frac{1}{5} = 0.2 \quad \text{PPV} = \frac{24}{31} = 0.77419$$

p m shankar

data (Nguyen)

Target Absent					Target Present				
3.374	2.373	0.982	1.694	4.549	1.572	3.719	4.743	3.743	4.894
2.552	2.128	2.046	4.966	1.466	5.63	3.405	6.033	7.158	6.001
1.874	3.164	2.889	2.176	0.996	4.228	4.924	11.104	8.319	13.125
1.105	3.411	2.827	3.073	1.746	5.775	6.567	5.26	1.934	8.703
2.039	2.063	0.891	1.12	3.094	3.585	6.138	1.778	8.967	9.119
1.665	2.846	1.377	1.462	1.372	2.538	4.632	4.362	3.196	7.453
2.957	4.451	1.464	4.161	0.972					
3.842	0.63	3.771	4.013	1.15					

(c) P. M. Shankar



Confusion Matrix: Threshold (intersection) = 4

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	5	35
	Target Present	21	9
	Total Counts	26	44

dist to top left corner of the ROC curve = 0.325

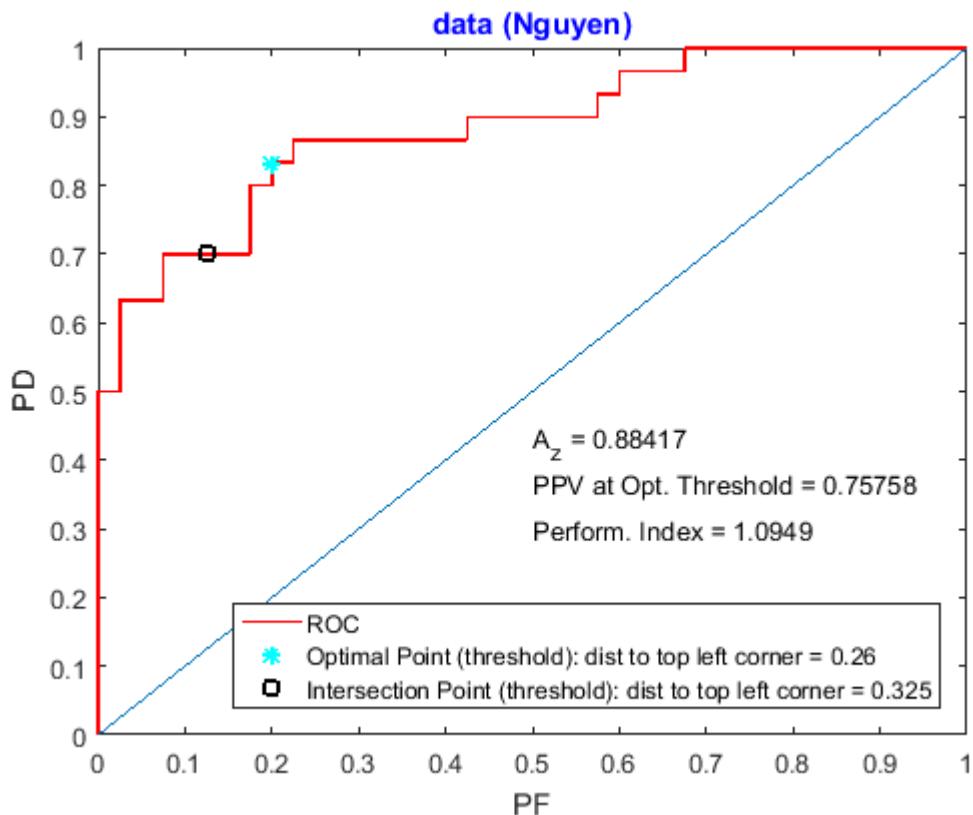
Transition Matrix: Threshold (intersection) = 4

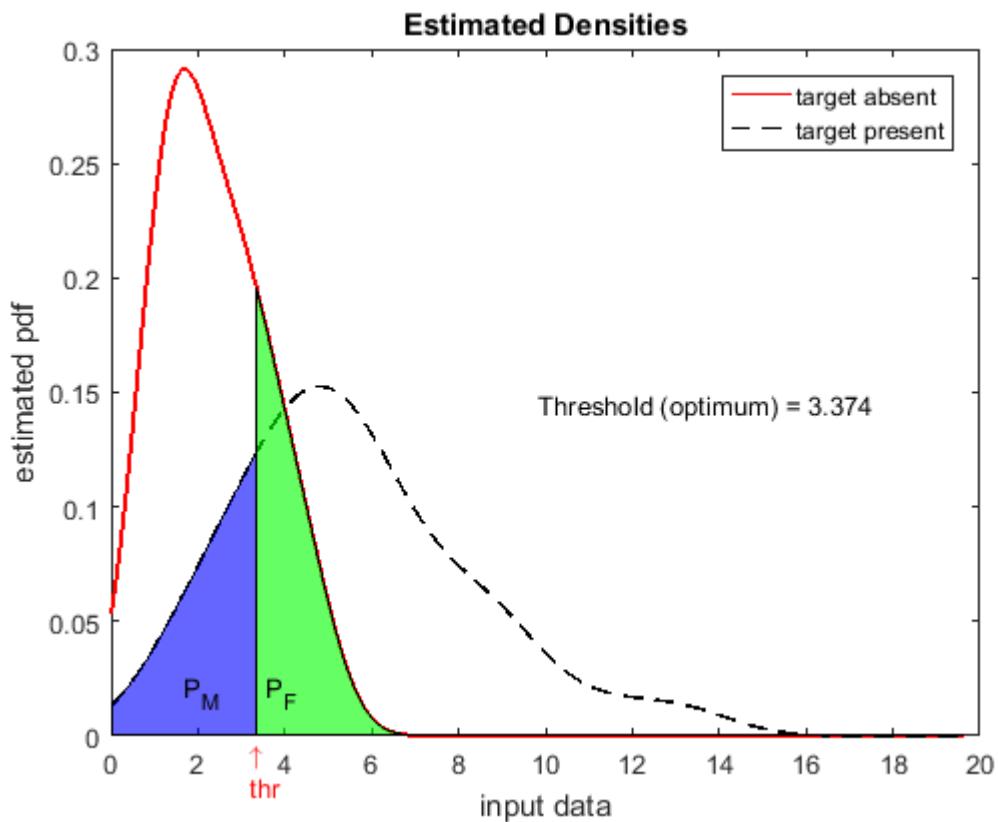
$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{7}{8} & \frac{3}{10} \\ \frac{1}{8} & \frac{7}{10} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.875 & 0.3 \\ 0.125 & 0.7 \end{bmatrix}$$

$$P_F = \frac{1}{8} = 0.125 \quad P_M = \frac{3}{10} = 0.3 \quad \text{PPV} = \frac{21}{26} = 0.80769$$

p m shankar





Confusion Matrix : Threshold (optimum) = 3.374

	Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	8	32	40
	Target Present	25	5	30
	Total Counts	33	37	70

dist to top left corner of the ROC curve = 0.26

Transition Matrix: Threshold (optimum) = 3.374

$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

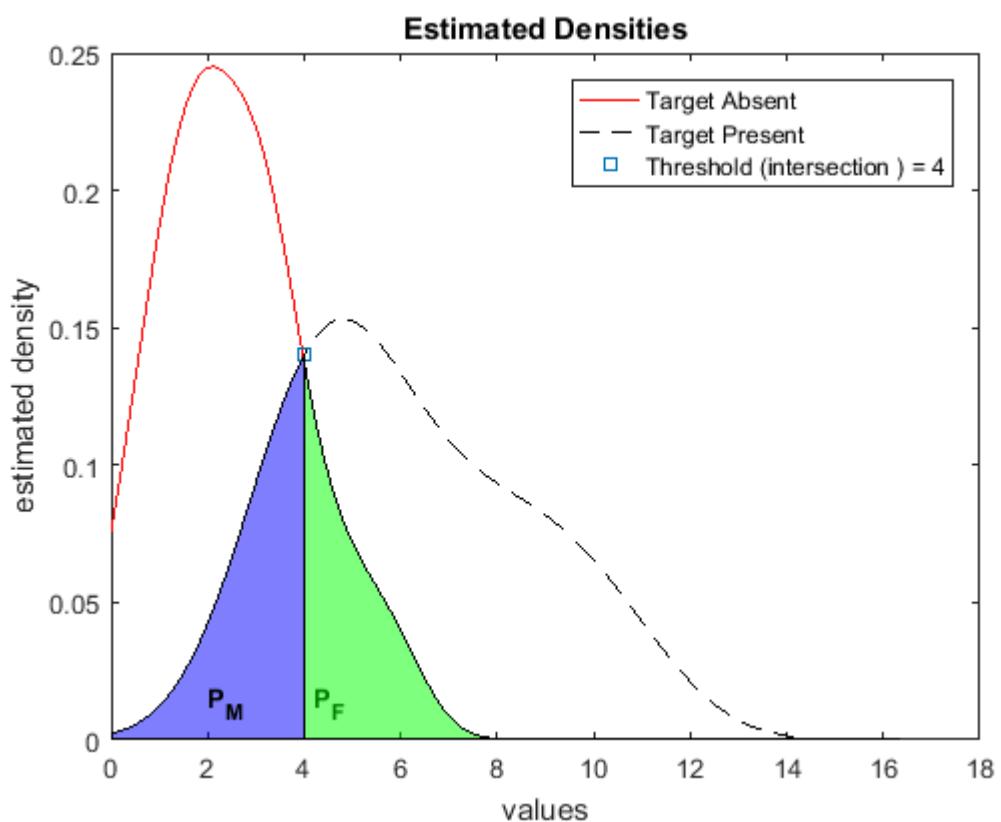
$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{4}{5} & \frac{1}{6} \\ \frac{1}{5} & \frac{5}{6} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.8 & 0.1667 \\ 0.2 & 0.8333 \end{bmatrix}$$

$$P_F = \frac{1}{5} = 0.2 \quad P_M = \frac{1}{6} = 0.16667 \quad \text{PPV} = \frac{25}{33} = 0.75758$$

p m shankar

data (newt)									
Target Absent					Target Present				
4.597	5.169	2.891	1.18	3.216	7.557	4.37	4.015	10.839	4.311
2.983	3.63	1.416	0.649	1.912	8.899	10.92	8.83	7.849	9.361
2.264	3.256	1.741	3.258	5.809	4.834	6.427	3.249	3.567	4.234
0.117	4.169	2.418	3.182	1.31	5.84	6.052	7.485	3.318	9.96
1.666	2.168	5.917	1.953	0.877	5.141	5.11	4.497	9.203	5.503
2.13	3.237	4.684	0.202	1.686	5.175	4.001	3.361	7.39	6.188
1.903	3.337	1.047	0.686	1.812					
3.175	2.286	2.978	3.995	0.909					

(c) P. M. Shankar



Confusion Matrix: Threshold (intersection) = 4

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	6	34
	Target Present	26	4
	Total Counts	32	38

dist to top left corner of the ROC curve = 0.201

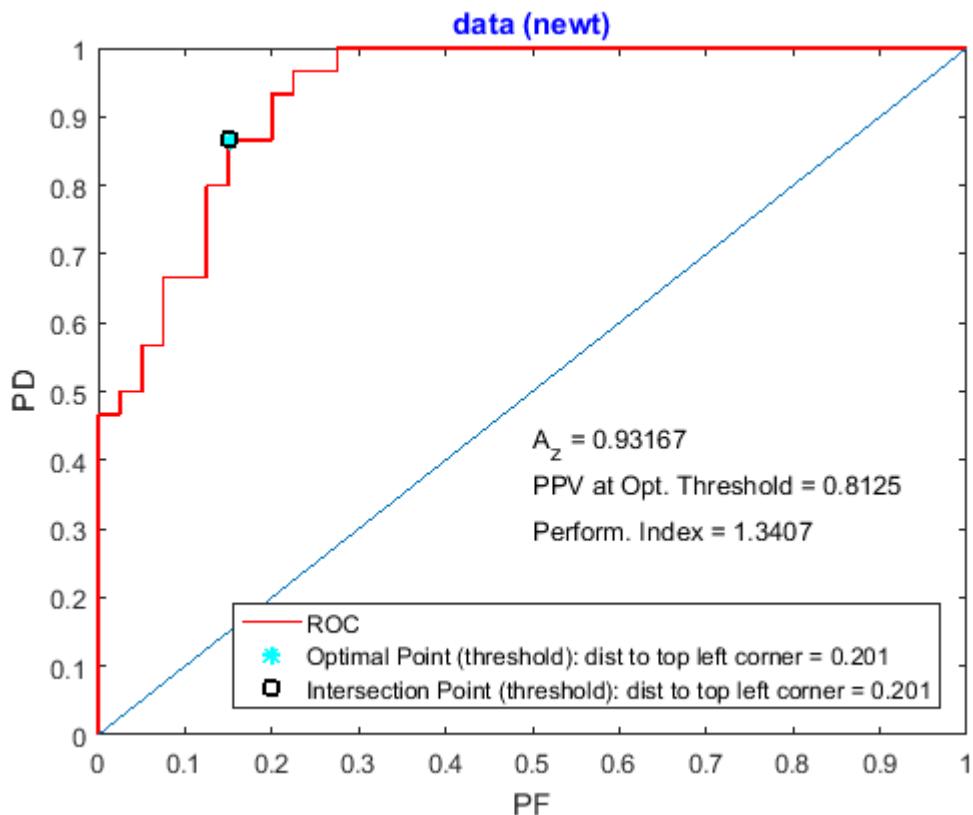
Transition Matrix: Threshold (intersection) = 4

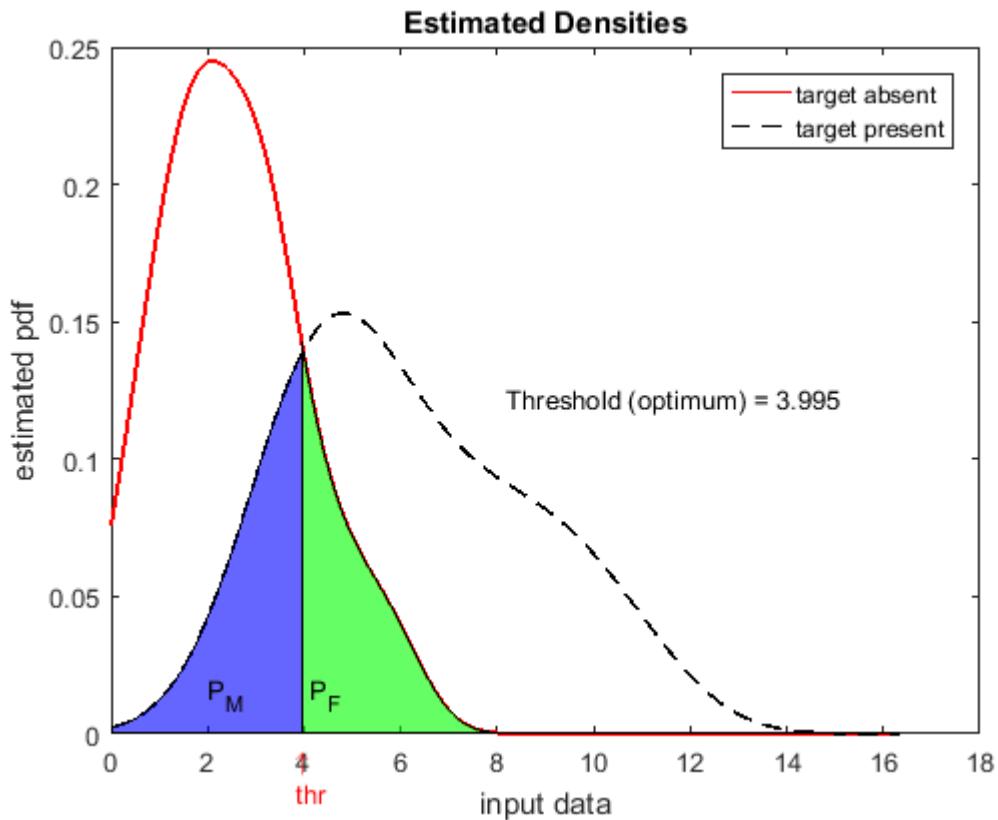
$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{17}{20} & \frac{2}{15} \\ \frac{3}{20} & \frac{13}{15} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.85 & 0.1333 \\ 0.15 & 0.8667 \end{bmatrix}$$

$$P_F = \frac{3}{20} = 0.15 \quad P_M = \frac{2}{15} = 0.1333 \quad \text{PPV} = \frac{13}{16} = 0.8125$$

p m shankar





Confusion Matrix : Threshold (optimum) = 3.995

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	6	34
	Target Present	26	4
	Total Counts	32	38

dist to top left corner of the ROC curve = 0.201

Transition Matrix: Threshold (optimum) = 3.995

$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{17}{20} & \frac{2}{15} \\ \frac{3}{20} & \frac{13}{15} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.85 & 0.1333 \\ 0.15 & 0.8667 \end{bmatrix}$$

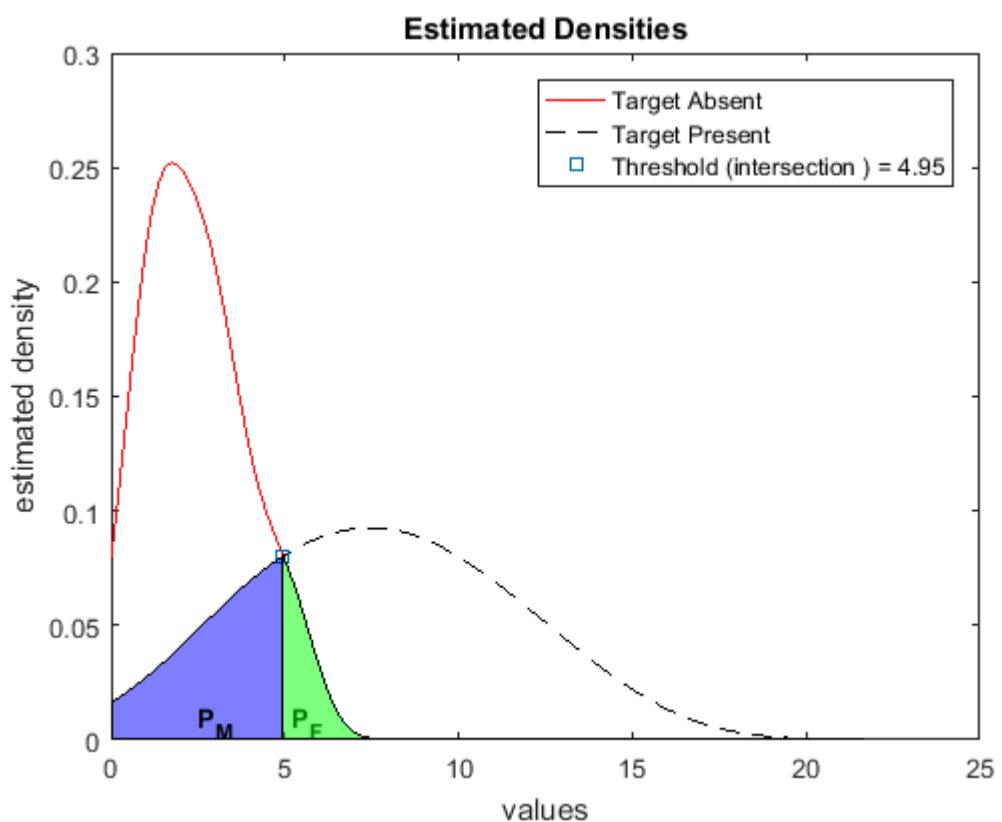
$$P_F = \frac{3}{20} = 0.15 \quad P_M = \frac{2}{15} = 0.1333 \quad \text{PPV} = \frac{13}{16} = 0.8125$$

p m shankar

data (Odemis)

Target Absent					Target Present				
1.172	0.387	3.915	4.498	1.061	3.645	14.461	7.964	11.229	8.278
1.522	0.693	1.974	2.12	1.594	11.131	9.611	13.158	0.922	5.333
2.893	1.355	2.504	1.97	2.937	10.417	6.335	11.352	4.548	7.512
1.114	4.885	0.741	4.028	5.545	6.812	4.592	3.846	11.146	7.848
2.56	3.182	3.03	1.647	2.708	3.142	7.934	8.697	4.551	6.223
1.985	3.428	0.941	2.53	1.389	6.018	8.483	9.456	3.143	13.192
5.067	1.678	0.343	3.507	3.618					
1.03	2.867	2.627	1.286	5.188					

(c) P. M. Shankar



Confusion Matrix: Threshold (intersection) = 4.95

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	3	37
	Target Present	22	8
	Total Counts	25	45

dist to top left corner of the ROC curve = 0.277

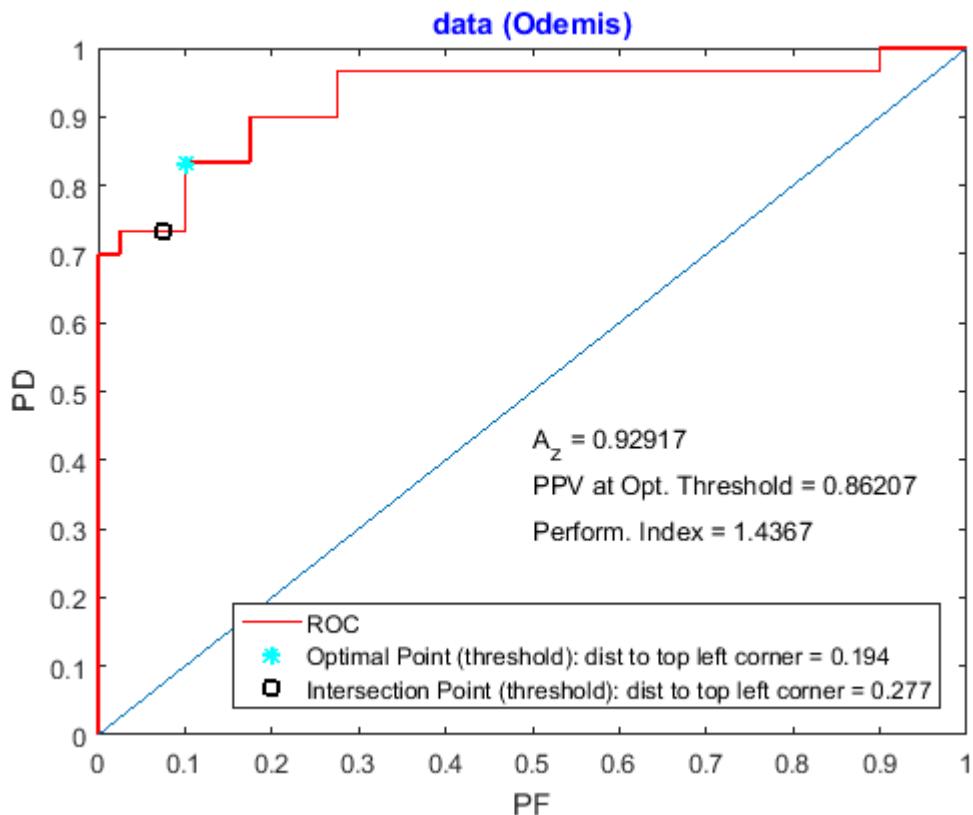
Transition Matrix: Threshold (intersection) = 4.95

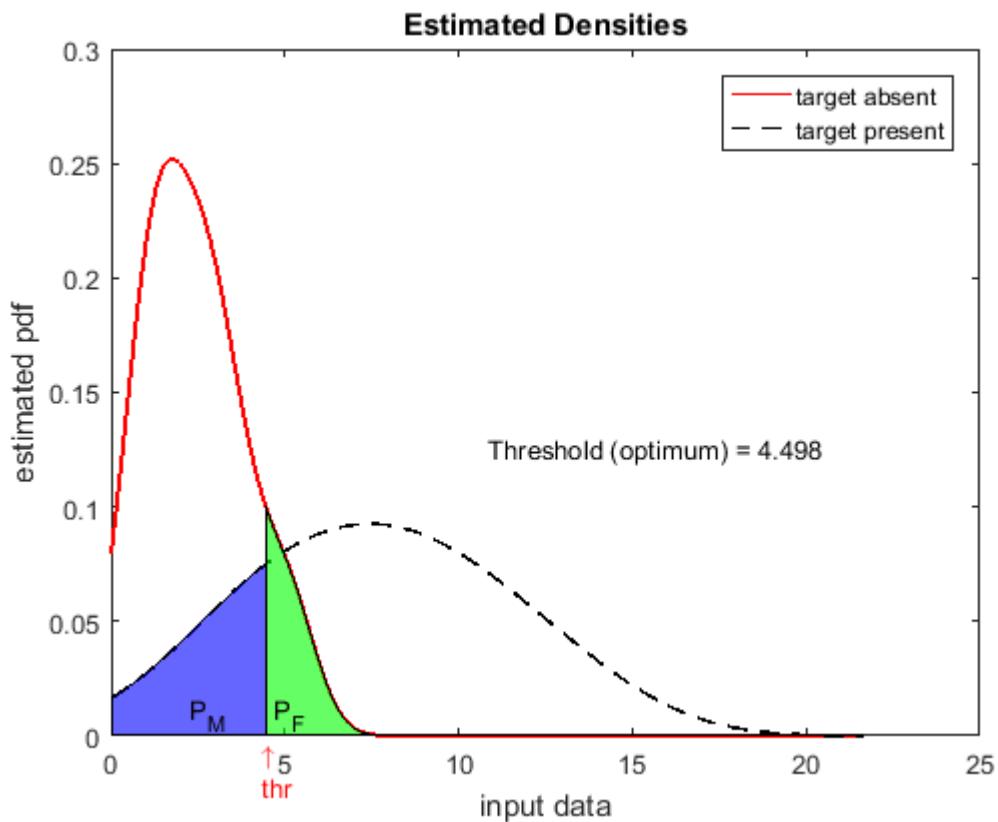
$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{37}{40} & \frac{4}{15} \\ \frac{3}{40} & \frac{11}{15} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.925 & 0.26667 \\ 0.075 & 0.7333 \end{bmatrix}$$

$$P_F = \frac{3}{40} = 0.075 \quad P_M = \frac{4}{15} = 0.26667 \quad \text{PPV} = \frac{22}{25} = 0.88$$

p m shankar





Confusion Matrix : Threshold (optimum) = 4.498

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	4	36
	Target Present	25	5
	Total Counts	29	41

dist to top left corner of the ROC curve = 0.194

Transition Matrix: Threshold (optimum) = 4.498

$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{9}{10} & \frac{1}{6} \\ \frac{1}{10} & \frac{5}{6} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.9 & 0.1667 \\ 0.1 & 0.8333 \end{bmatrix}$$

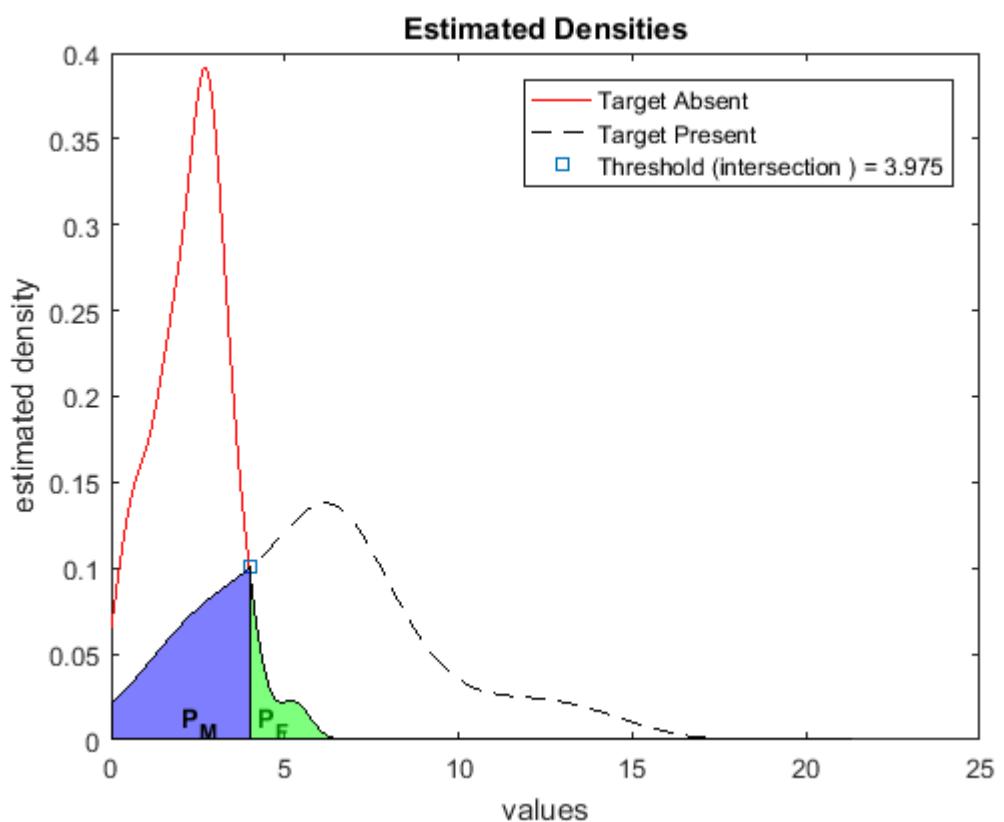
$$P_F = \frac{1}{10} = 0.1 \quad P_M = \frac{1}{6} = 0.16667 \quad \text{PPV} = \frac{25}{29} = 0.86207$$

p m shankar

data (Owsiany)

Target Absent					Target Present				
2.547	1.613	2.034	2.562	3.395	8.771	2.516	4.368	14.205	6.22
1.375	2.892	2.024	2.864	2.692	4.895	9.802	3.073	5.907	11.579
3.12	0.378	1.803	2.571	2.808	8.219	5.736	3.36	1.06	7.221
1.831	3.131	0.532	1.927	2.562	6.319	3.287	7.895	6.432	6.587
1.969	2.632	1.123	0.824	5.267	12.484	1.989	6.686	5.787	3.268
2.909	1.472	2.879	3.711	2.784	6.322	4.562	1.448	6.135	6.927
2.542	4.043	0.882	0.269	1.556					
2.746	0.553	3.499	3.774	2.764					

(c) P. M. Shankar



Confusion Matrix: Threshold (intersection) = 3.975

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	2	38
	Target Present	22	8
	Total Counts	24	46

dist to top left corner of the ROC curve = 0.271

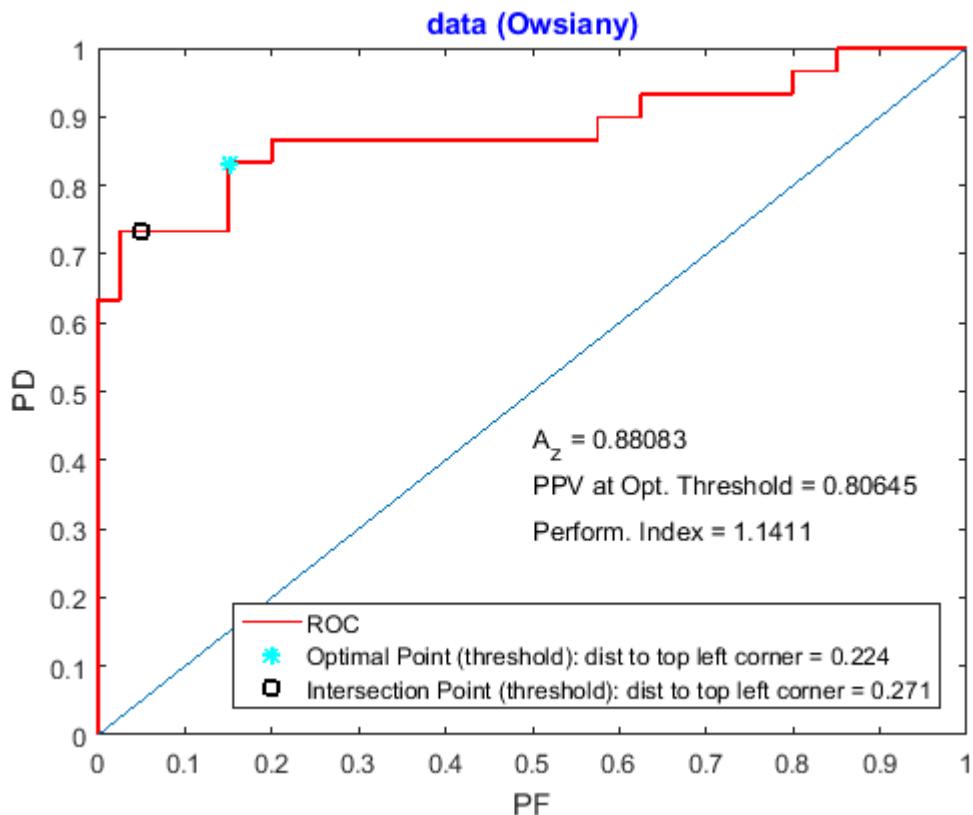
Transition Matrix: Threshold (intersection) = 3.975

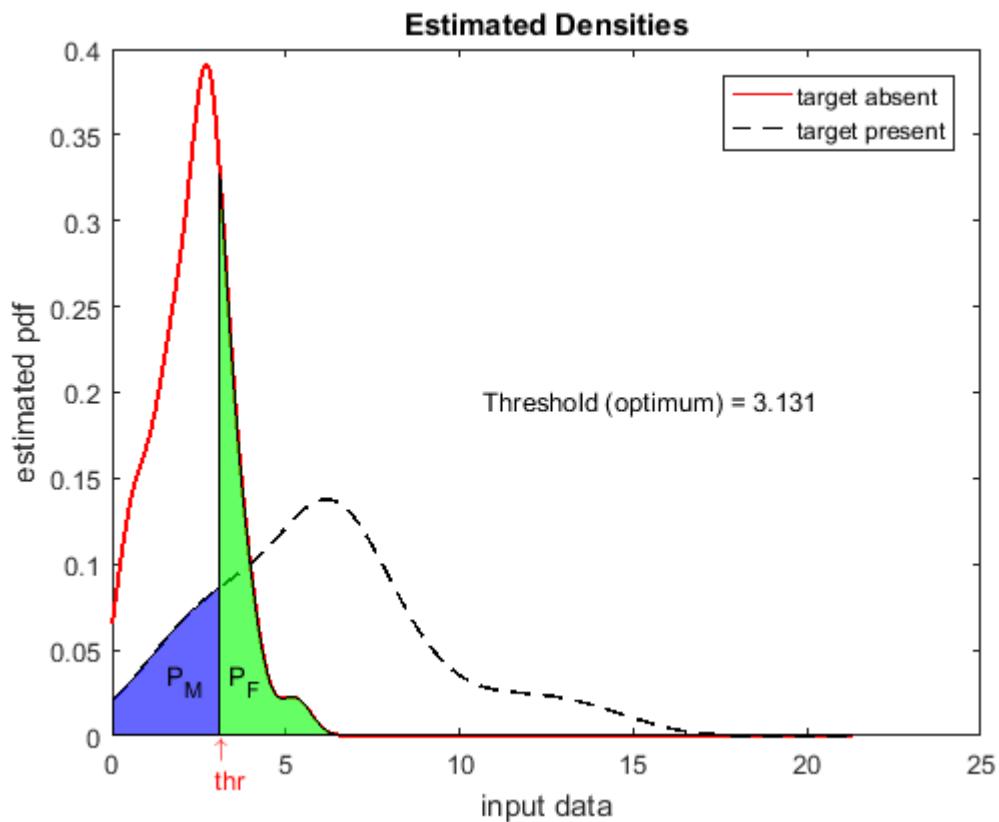
$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{19}{20} & \frac{4}{15} \\ \frac{1}{20} & \frac{11}{15} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.95 & 0.26667 \\ 0.05 & 0.7333 \end{bmatrix}$$

$$P_F = \frac{1}{20} = 0.05 \quad P_M = \frac{4}{15} = 0.26667 \quad \text{PPV} = \frac{11}{12} = 0.91667$$

p m shankar





Confusion Matrix : Threshold (optimum) = 3.131

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	6	34
	Target Present	25	5
	Total Counts	31	39

dist to top left corner of the ROC curve = 0.224

Transition Matrix: Threshold (optimum) = 3.131

$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{17}{20} & \frac{1}{6} \\ \frac{3}{20} & \frac{5}{6} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.85 & 0.16667 \\ 0.15 & 0.8333 \end{bmatrix}$$

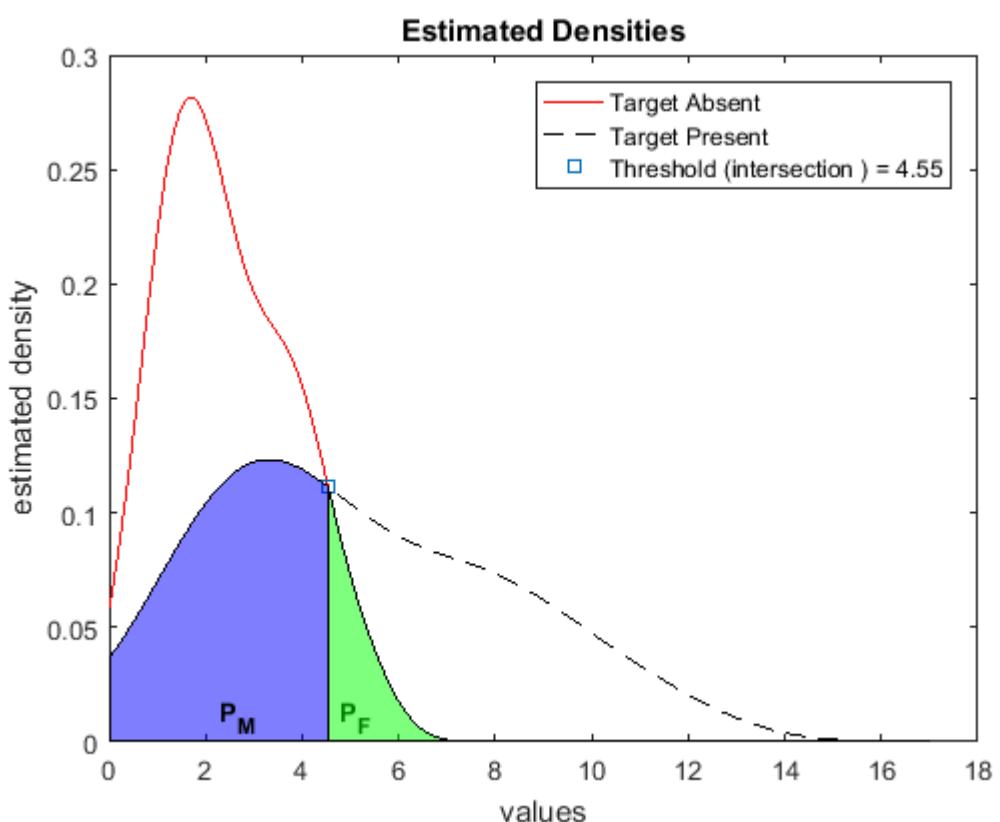
$$P_F = \frac{3}{20} = 0.15 \quad P_M = \frac{1}{6} = 0.16667 \quad \text{PPV} = \frac{25}{31} = 0.80645$$

p m shankar

data (Panagiotou)

Target Absent					Target Present				
1.959	0.822	3.463	1.261	2.224	2.324	3.767	7.289	8.71	2.437
1.393	1.622	2.451	3.392	3.772	0.644	3.871	2.442	8.146	2.854
3.082	3.994	2.045	1.323	3.922	3.301	4.522	3.41	8.039	6.082
2.399	3.65	4.263	0.961	0.356	7.446	9.44	11.342	6.661	2.096
3.021	1.551	1.621	5.274	1.081	11.096	2.305	5.302	1.765	5.01
3.769	1.612	2.151	4.534	1.042	1.903	3.704	9.018	4.142	5.981
0.715	2.581	1.989	4.065	1.273					
5.146	1.433	2.748	1.647	2.391					

(c) P. M. Shankar



Confusion Matrix: Threshold (intersection) = 4.55

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	2	38
	Target Present	14	16
	Total Counts	16	54

dist to top left corner of the ROC curve = 0.536

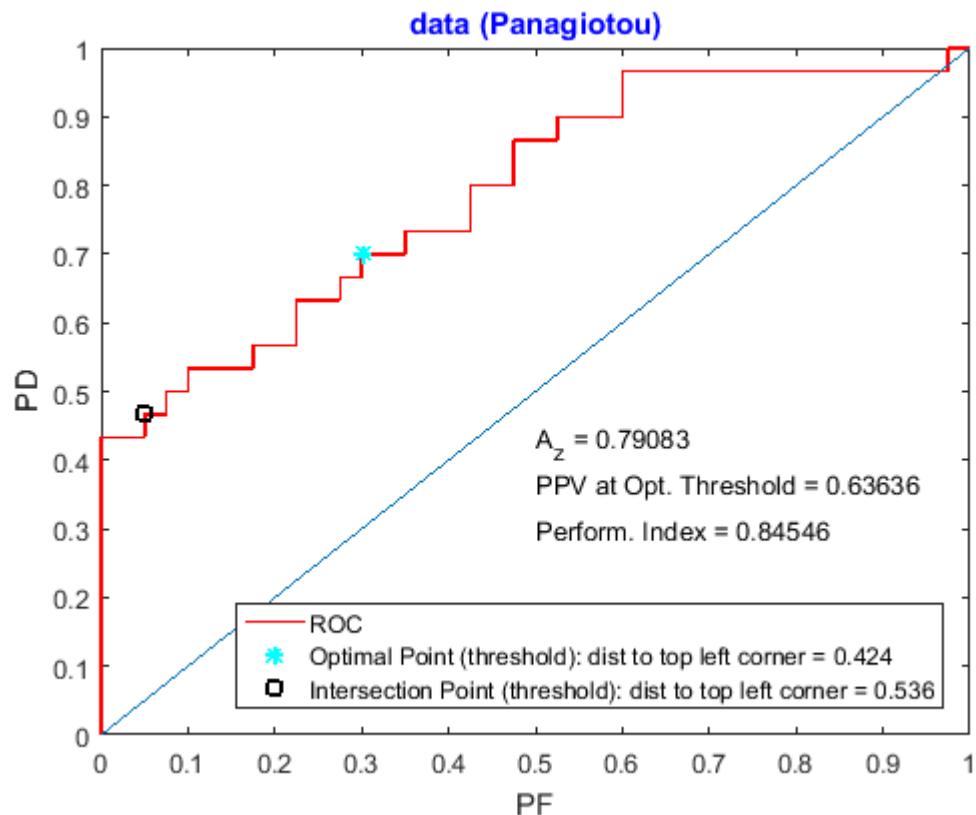
Transition Matrix: Threshold (intersection) = 4.55

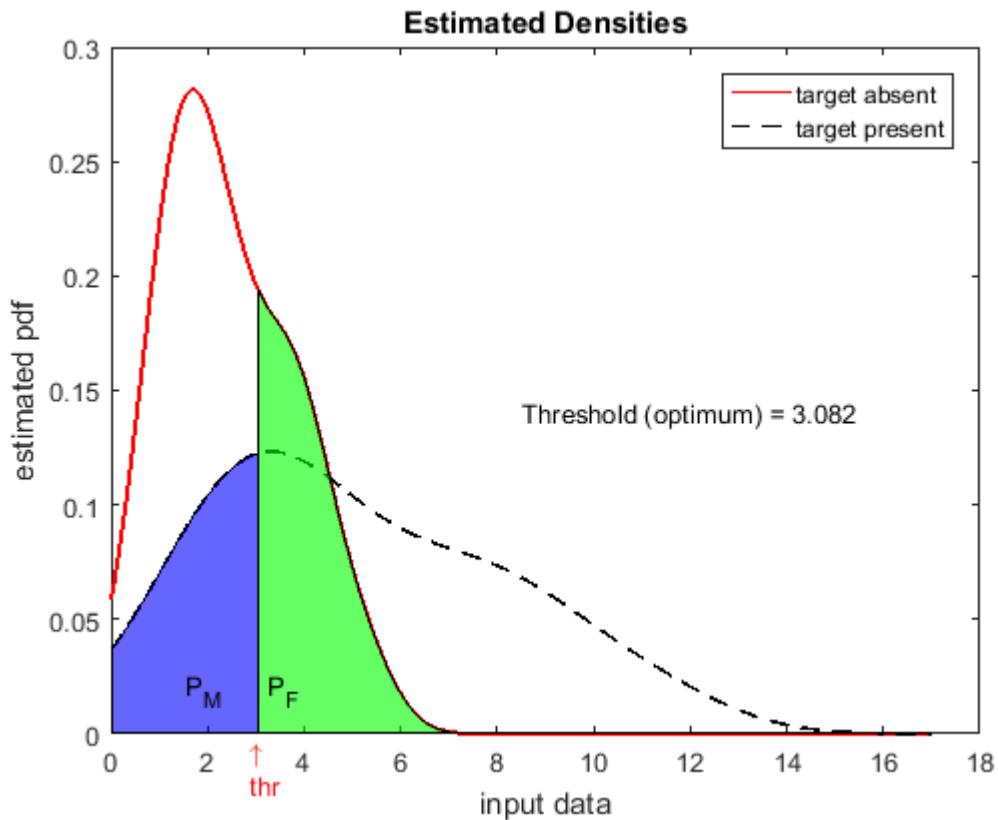
$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{19}{20} & \frac{8}{15} \\ \frac{1}{20} & \frac{7}{15} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.95 & 0.5333 \\ 0.05 & 0.4667 \end{bmatrix}$$

$$P_F = \frac{1}{20} = 0.05 \quad P_M = \frac{8}{15} = 0.5333 \quad \text{PPV} = \frac{7}{8} = 0.875$$

p m shankar





Confusion Matrix : Threshold (optimum) = 3.082

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	12	28
	Target Present	21	9
	Total Counts	33	37

dist to top left corner of the ROC curve = 0.424

Transition Matrix: Threshold (optimum) = 3.082

$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{7}{10} & \frac{3}{10} \\ \frac{3}{10} & \frac{7}{10} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.7 & 0.3 \\ 0.3 & 0.7 \end{bmatrix}$$

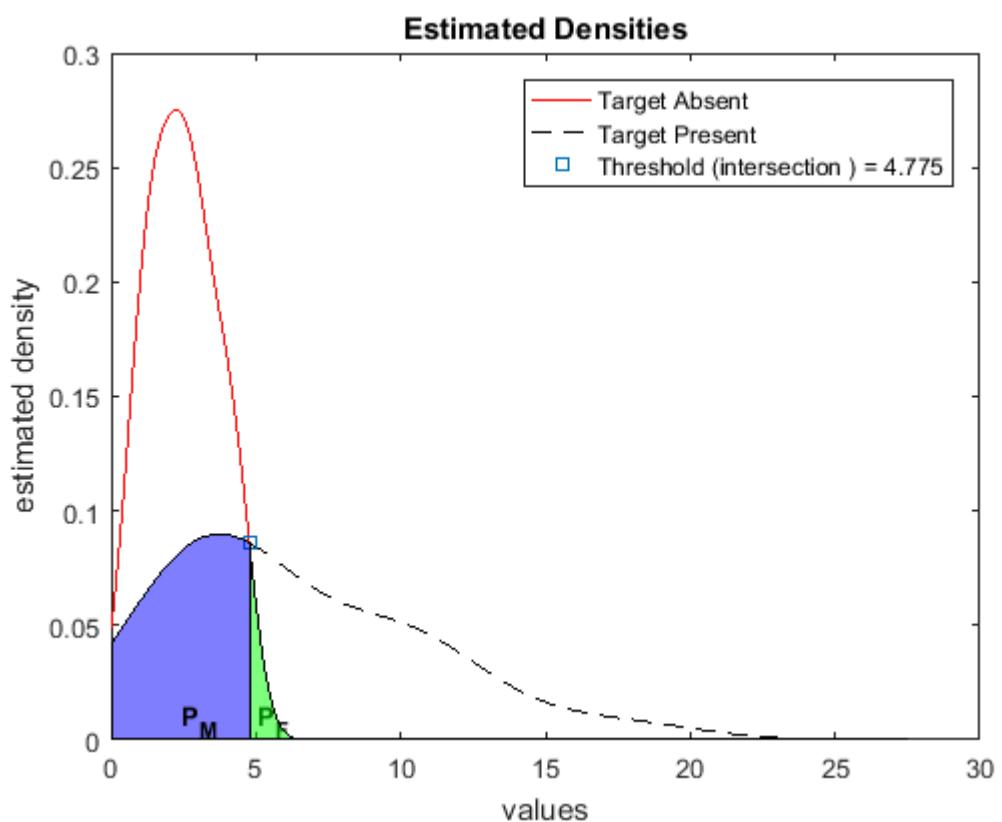
$$P_F = \frac{3}{10} = 0.3 \quad P_M = \frac{3}{10} = 0.3 \quad \text{PPV} = \frac{7}{11} = 0.63636$$

p m shankar

data (Papadimitriou)

Target Absent					Target Present				
4.278	2.11	2.412	0.983	2.662	2.546	1.998	8.222	2.114	6.747
2.39	0.646	2.724	3.256	1.647	9.701	11.798	3.642	11.831	10.2
1.992	1.383	0.841	4.416	2.374	4.351	7.9	2.612	3.651	3.367
2.764	1.73	3.065	1.144	1.207	2.109	1.77	4.117	10.857	1.333
4.076	1.778	2.849	1.697	4.356	10.389	9.862	5.167	2.093	5.466
3.949	1.631	1.4	4.301	4.288	5.652	18.358	5.377	15.167	4.058
1.063	2.575	2.562	1.354	0.666					
2.918	3.384	3.554	3.61	2.762					

(c) P. M. Shankar



Confusion Matrix: Threshold (intersection) = 4.775

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	0	40
	Target Present	16	14
	Total Counts	16	54

dist to top left corner of the ROC curve = 0.467

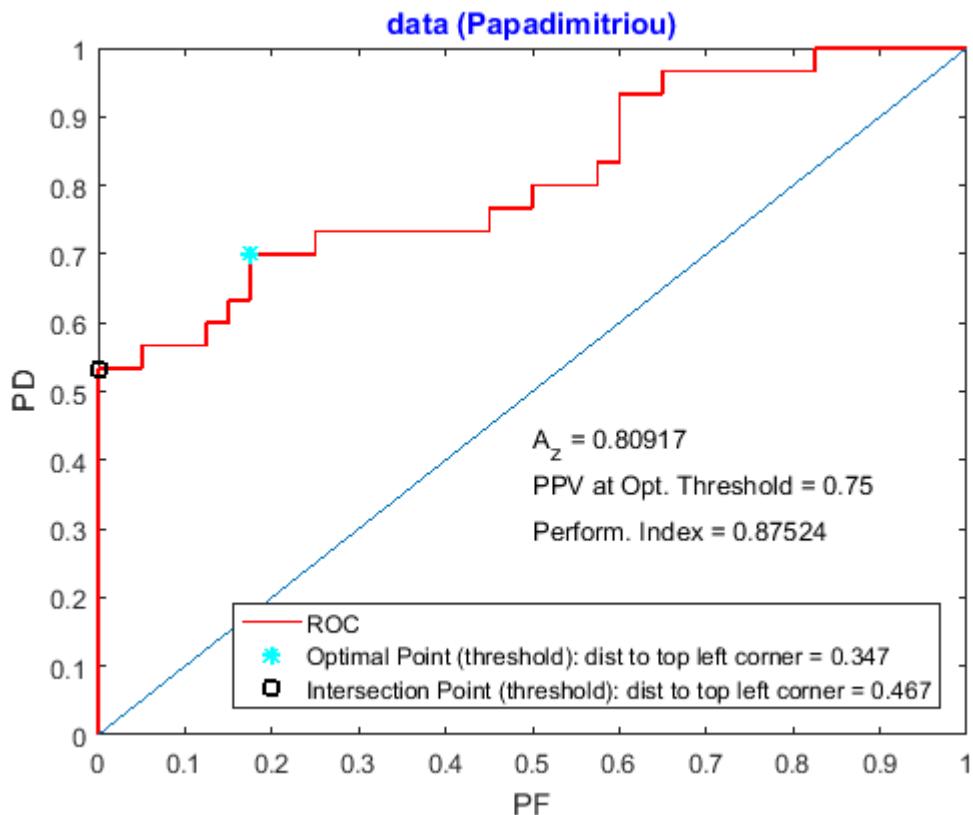
Transition Matrix: Threshold (intersection) = 4.775

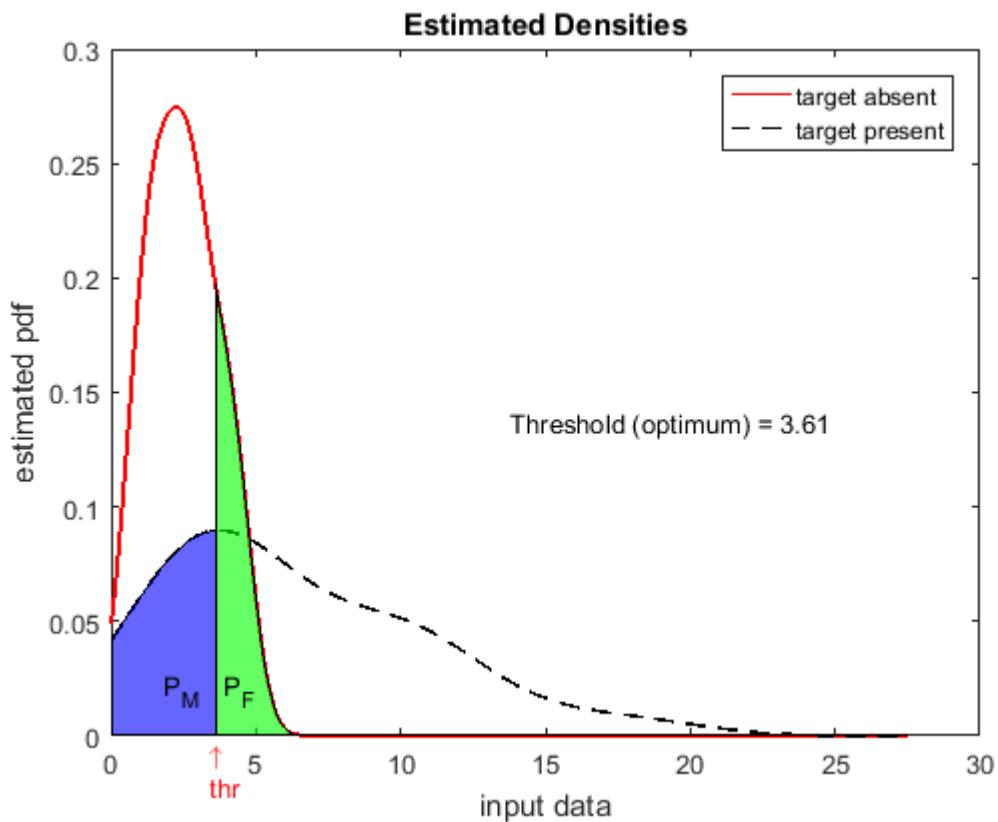
$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} 1 & \frac{7}{15} \\ 0 & \frac{8}{15} \end{bmatrix} \Rightarrow \begin{bmatrix} 1 & 0.46667 \\ 0 & 0.5333 \end{bmatrix}$$

$$P_F = 0 = 0 \quad P_M = \frac{7}{15} = 0.46667 \quad \text{PPV} = 1 = 1$$

p m shankar





Confusion Matrix : Threshold (optimum) = 3.61

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	7	33
	Target Present	21	9
	Total Counts	28	42

dist to top left corner of the ROC curve = 0.347

Transition Matrix: Threshold (optimum) = 3.61

$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{33}{40} & \frac{3}{10} \\ \frac{7}{40} & \frac{7}{10} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.825 & 0.3 \\ 0.175 & 0.7 \end{bmatrix}$$

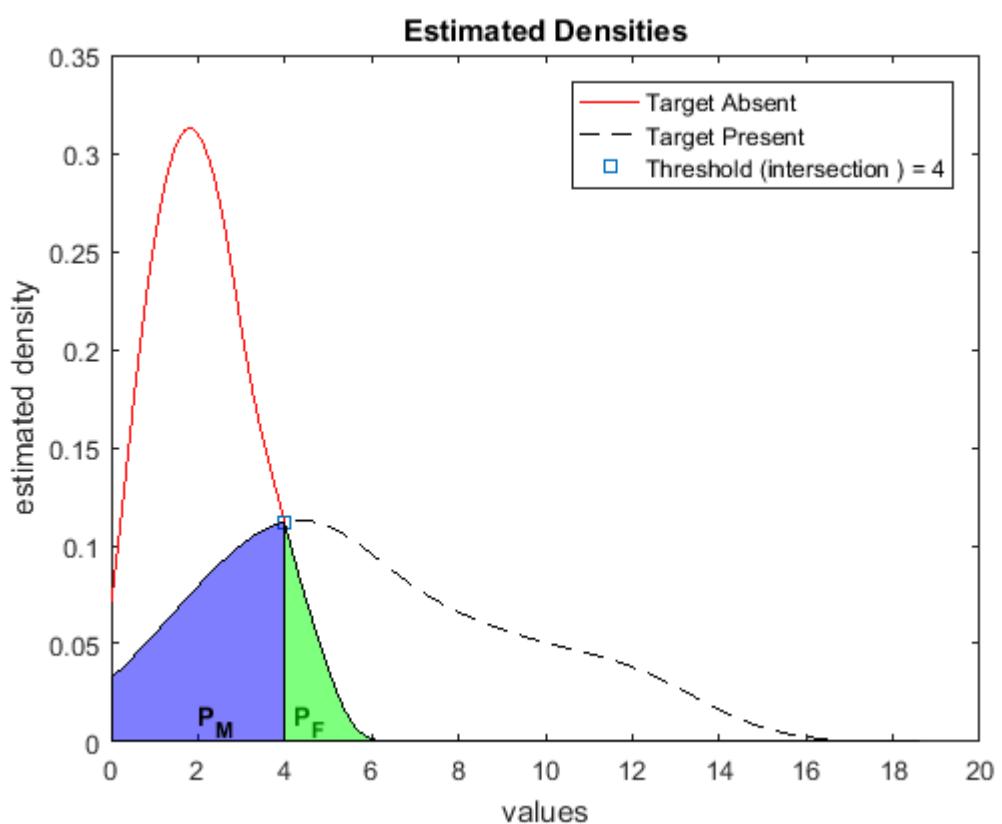
$$P_F = \frac{7}{40} = 0.175 \quad P_M = \frac{3}{10} = 0.3 \quad \text{PPV} = \frac{3}{4} = 0.75$$

p m shankar

data (Peng)

Target Absent					Target Present				
1.934	0.568	0.48	1.277	0.843	4.999	1.953	4.653	11.264	4.139
1.303	1.441	1.06	1.541	1.034	2.817	7.183	2.893	4.538	4.684
3.954	4.748	1.579	0.785	3.209	3.157	1.637	5.084	5.012	12.425
2.235	1.675	3.881	3.568	2.64	2.276	8.529	4.357	4.451	5.373
2.452	2.599	2.194	4.59	1.779	12.18	10.065	11.923	1.653	8.1
1.716	3.455	0.589	2.934	2.664	7.277	5.416	0.564	8.968	8.398
3.001	2.418	1.999	0.36	2.518					
1.676	3.765	2.569	1.847	0.976					

(c) P. M. Shankar



Confusion Matrix: Threshold (intersection) = 4

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	2	38
	Target Present	22	8
	Total Counts	24	46

dist to top left corner of the ROC curve = 0.271

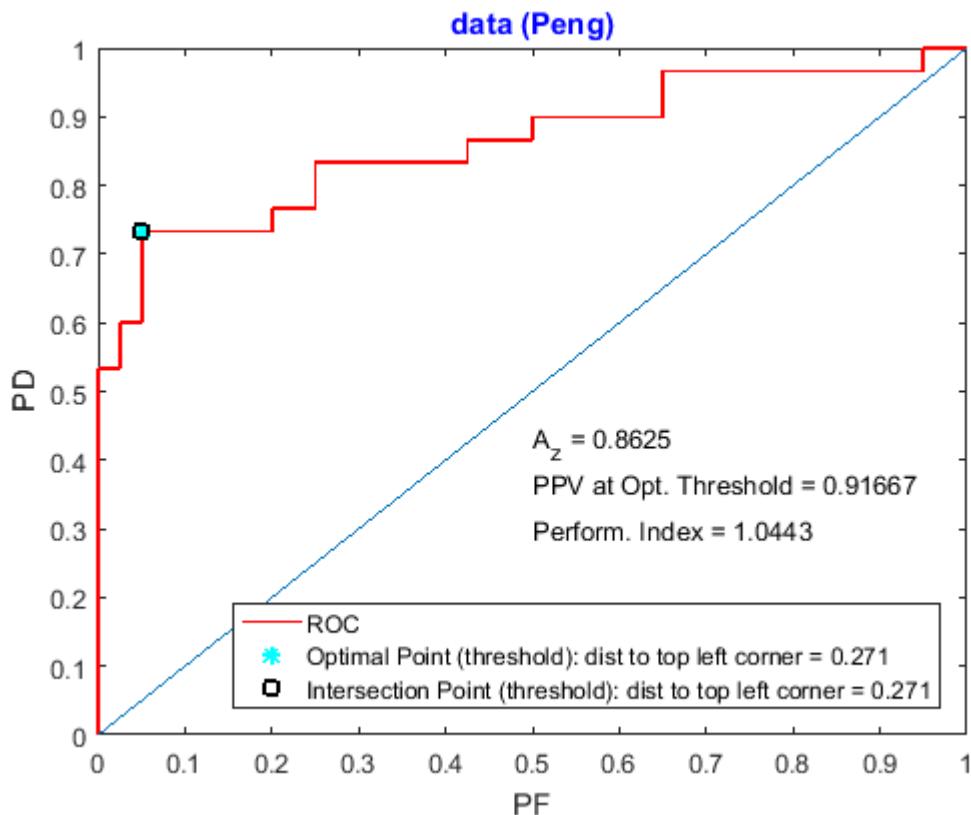
Transition Matrix: Threshold (intersection) = 4

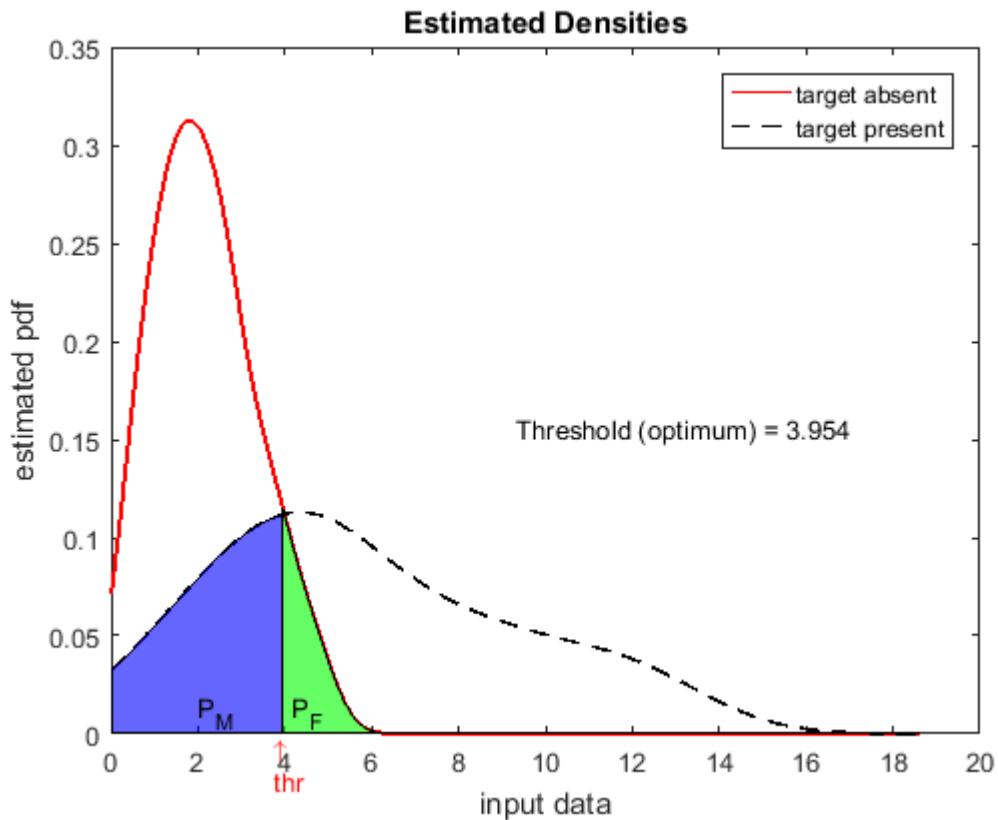
$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{19}{20} & \frac{4}{15} \\ \frac{1}{20} & \frac{11}{15} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.95 & 0.26667 \\ 0.05 & 0.7333 \end{bmatrix}$$

$$P_F = \frac{1}{20} = 0.05 \quad P_M = \frac{4}{15} = 0.26667 \quad \text{PPV} = \frac{11}{12} = 0.91667$$

p m shankar





Confusion Matrix : Threshold (optimum) = 3.954

Data Collected		Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	2	38	40
	Target Present	22	8	30
	Total Counts	24	46	70

dist to top left corner of the ROC curve = 0.271

Transition Matrix: Threshold (optimum) = 3.954

$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{19}{20} & \frac{4}{15} \\ \frac{1}{20} & \frac{11}{15} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.95 & 0.26667 \\ 0.05 & 0.7333 \end{bmatrix}$$

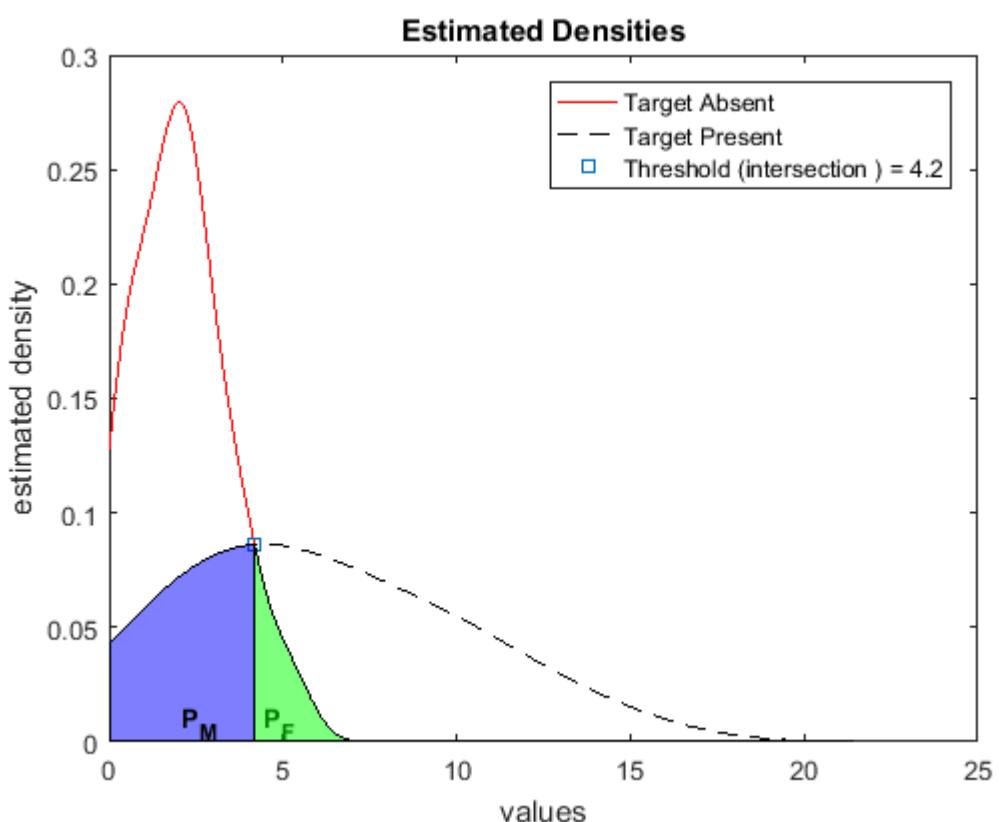
$$P_F = \frac{1}{20} = 0.05 \quad P_M = \frac{4}{15} = 0.26667 \quad \text{PPV} = \frac{11}{12} = 0.91667$$

p m shankar

data (Peschansky)

Target Absent					Target Present				
1.605	0.317	2.403	2.581	1.154	1.864	3.086	0.621	6.923	2.349
2.859	3.583	2.444	3.357	0.431	11.453	4.029	9.643	3.203	6.475
3.569	4.923	1.425	3.805	5.351	10.217	8.482	4.666	10.465	7.584
2.642	0.761	1.706	2.491	0.924	5.525	9.444	4.887	7.102	4.182
4.222	0.512	2.35	2.063	2.204	14.28	1.496	1.981	5.305	4.307
0.422	2.898	0.119	2.351	1.434	1.19	9.974	13.543	5.736	1.171
0.216	0.534	0.316	1.788	3.779					
1.758	1.575	1.557	1.948	2.232					

(c) P. M. Shankar



Confusion Matrix: Threshold (intersection) = 4.2

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	3	37
	Target Present	19	11
	Total Counts	22	48

dist to top left corner of the ROC curve = 0.374

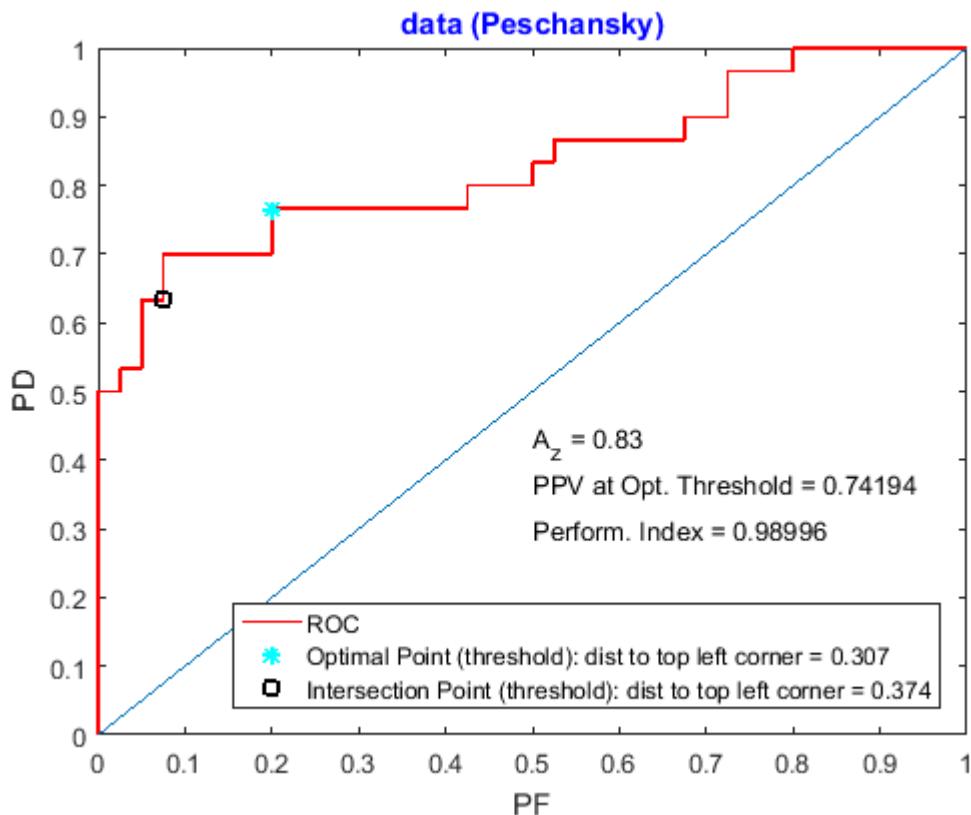
Transition Matrix: Threshold (intersection) = 4.2

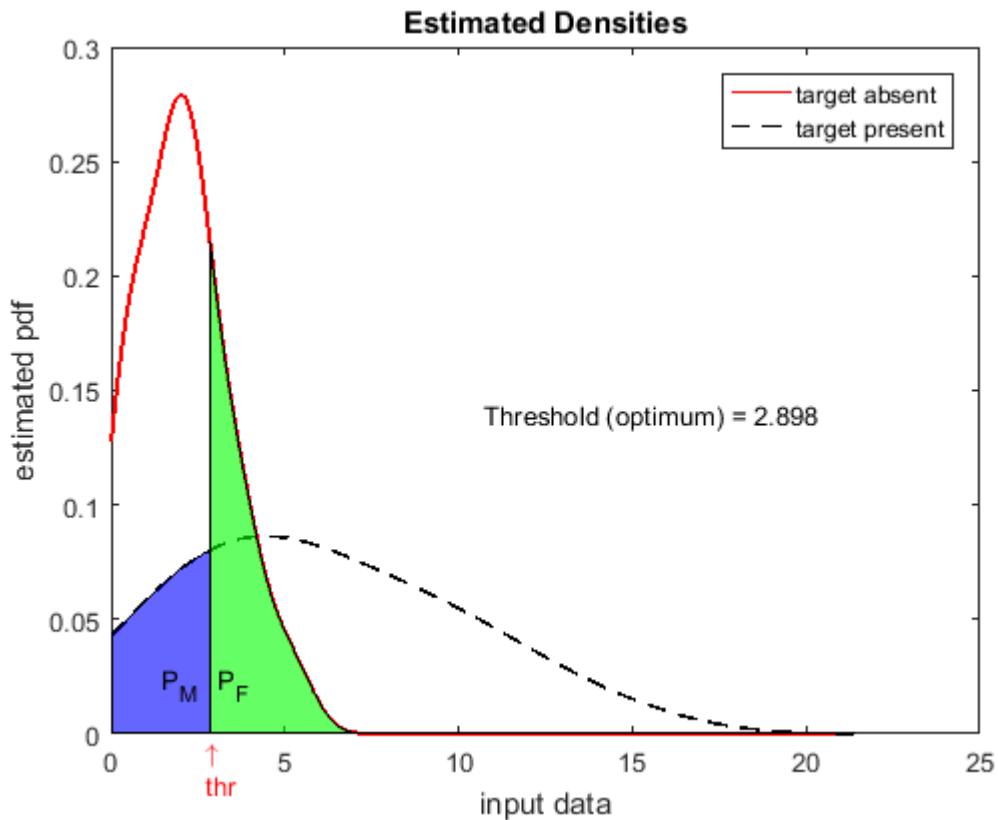
$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{37}{40} & \frac{11}{30} \\ \frac{3}{40} & \frac{19}{30} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.925 & 0.36667 \\ 0.075 & 0.6333 \end{bmatrix}$$

$$P_F = \frac{3}{40} = 0.075 \quad P_M = \frac{11}{30} = 0.36667 \quad \text{PPV} = \frac{19}{22} = 0.86364$$

p m shankar





Confusion Matrix : Threshold (optimum) = 2.898

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	8	32
	Target Present	23	7
	Total Counts	31	39

dist to top left corner of the ROC curve = 0.307

Transition Matrix: Threshold (optimum) = 2.898

$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{4}{5} & \frac{7}{30} \\ \frac{1}{5} & \frac{23}{30} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.8 & 0.2333 \\ 0.2 & 0.7667 \end{bmatrix}$$

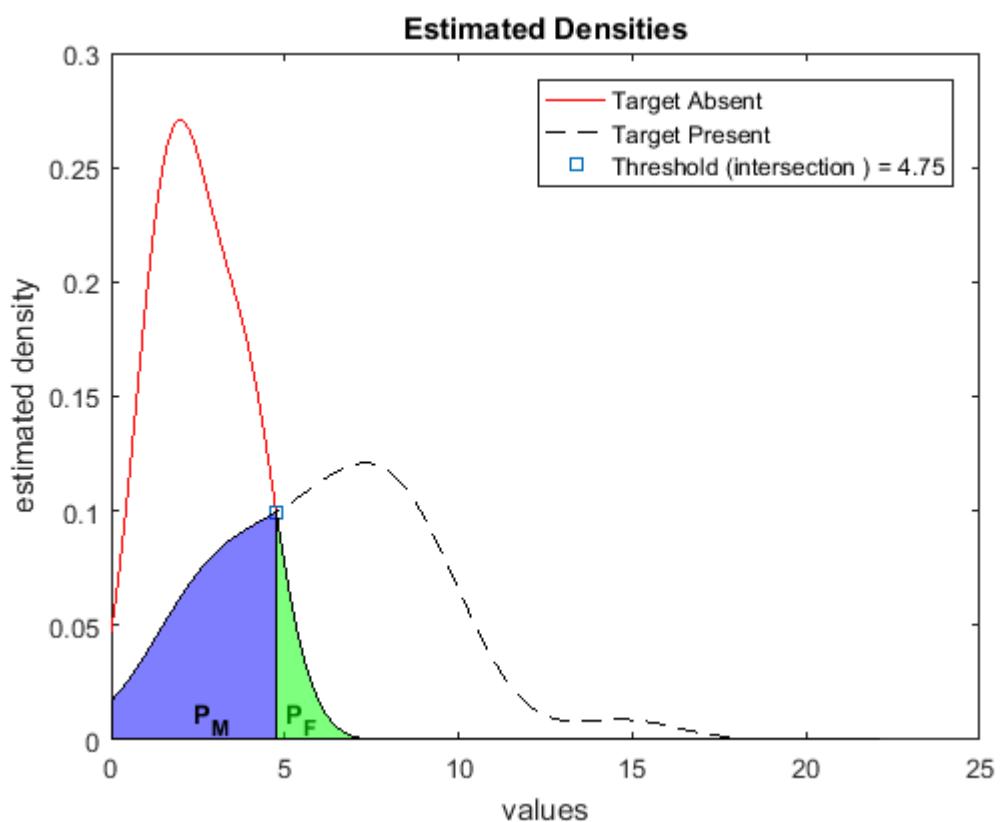
$$P_F = \frac{1}{5} = 0.2 \quad P_M = \frac{7}{30} = 0.2333 \quad \text{PPV} = \frac{23}{31} = 0.74194$$

p m shankar

data (Pham)

Target Absent					Target Present				
2.588	3.243	1.706	2.691	1.762	2.888	4.681	1.736	1.69	8.71
1.273	2.631	2.683	4.161	0.806	6.434	10.336	8.094	7.636	6.494
3.512	0.904	1.881	1.076	1.756	4.646	6.059	9.229	8.32	14.747
2.403	3.514	5.369	1.28	4.424	2.73	6.851	9.151	3.988	8.181
1.361	2.269	1.268	1.634	2.439	9.558	5.195	6.911	5.249	6.312
2.26	2.458	4.153	3.963	4.641	7.567	2.572	3.2	3.467	8.472
3.852	3.28	3.379	2.36	1.486					
3.862	1.951	4.205	0.83	1.388					

(c) P. M. Shankar



Confusion Matrix: Threshold (intersection) = 4.75

Data Collected	Target Detected	Target Not Detected	Total Counts
Target Absent	1	39	40
Target Present	20	10	30
Total Counts	21	49	70

dist to top left corner of the ROC curve = 0.334

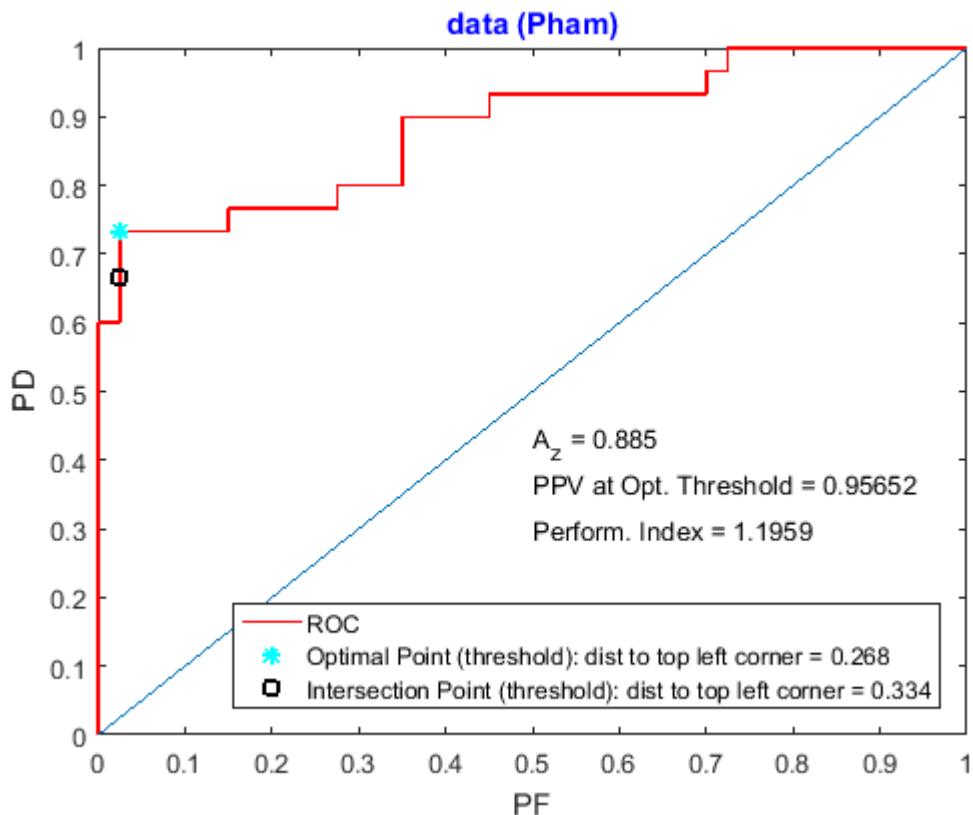
Transition Matrix: Threshold (intersection) = 4.75

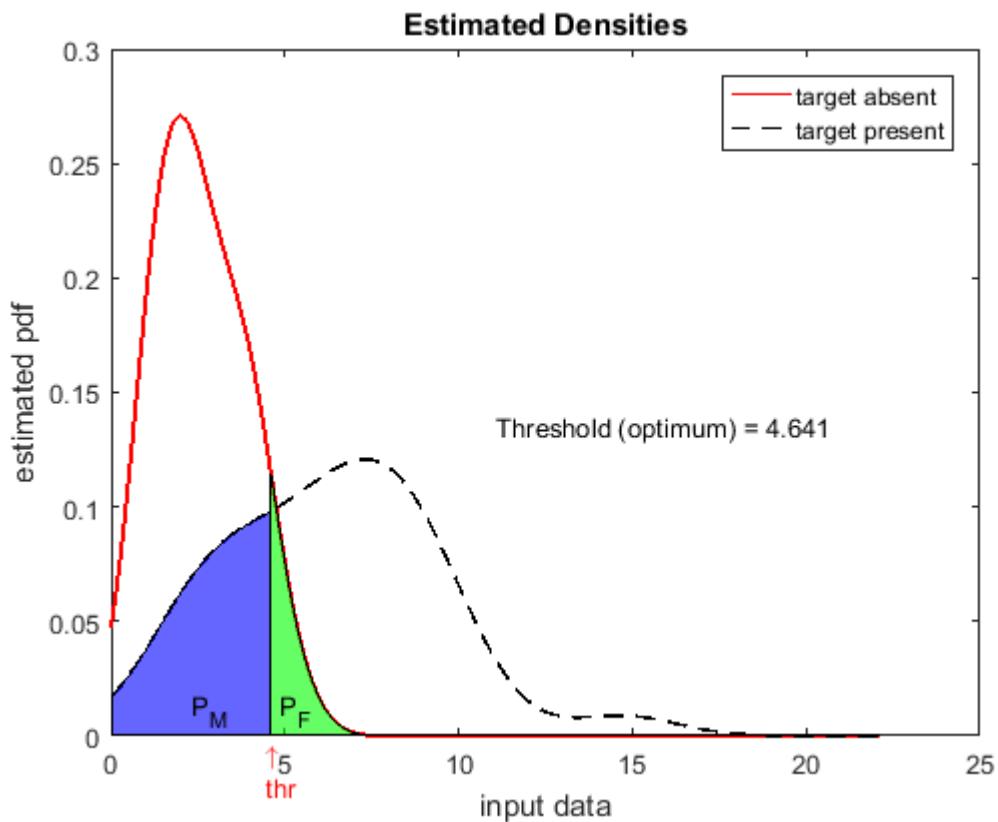
$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{39}{40} & \frac{1}{3} \\ \frac{1}{40} & \frac{2}{3} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.975 & 0.3333 \\ 0.025 & 0.6667 \end{bmatrix}$$

$$P_F = \frac{1}{40} = 0.025 \quad P_M = \frac{1}{3} = 0.33333 \quad \text{PPV} = \frac{20}{21} = 0.95238$$

p m shankar





Confusion Matrix : Threshold (optimum) = 4.641

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	1	39
	Target Present	22	8
	Total Counts	23	47

dist to top left corner of the ROC curve = 0.268

Transition Matrix: Threshold (optimum) = 4.641

$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{39}{40} & \frac{4}{15} \\ \frac{1}{40} & \frac{11}{15} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.975 & 0.2667 \\ 0.025 & 0.7333 \end{bmatrix}$$

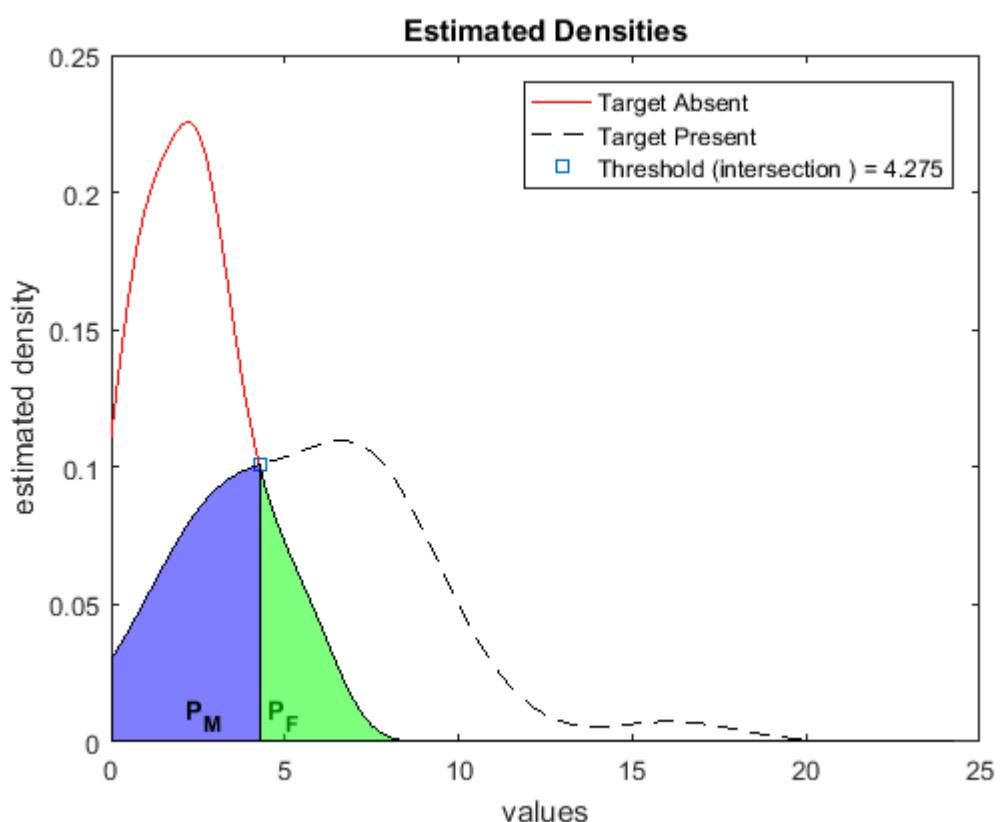
$$P_F = \frac{1}{40} = 0.025 \quad P_M = \frac{4}{15} = 0.26667 \quad \text{PPV} = \frac{22}{23} = 0.95652$$

p m shankar

data (Pizzo)

Target Absent					Target Present				
2.534	2.804	2.885	0.733	0.244	6.292	10.782	5.627	3.343	6.699
2.044	4.953	3.975	0.161	2.152	5.167	2.749	8.045	0.552	8.112
0.5	6.227	2.838	0.496	1.268	6.076	3.425	6.902	16.181	2.123
2.397	1.162	2.235	0.618	2.946	3.804	3.969	2.962	7.133	8.47
0.749	2.88	3.56	1.218	4.388	3.039	6.552	7.313	7.274	3.679
5.8	4.106	1.808	5.37	4.471	1.429	8.465	9.141	8.229	2.539
2.108	3.034	0.551	2.599	2.002					
2.67	0.922	2.69	0.819	1.509					

(c) P. M. Shankar



Confusion Matrix: Threshold (intersection) = 4.275

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	6	34
	Target Present	18	12
	Total Counts	24	46

dist to top left corner of the ROC curve = 0.427

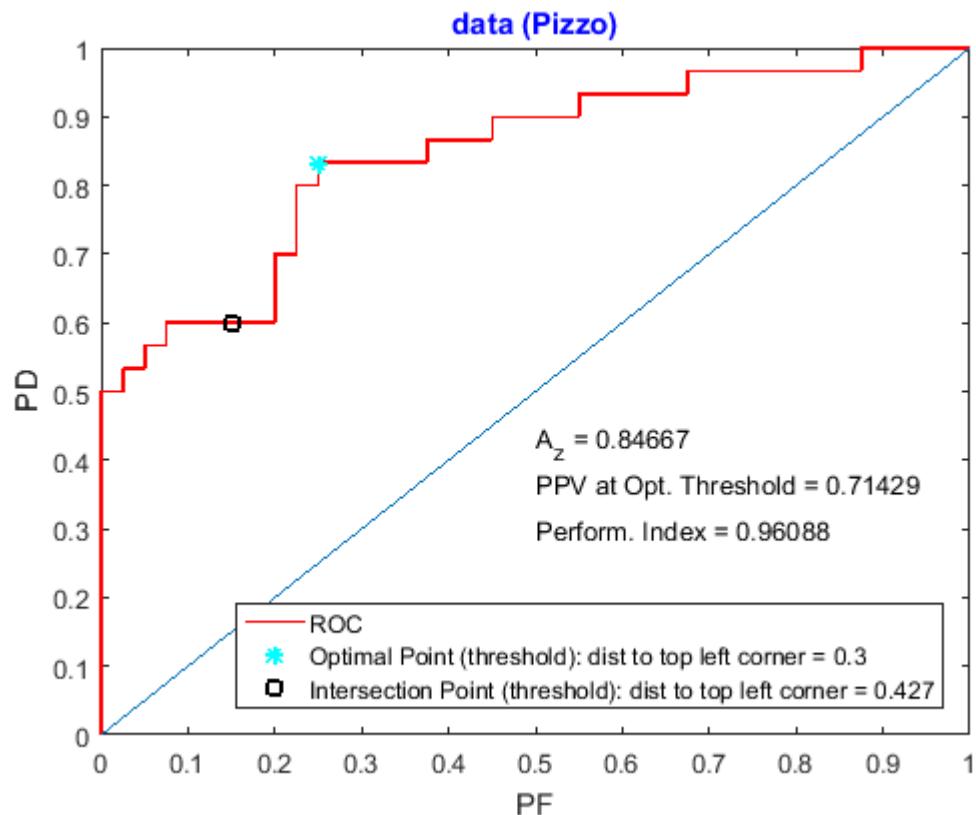
Transition Matrix: Threshold (intersection) = 4.275

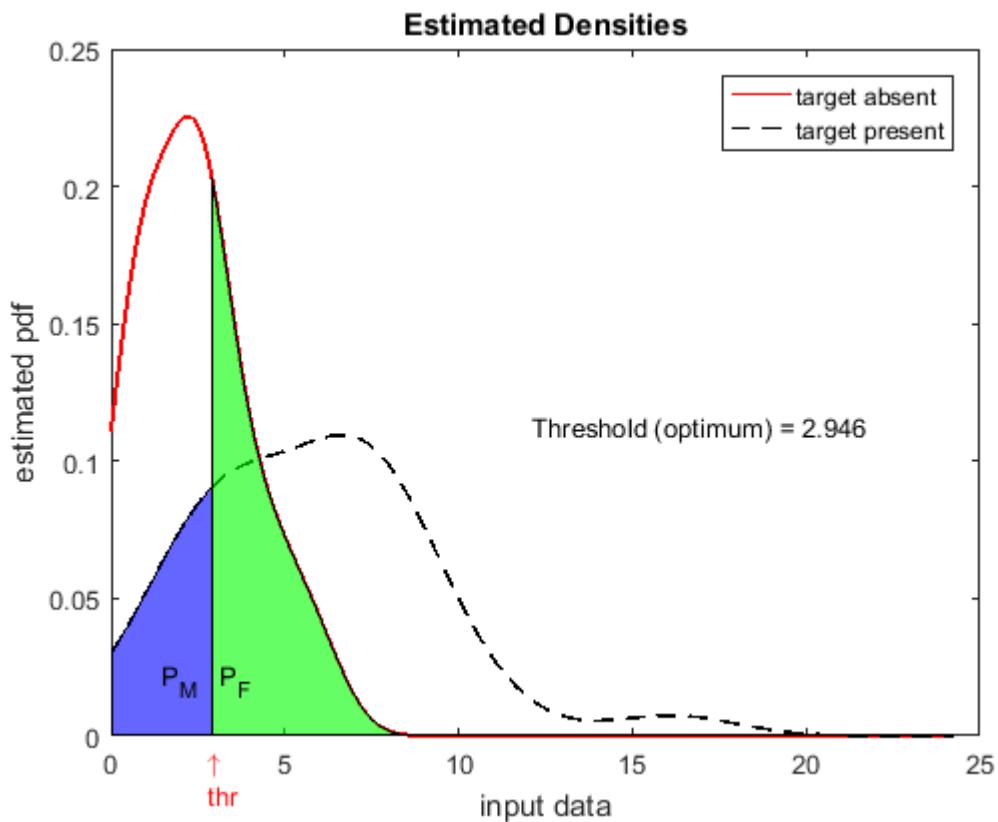
$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{17}{20} & \frac{2}{5} \\ \frac{3}{20} & \frac{3}{5} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.85 & 0.4 \\ 0.15 & 0.6 \end{bmatrix}$$

$$P_F = \frac{3}{20} = 0.15 \quad P_M = \frac{2}{5} = 0.4 \quad \text{PPV} = \frac{3}{4} = 0.75$$

p m shankar





Confusion Matrix : Threshold (optimum) = 2.946

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	10	30
	Target Present	25	5
	Total Counts	35	35

dist to top left corner of the ROC curve = 0.3

Transition Matrix: Threshold (optimum) = 2.946

$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{3}{4} & \frac{1}{6} \\ \frac{1}{4} & \frac{5}{6} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.75 & 0.1667 \\ 0.25 & 0.8333 \end{bmatrix}$$

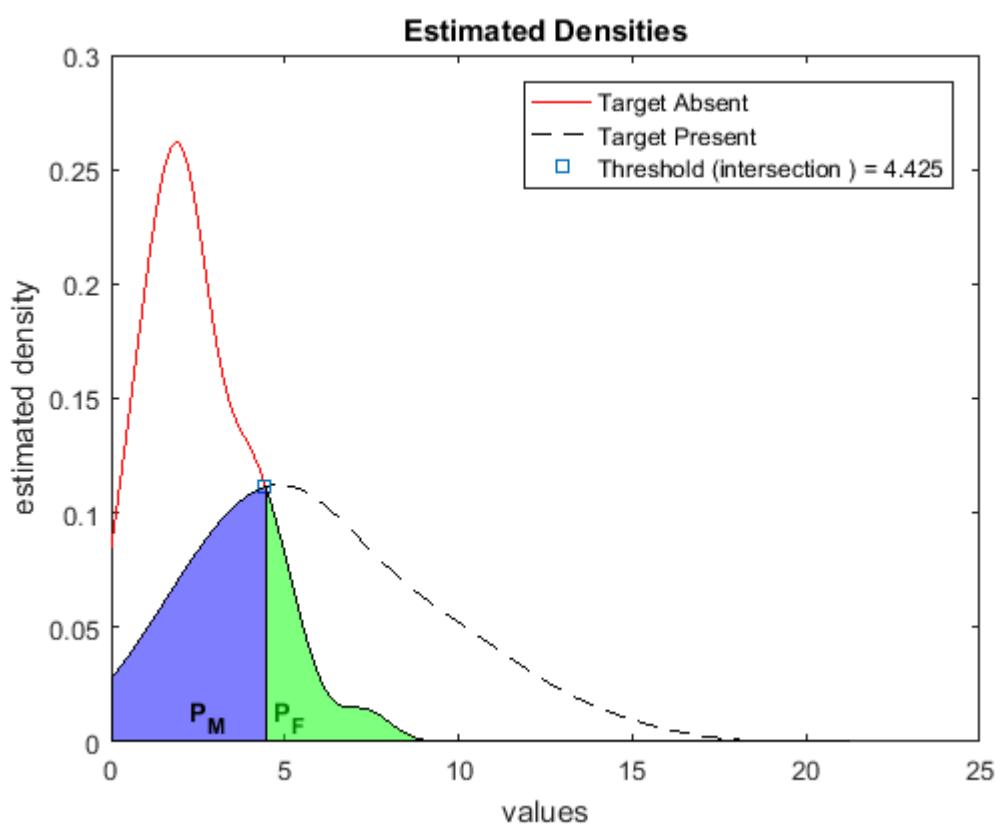
$$P_F = \frac{1}{4} = 0.25 \quad P_M = \frac{1}{6} = 0.16667 \quad \text{PPV} = \frac{5}{7} = 0.71429$$

p m shankar

data (Purcell)

Target Absent					Target Present				
1.93	0.12	4.31	4.819	2.662	8.247	4.686	1.923	11.923	10.172
4.872	3.934	1.217	1.819	1.643	4.735	7.855	4.315	5.474	6.467
3.643	3.742	3.798	0.394	3.981	2.266	4.557	1.079	6.416	2.508
3.717	0.275	2.067	1.821	1.263	3.001	6.27	5.503	9.111	8.734
2.196	1.349	2.36	2.645	0.334	14.18	10.886	2.092	6.301	10.251
1.276	2.678	1.619	0.806	2.05	4.323	6.228	3.059	4.316	4.381
2.294	1.711	2.23	4.904	2.44					
5.536	2.581	7.295	1.079	1.075					

(c) P. M. Shankar



Confusion Matrix: Threshold (intersection) = 4.425

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	5	35
	Target Present	19	11
	Total Counts	24	46

dist to top left corner of the ROC curve = 0.387

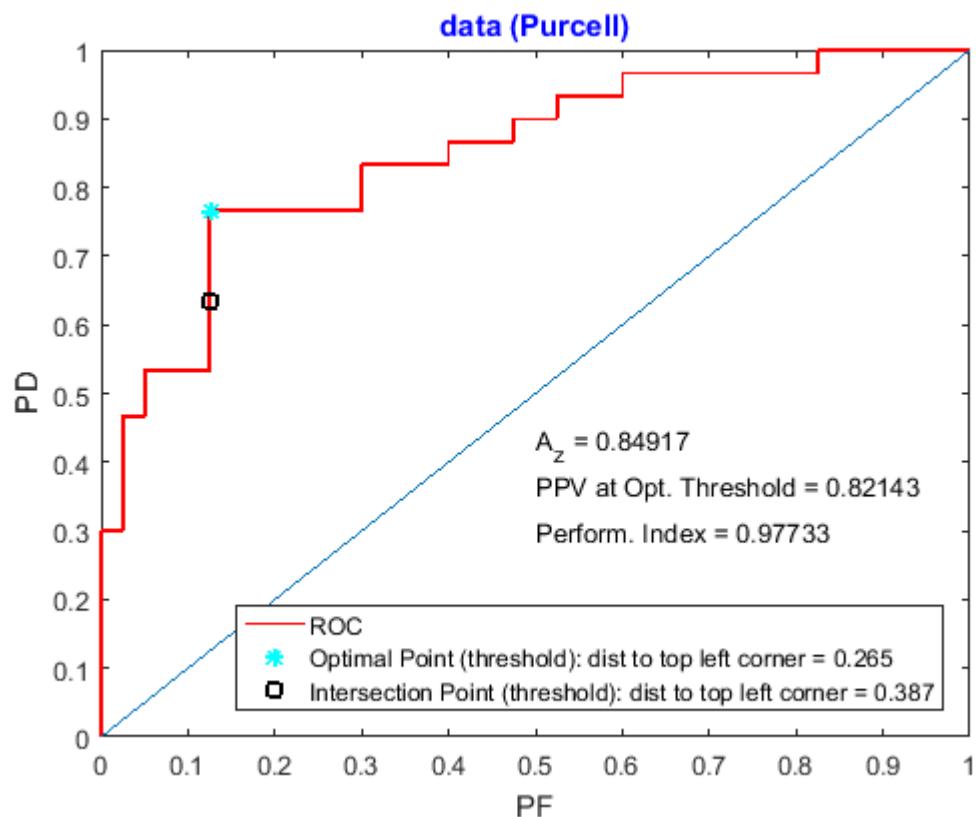
Transition Matrix: Threshold (intersection) = 4.425

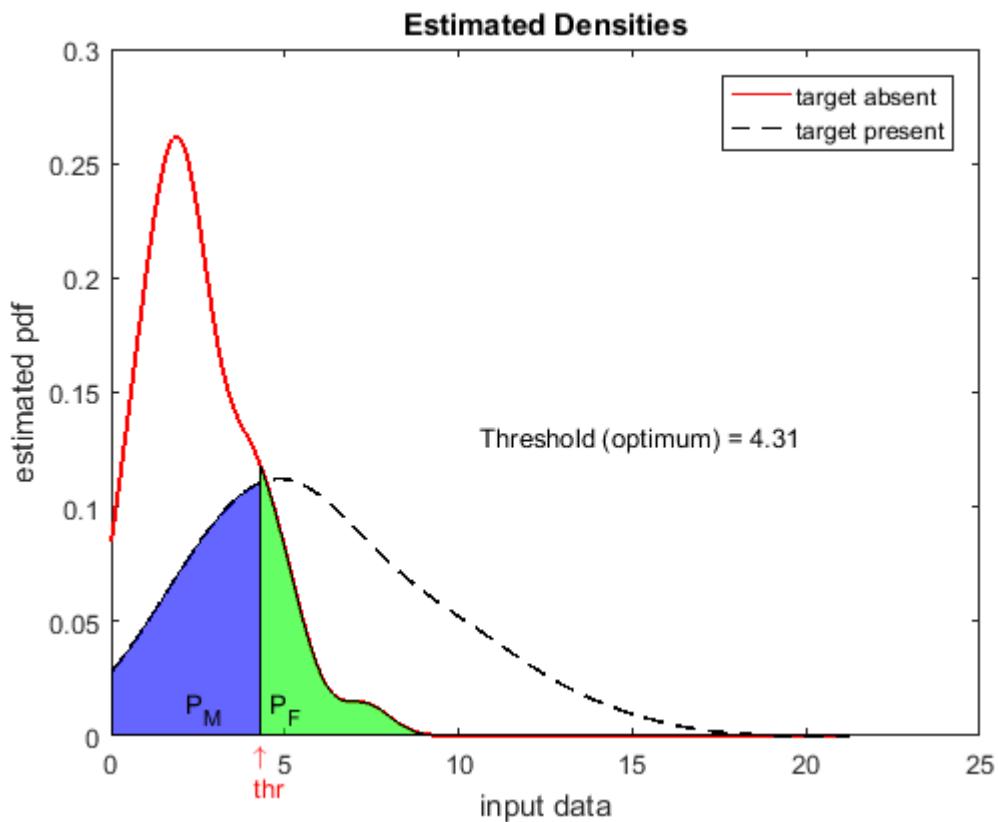
$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{7}{8} & \frac{11}{30} \\ \frac{1}{8} & \frac{19}{30} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.875 & 0.36667 \\ 0.125 & 0.6333 \end{bmatrix}$$

$$P_F = \frac{1}{8} = 0.125 \quad P_M = \frac{11}{30} = 0.36667 \quad \text{PPV} = \frac{19}{24} = 0.79167$$

p m shankar





Confusion Matrix : Threshold (optimum) = 4.31

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	5	35
	Target Present	23	7
	Total Counts	28	42

dist to top left corner of the ROC curve = 0.265

Transition Matrix: Threshold (optimum) = 4.31

$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{7}{8} & \frac{7}{30} \\ \frac{1}{8} & \frac{23}{30} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.875 & 0.2333 \\ 0.125 & 0.7667 \end{bmatrix}$$

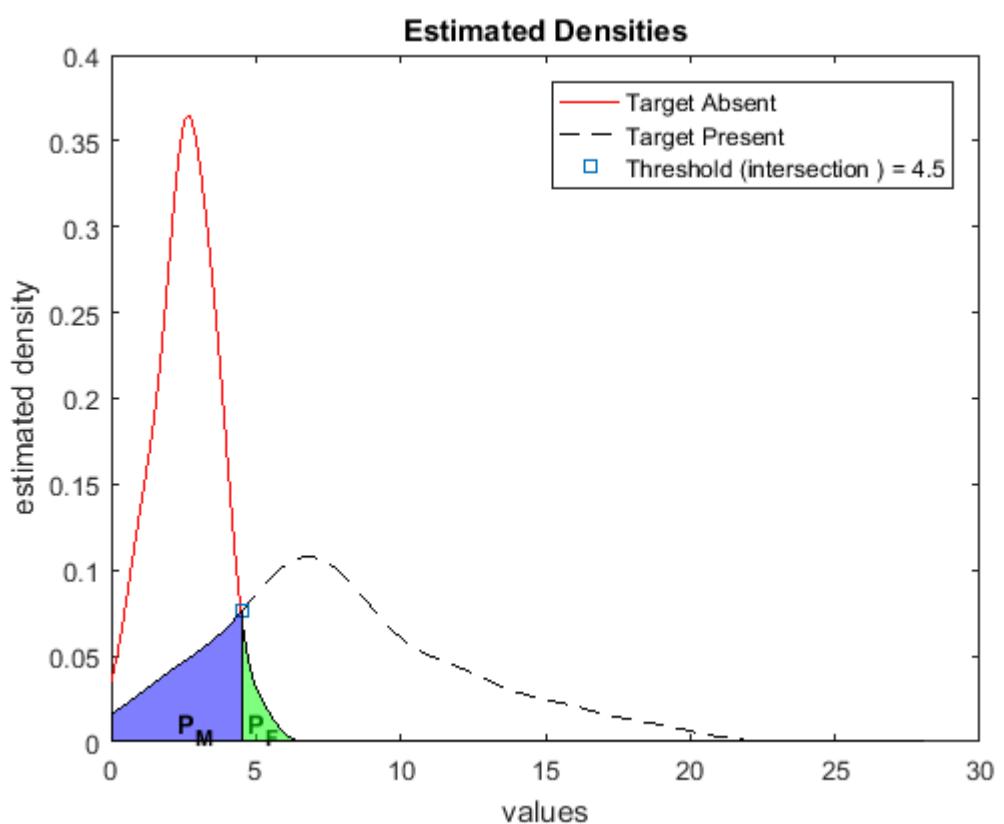
$$P_F = \frac{1}{8} = 0.125 \quad P_M = \frac{7}{30} = 0.2333 \quad \text{PPV} = \frac{23}{28} = 0.82143$$

p m shankar

data (Reed)

Target Absent					Target Present				
0.864	2.511	5.115	3.349	1.643	2.079	5.835	8.848	6.52	8.331
2.454	3.192	2.653	1.114	3.663	5.552	18.714	12.076	11.909	7.74
1.696	2.563	2.432	3.835	2.441	6.55	5.278	5.761	2.721	7.97
2.78	2.808	1.953	2.57	3.011	4.795	11.058	0.708	15.359	7.705
2.571	3.408	2.013	3.572	1.853	7.116	15.706	5.79	3.304	9.13
3.033	2.545	3.829	1.854	3.659	11.125	8.559	6.652	2.782	13.327
0.139	4.225	2.555	2.796	0.932					
3.588	1.158	3.621	0.997	2.373					

(c) P. M. Shankar



Confusion Matrix: Threshold (intersection) = 4.5

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	1	39
	Target Present	25	5
	Total Counts	26	44

dist to top left corner of the ROC curve = 0.169

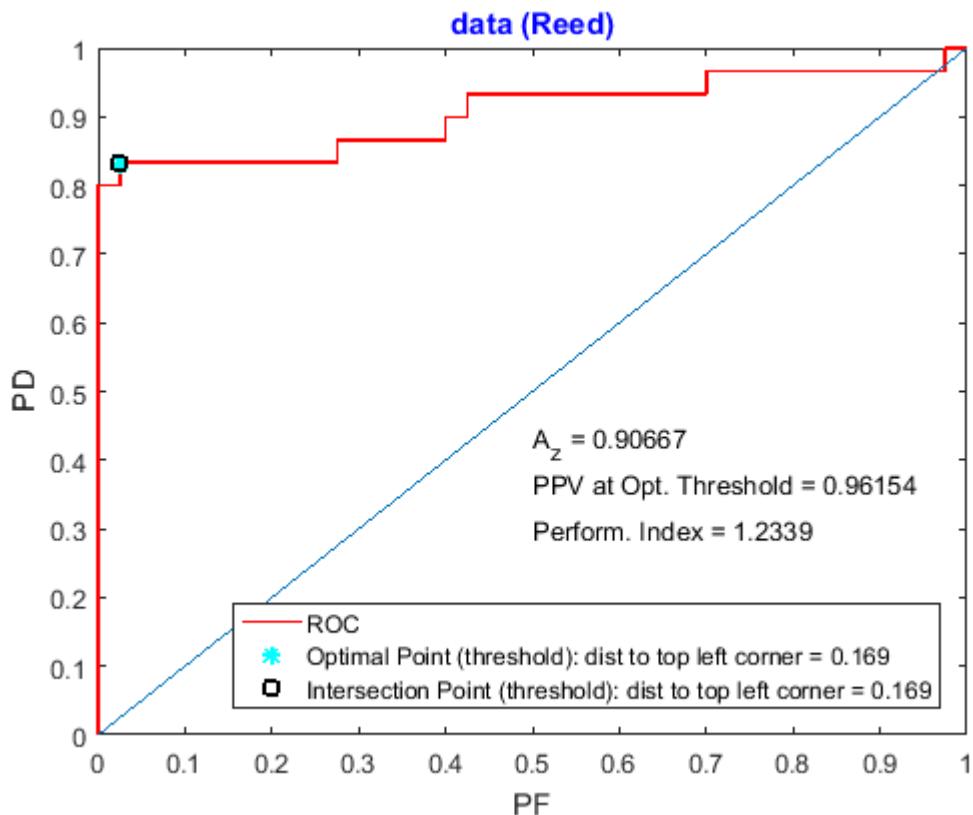
Transition Matrix: Threshold (intersection) = 4.5

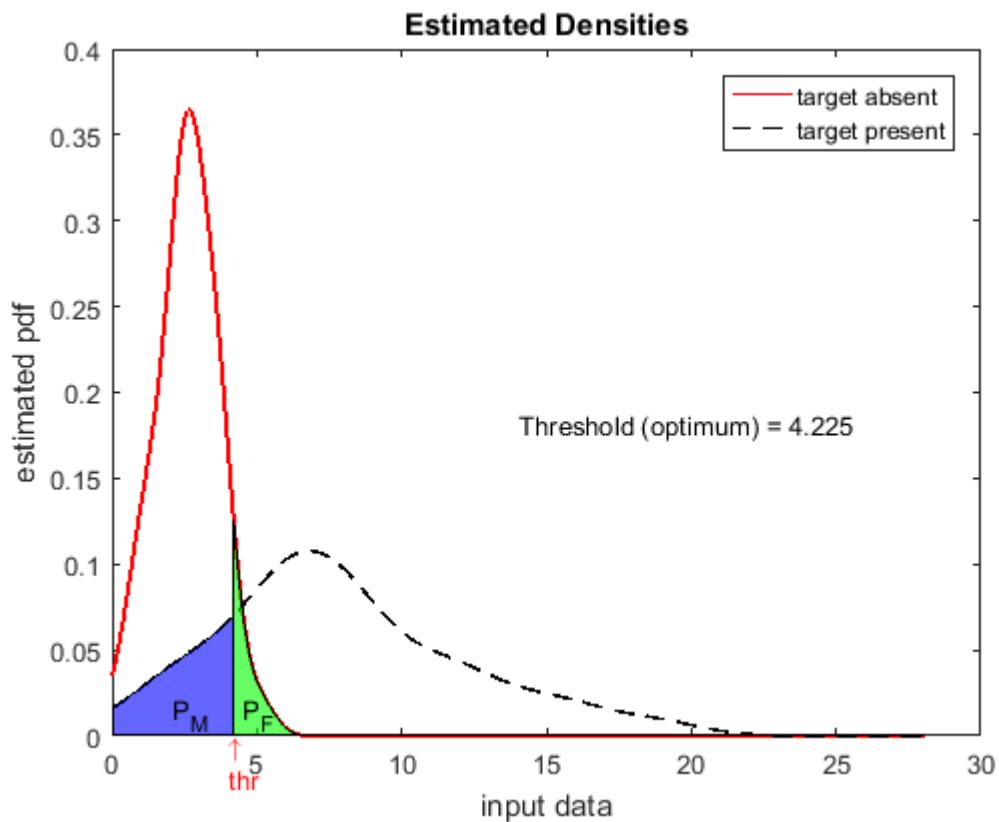
$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{39}{40} & \frac{1}{6} \\ \frac{1}{40} & \frac{5}{6} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.975 & 0.16667 \\ 0.025 & 0.8333 \end{bmatrix}$$

$$P_F = \frac{1}{40} = 0.025 \quad P_M = \frac{1}{6} = 0.16667 \quad \text{PPV} = \frac{25}{26} = 0.96154$$

p m shankar





Confusion Matrix : Threshold (optimum) = 4.225

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	1	39
	Target Present	25	5
	Total Counts	26	44

dist to top left corner of the ROC curve = 0.169

Transition Matrix: Threshold (optimum) = 4.225

$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{39}{40} & \frac{1}{6} \\ \frac{1}{40} & \frac{5}{6} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.975 & 0.1667 \\ 0.025 & 0.8333 \end{bmatrix}$$

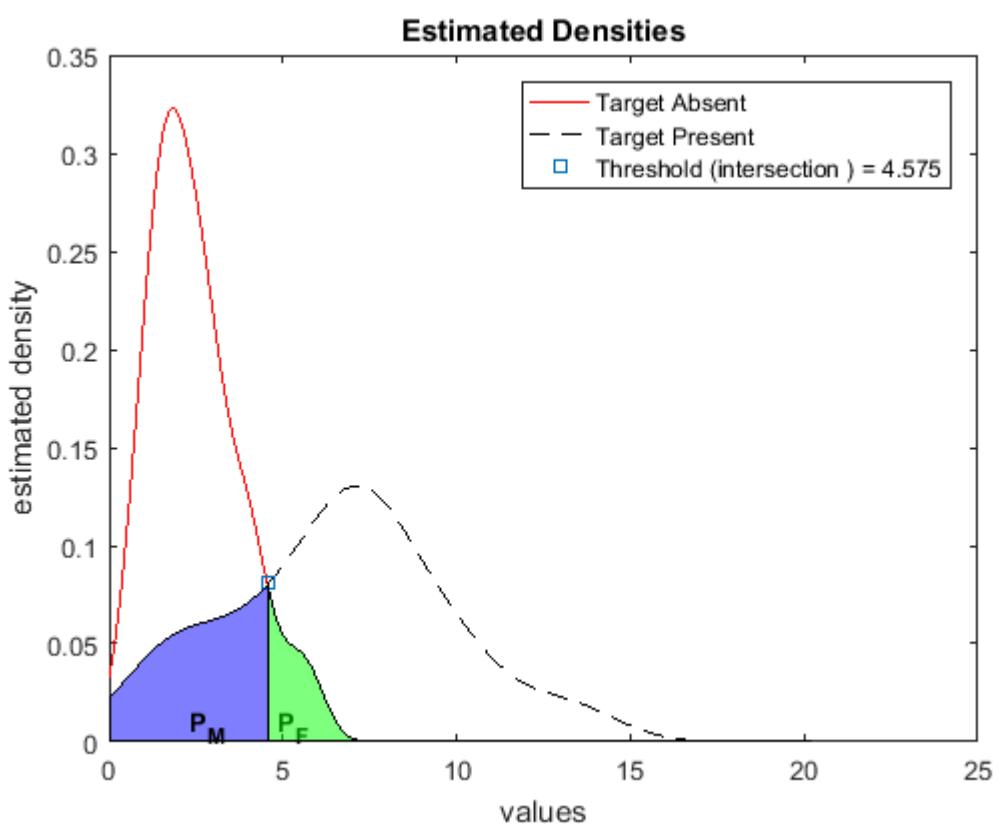
$$P_F = \frac{1}{40} = 0.025 \quad P_M = \frac{1}{6} = 0.16667 \quad \text{PPV} = \frac{25}{26} = 0.96154$$

p m shankar

data (Rouf)

Target Absent					Target Present				
1.029	2.033	4.814	2.348	2.747	3.561	9.758	1.476	2.133	6.962
2.341	1.881	0.738	2.309	2.929	5.127	5.804	7.299	9.947	6.324
0.883	1.901	3.843	2.618	1.526	1.043	8.612	7.549	6.45	6.692
1.917	1.77	1.421	5.64	2.826	5.086	10.285	4.269	2.425	7.468
2.263	2.96	3.522	1.569	3.1	13.469	8.25	7.848	7.616	7.682
1.301	2.676	1.276	3.912	0.627	10.269	4.453	6.763	12.85	1.858
4.258	1.171	2.932	1.382	3.953					
4.036	1.807	1.58	5.656	1.781					

(c) P. M. Shankar



Confusion Matrix: Threshold (intersection) = 4.575

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	3	37
	Target Present	22	8
	Total Counts	25	45

dist to top left corner of the ROC curve = 0.277

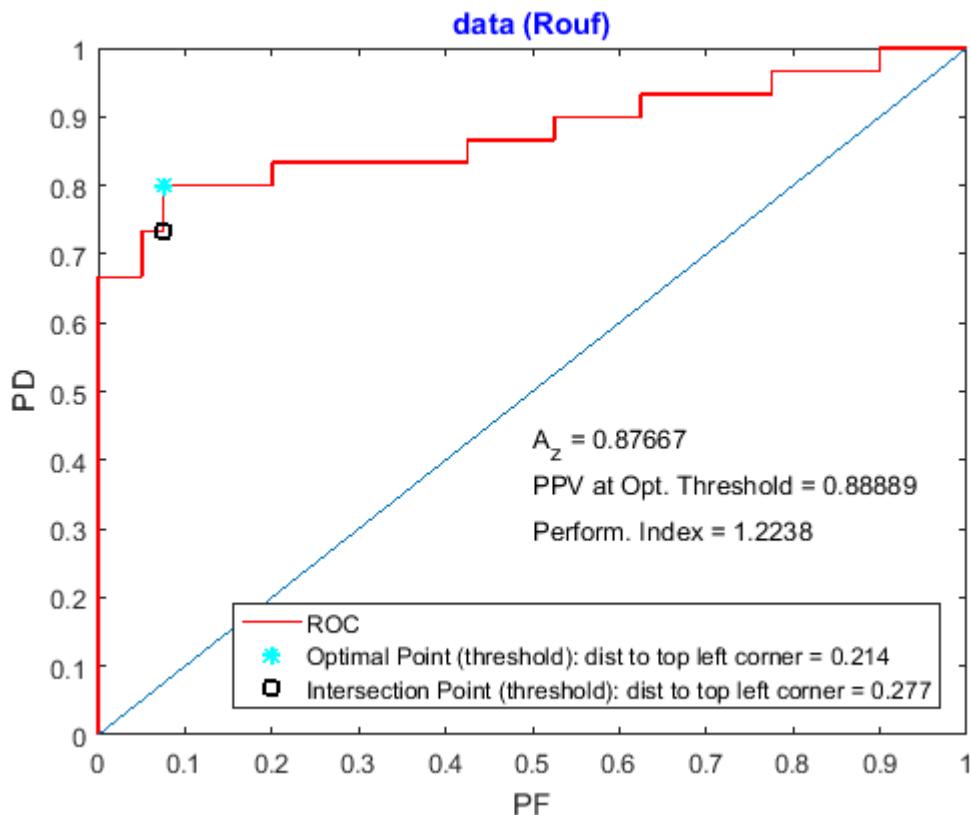
Transition Matrix: Threshold (intersection) = 4.575

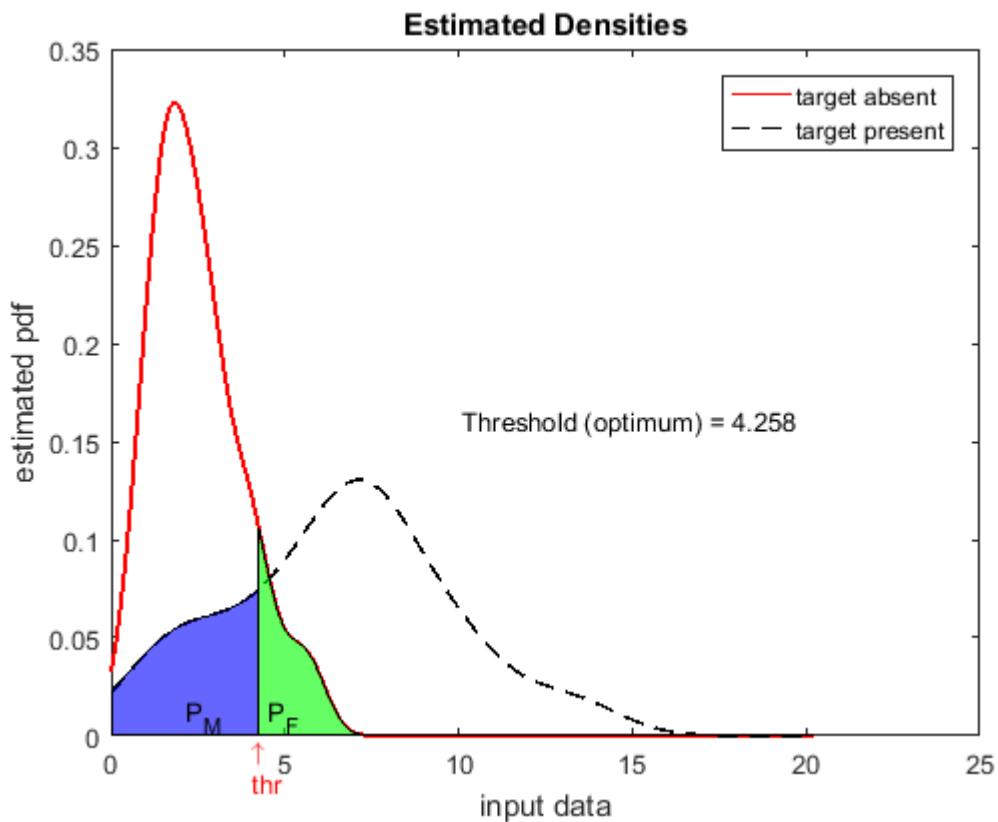
$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{37}{40} & \frac{4}{15} \\ \frac{3}{40} & \frac{11}{15} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.925 & 0.26667 \\ 0.075 & 0.7333 \end{bmatrix}$$

$$P_F = \frac{3}{40} = 0.075 \quad P_M = \frac{4}{15} = 0.26667 \quad \text{PPV} = \frac{22}{25} = 0.88$$

p m shankar





Confusion Matrix : Threshold (optimum) = 4.258

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	3	37
	Target Present	24	6
	Total Counts	27	43

dist to top left corner of the ROC curve = 0.214

Transition Matrix: Threshold (optimum) = 4.258

$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{37}{40} & \frac{1}{5} \\ \frac{3}{40} & \frac{4}{5} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.925 & 0.2 \\ 0.075 & 0.8 \end{bmatrix}$$

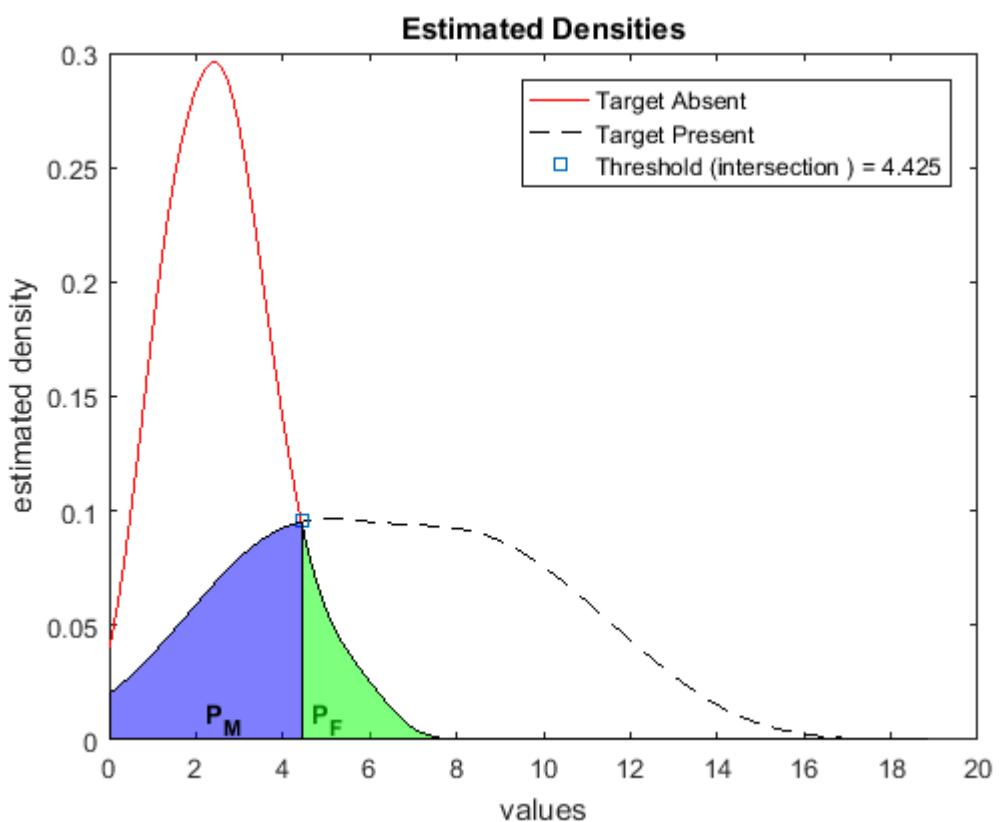
$$P_F = \frac{3}{40} = 0.075 \quad P_M = \frac{1}{5} = 0.2 \quad \text{PPV} = \frac{8}{9} = 0.88889$$

p m shankar

data (Saleh)

Target Absent					Target Present				
0.504	2.243	3.432	2.29	2.752	12.573	9.655	5.804	9.327	2.809
2.604	1.418	2.655	4.693	1.44	11.701	3.09	8.418	11.213	6.982
2.659	1.158	4.22	1.158	2.571	7.979	7.499	8.912	4.481	4.379
2.816	1.248	1.51	1.099	2.124	4.795	10.114	2.719	6.609	8.045
5.229	3.743	3.69	1.542	2.687	4.09	8.45	10.948	4.438	4.485
2.682	3.261	2.71	1.542	1.953	1.922	8.007	4.754	4.062	1.426
3.094	1.573	2.46	4.037	3.293					
1.839	2.663	3.73	1.021	5.947					

(c) P. M. Shankar



Confusion Matrix: Threshold (intersection) = 4.425

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	3	37
	Target Present	22	8
	Total Counts	25	45

dist to top left corner of the ROC curve = 0.277

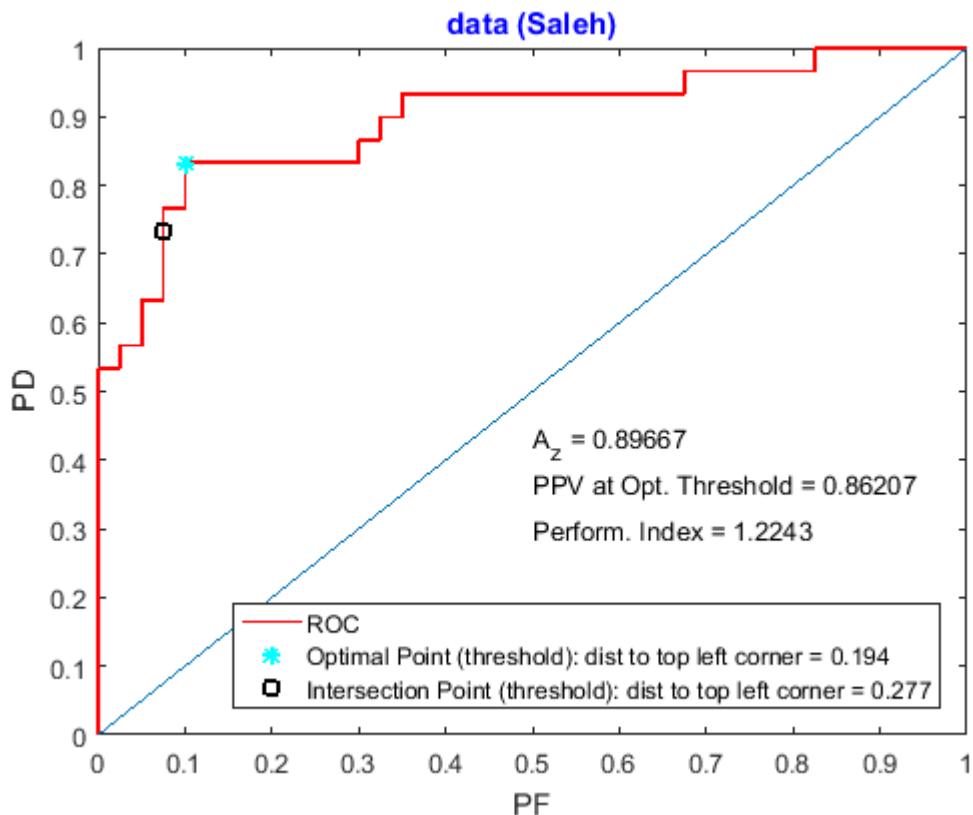
Transition Matrix: Threshold (intersection) = 4.425

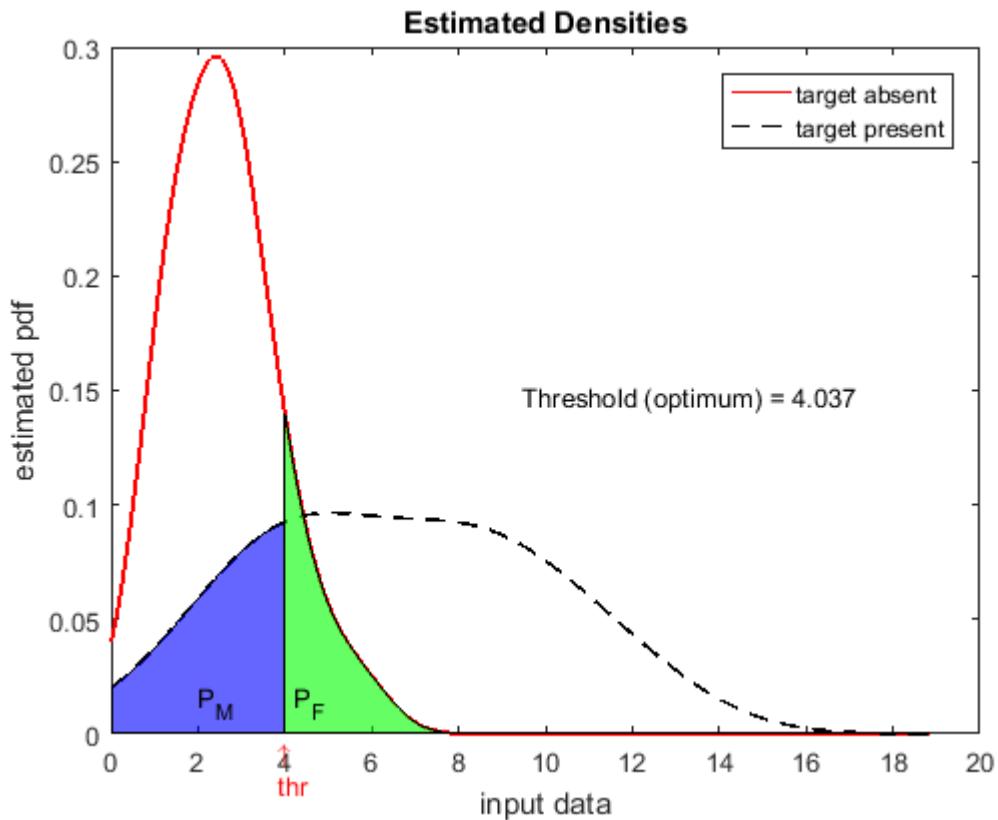
$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{37}{40} & \frac{4}{15} \\ \frac{3}{40} & \frac{11}{15} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.925 & 0.26667 \\ 0.075 & 0.7333 \end{bmatrix}$$

$$P_F = \frac{3}{40} = 0.075 \quad P_M = \frac{4}{15} = 0.26667 \quad \text{PPV} = \frac{22}{25} = 0.88$$

p m shankar





Confusion Matrix : Threshold (optimum) = 4.037

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	4	36
	Target Present	25	5
	Total Counts	29	41

dist to top left corner of the ROC curve = 0.194

Transition Matrix: Threshold (optimum) = 4.037

$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{9}{10} & \frac{1}{6} \\ \frac{1}{10} & \frac{5}{6} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.9 & 0.1667 \\ 0.1 & 0.8333 \end{bmatrix}$$

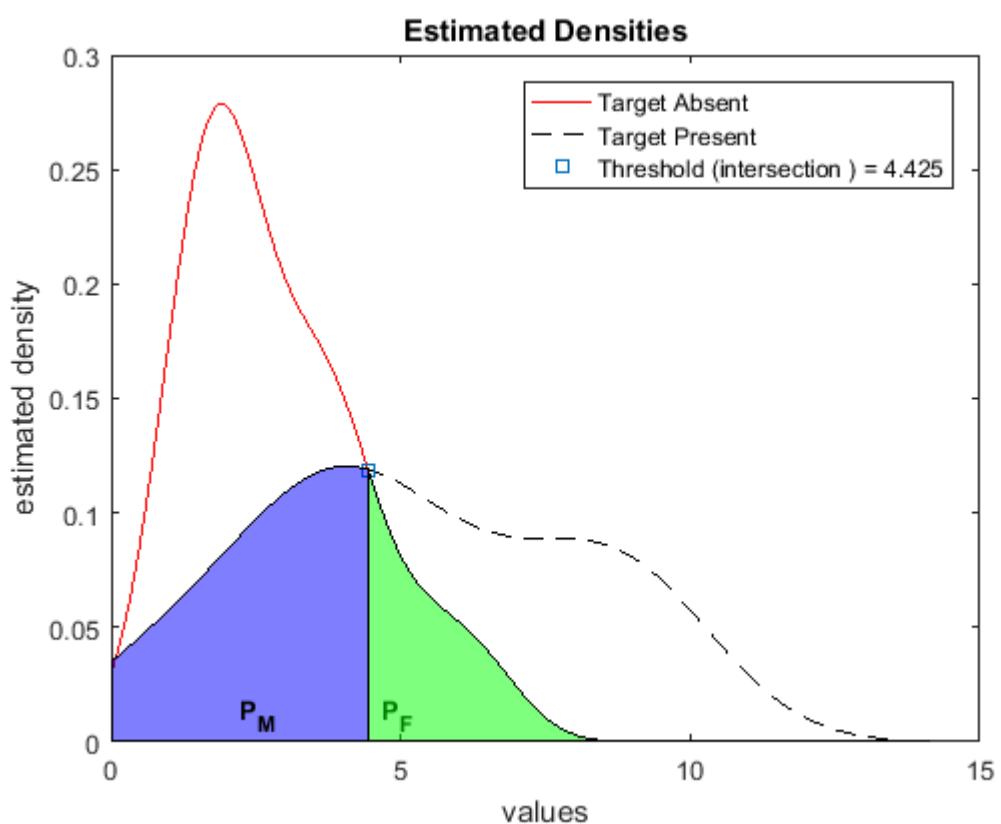
$$P_F = \frac{1}{10} = 0.1 \quad P_M = \frac{1}{6} = 0.16667 \quad \text{PPV} = \frac{25}{29} = 0.86207$$

p m shankar

data (Sanford)

Target Absent					Target Present				
1.661	6.662	2.681	4.133	2.893	9.08	4.399	1.951	6.522	7.806
3.695	5.151	3.556	1.1	1.524	4.248	8.139	3.616	0.674	0.604
2.19	6.199	2.724	3.649	1.226	6.336	0.931	5.378	3.68	4.569
1.083	1.752	1.982	3.841	1.48	8.908	2.356	6.046	4.045	4.082
1.615	4.208	3.556	5.188	1.881	3.442	3.455	6.029	2.828	9.098
1.873	1.869	2.927	2.162	0.974	9.447	8.374	8.726	9.367	3.985
1.283	1.809	3.395	5.768	1.899					
4.328	3.922	2.34	1.888	2.408					

(c) P. M. Shankar



Confusion Matrix: Threshold (intersection) = 4.425

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	5	35
	Target Present	15	15
	Total Counts	20	50

dist to top left corner of the ROC curve = 0.515

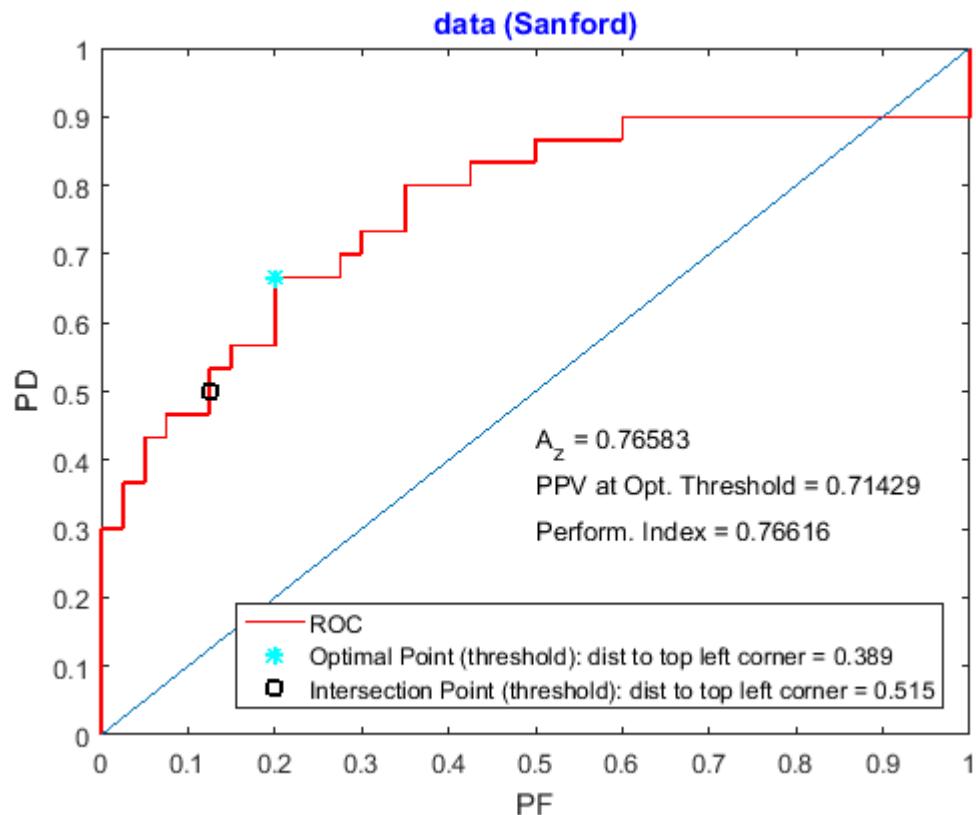
Transition Matrix: Threshold (intersection) = 4.425

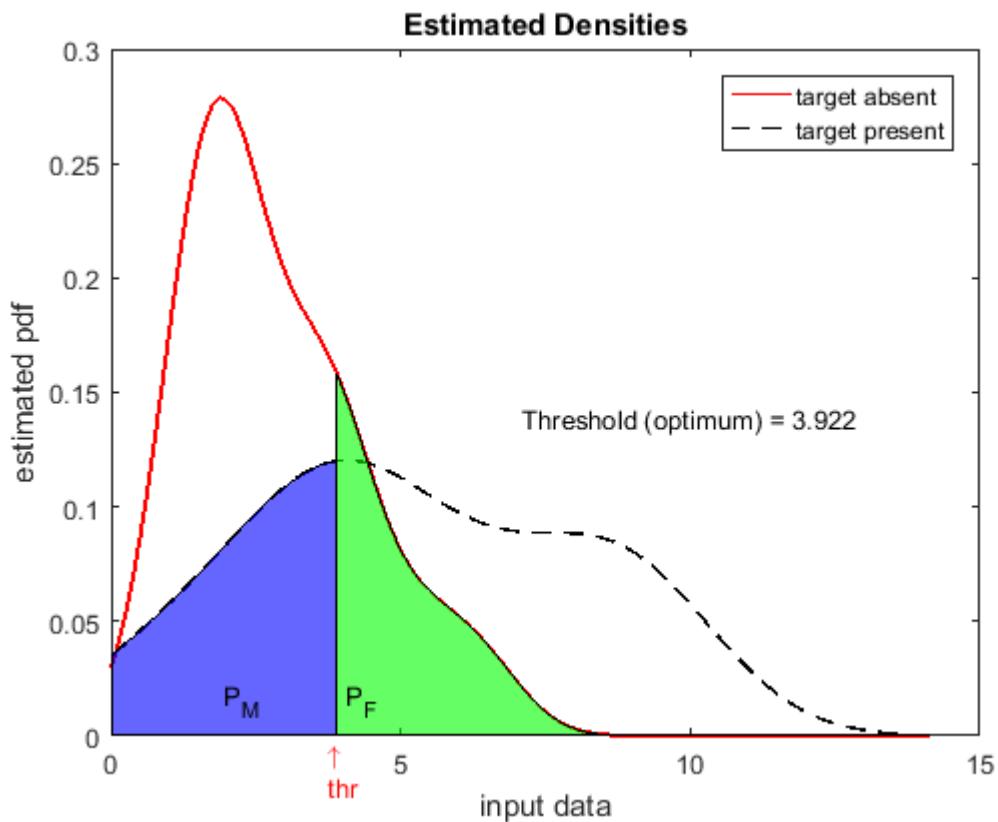
$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{7}{8} & \frac{1}{2} \\ \frac{1}{8} & \frac{1}{2} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.875 & 0.5 \\ 0.125 & 0.5 \end{bmatrix}$$

$$P_F = \frac{1}{8} = 0.125 \quad P_M = \frac{1}{2} = 0.5 \quad \text{PPV} = \frac{3}{4} = 0.75$$

p m shankar





Confusion Matrix : Threshold (optimum) = 3.922

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	8	32
	Target Present	20	10
	Total Counts	28	42

dist to top left corner of the ROC curve = 0.389

Transition Matrix: Threshold (optimum) = 3.922

$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{4}{5} & \frac{1}{3} \\ \frac{1}{5} & \frac{2}{3} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.8 & 0.3333 \\ 0.2 & 0.6667 \end{bmatrix}$$

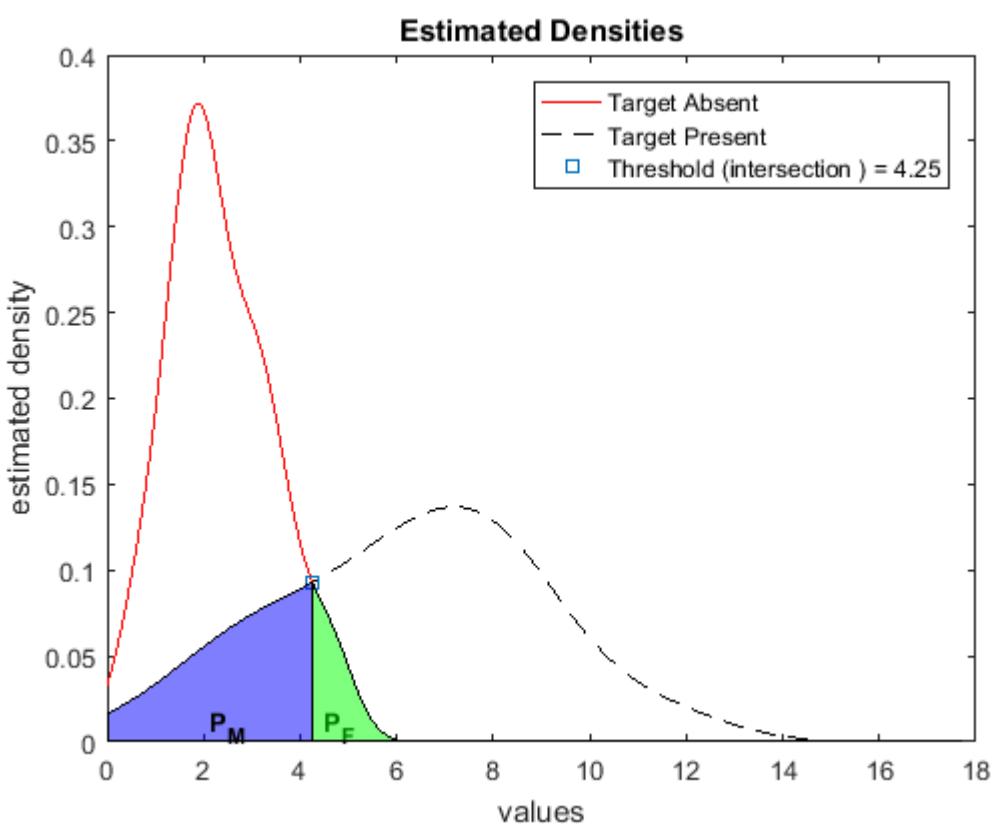
$$P_F = \frac{1}{5} = 0.2 \quad P_M = \frac{1}{3} = 0.3333 \quad \text{PPV} = \frac{5}{7} = 0.71429$$

p m shankar

data (Shahriar)

Target Absent					Target Present				
1.646	1.403	1.926	1.711	3.59	0.767	6.985	6.963	5.654	10.806
3.211	4.438	1.741	3.703	0.722	6.323	8.516	11.815	5.386	3.288
1.84	4.63	1.654	2.064	2.338	2.421	6.179	8.508	8.018	2.039
2.82	1.848	2.138	4.664	1.389	7.692	7.958	6.127	7.57	4.821
1.476	0.86	1.793	2.095	3.171	3.573	4.761	6.698	8.686	9.499
0.562	0.685	3.148	2.932	1.727	4.896	3.43	7.688	2.699	8.698
2.08	3.24	3.058	3.188	2.767					
2.453	1.418	3.76	1.967	2.223					

(c) P. M. Shankar



Confusion Matrix: Threshold (intersection) = 4.25

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	3	37
	Target Present	23	7
	Total Counts	26	44

dist to top left corner of the ROC curve = 0.245

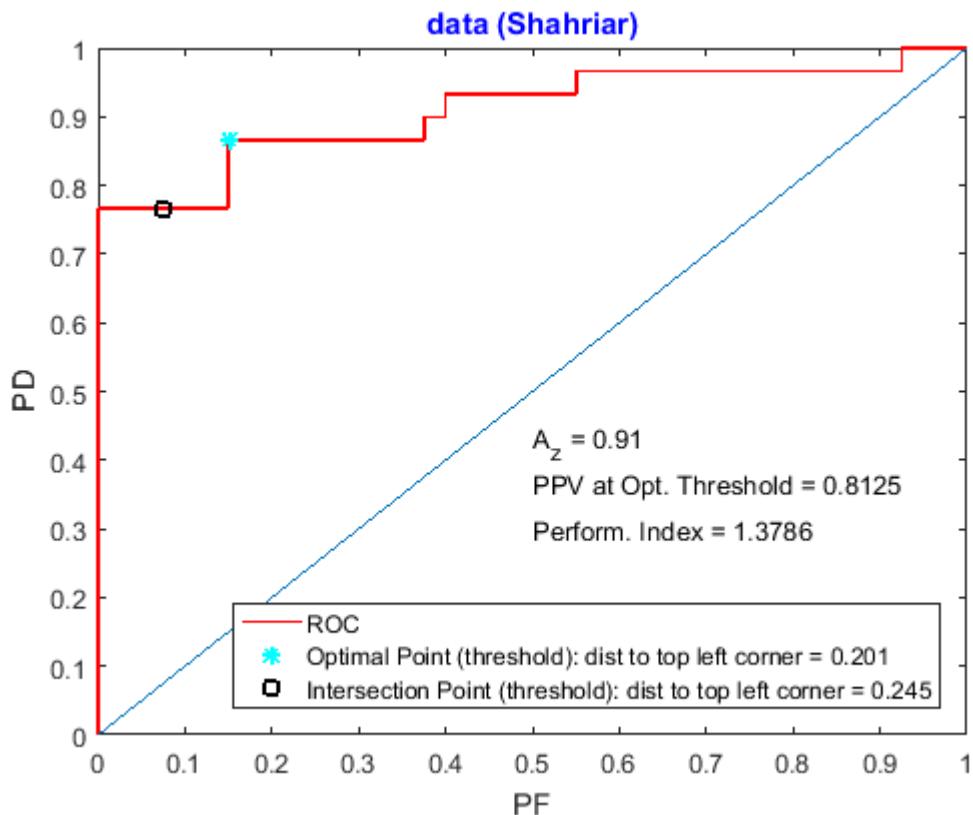
Transition Matrix: Threshold (intersection) = 4.25

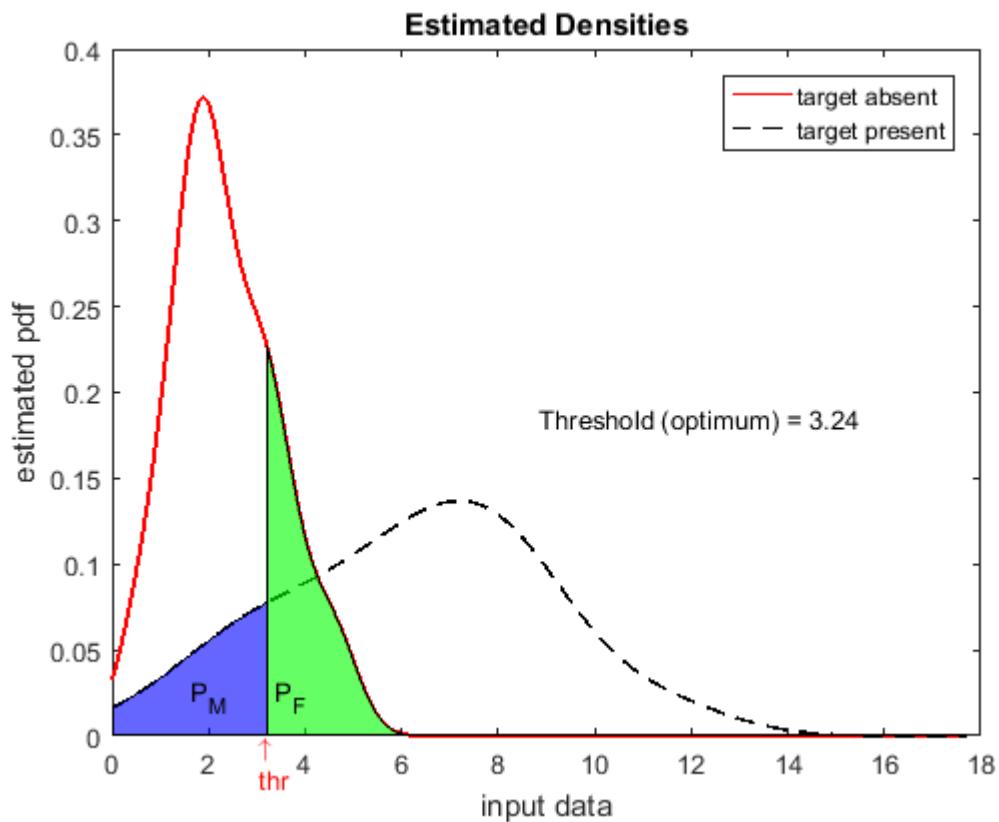
$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{37}{40} & \frac{7}{30} \\ \frac{3}{40} & \frac{23}{30} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.925 & 0.2333 \\ 0.075 & 0.7667 \end{bmatrix}$$

$$P_F = \frac{3}{40} = 0.075 \quad P_M = \frac{7}{30} = 0.23333 \quad \text{PPV} = \frac{23}{26} = 0.88462$$

p m shankar





Confusion Matrix : Threshold (optimum) = 3.24

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	6	34
	Target Present	26	4
	Total Counts	32	38

dist to top left corner of the ROC curve = 0.201

Transition Matrix: Threshold (optimum) = 3.24

$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{17}{20} & \frac{2}{15} \\ \frac{3}{20} & \frac{13}{15} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.85 & 0.1333 \\ 0.15 & 0.8667 \end{bmatrix}$$

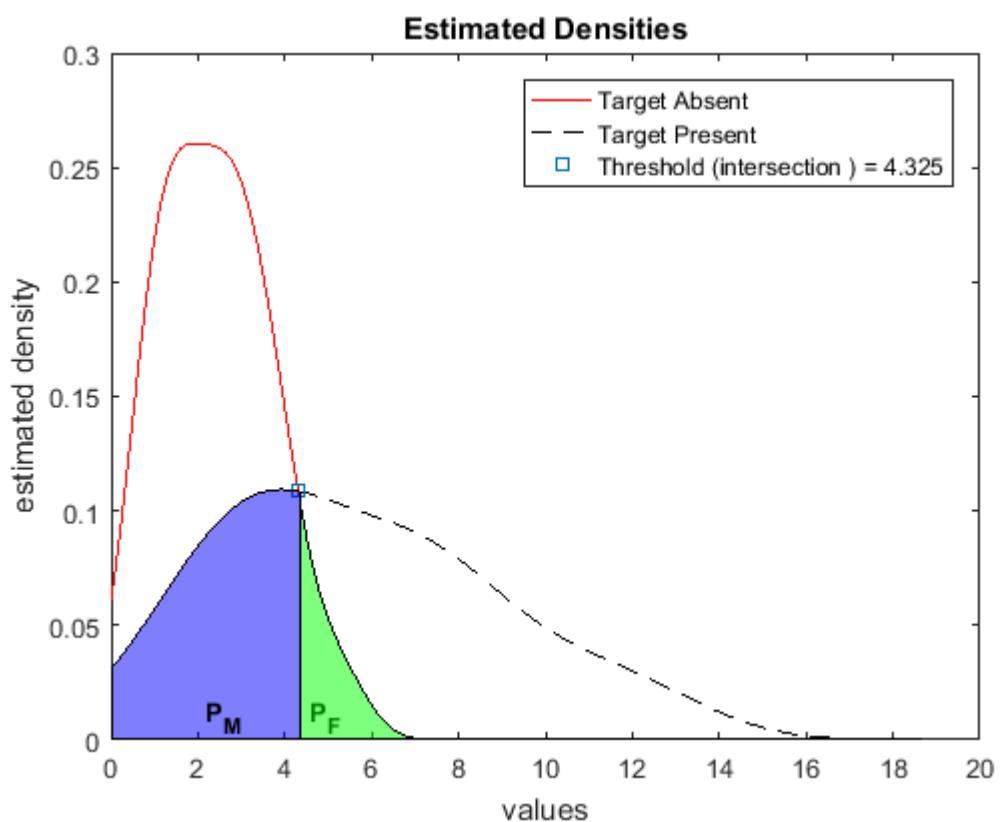
$$P_F = \frac{3}{20} = 0.15 \quad P_M = \frac{2}{15} = 0.1333 \quad \text{PPV} = \frac{13}{16} = 0.8125$$

p m shankar

data (Shetzline)

Target Absent					Target Present				
3.896	1.624	3.922	0.879	5.103	1.891	7.127	4.169	7.528	3.586
2.695	2.877	0.951	3.256	3.955	9.104	4.545	12.463	6.764	3.826
1.534	0.708	2.392	1.033	1.862	8.462	3.748	2.152	2.962	4.437
3.597	2.558	3.563	2.402	4.084	2.171	10.358	8.001	12.25	2.956
1.632	0.822	3.075	1.818	5.292	5.068	6.478	1.135	3.182	4.515
0.647	2.659	2.165	3.674	0.879	1.606	6.839	6.814	10.747	7.354
1.467	2.206	2.876	1.26	1.495					
1.645	1.015	2.958	2.908	2.913					

(c) P. M. Shankar



Confusion Matrix: Threshold (intersection) = 4.325

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	2	38
	Target Present	18	12
	Total Counts	20	50

dist to top left corner of the ROC curve = 0.403

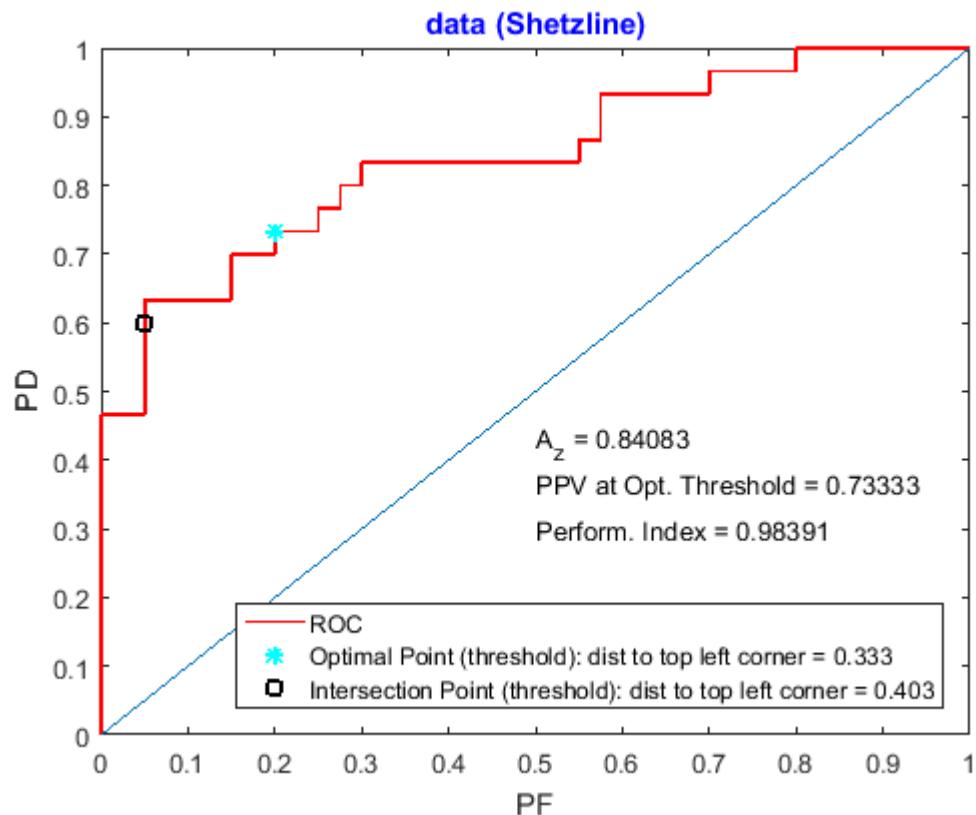
Transition Matrix: Threshold (intersection) = 4.325

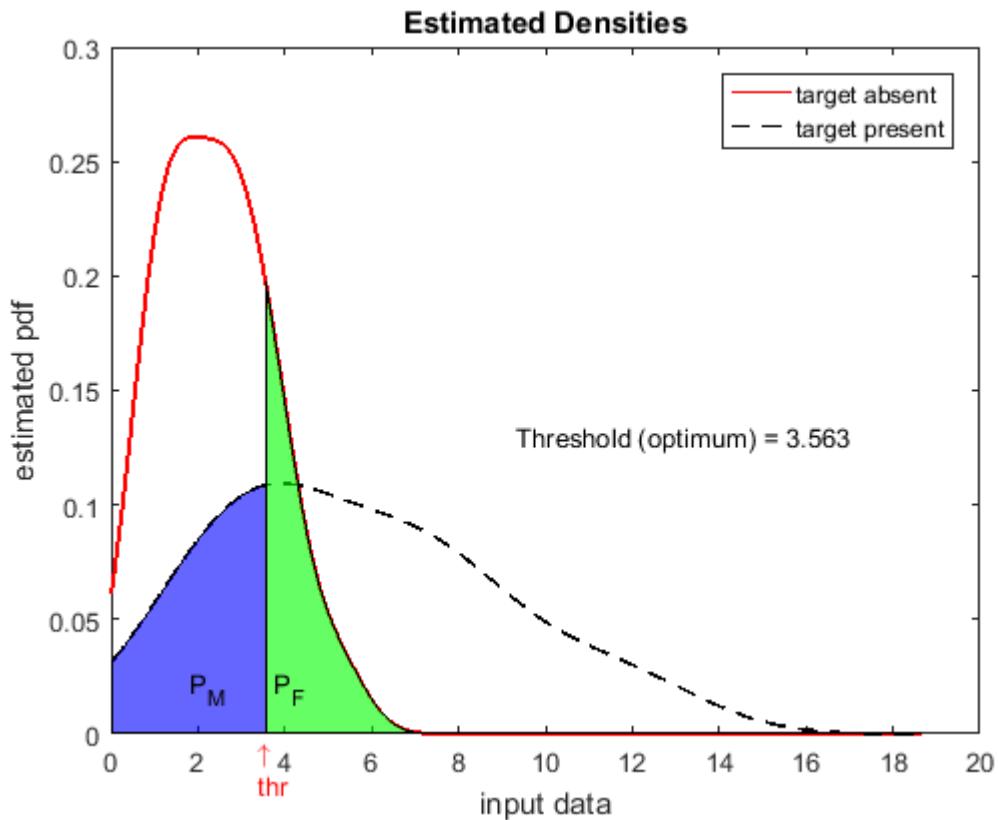
$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{19}{20} & \frac{2}{5} \\ \frac{1}{20} & \frac{3}{5} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.95 & 0.4 \\ 0.05 & 0.6 \end{bmatrix}$$

$$P_F = \frac{1}{20} = 0.05 \quad P_M = \frac{2}{5} = 0.4 \quad \text{PPV} = \frac{9}{10} = 0.9$$

p m shankar





Confusion Matrix : Threshold (optimum) = 3.563

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	8	32
	Target Present	22	8
	Total Counts	30	40

dist to top left corner of the ROC curve = 0.333

Transition Matrix: Threshold (optimum) = 3.563

$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{4}{5} & \frac{4}{15} \\ \frac{1}{5} & \frac{11}{15} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.8 & 0.2667 \\ 0.2 & 0.7333 \end{bmatrix}$$

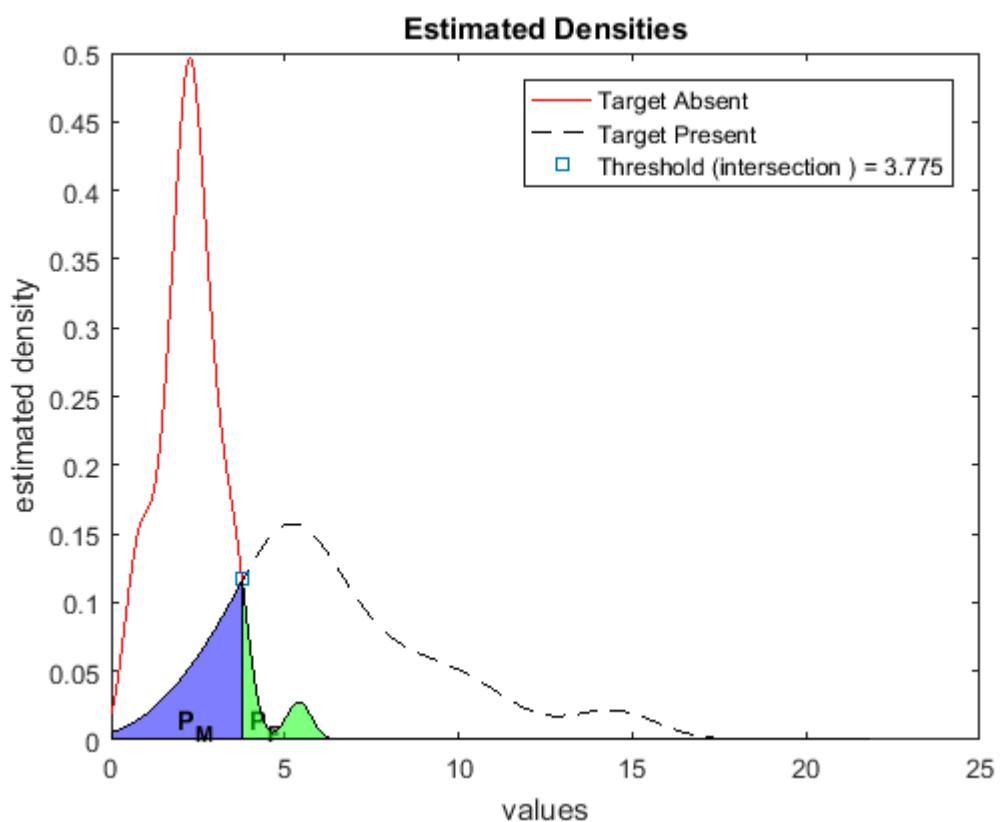
$$P_F = \frac{1}{5} = 0.2 \quad P_M = \frac{4}{15} = 0.26667 \quad \text{PPV} = \frac{11}{15} = 0.73333$$

p m shankar

data (Singer)

Target Absent					Target Present				
2.756	2.441	2.602	2.395	3.038	7.302	6.004	3.391	4.647	5.418
1.713	2.228	3.524	2.923	2.565	10.764	5.826	9.387	4.557	3.016
2.902	2.079	3.784	2.204	3.226	5.584	9.072	4.085	5.342	6.365
5.401	3.009	2.505	0.859	1.856	14.57	4.216	8.174	4.744	14.254
2.387	1.258	0.675	2.33	2.314	7.457	11.142	4.988	5.426	5.723
1.798	2.031	0.803	2.098	3.543	1.942	2.614	7.214	9.655	4.906
1.404	1.797	0.534	2.375	1.538					
0.935	3.612	2.175	1.925	2.245					

(c) P. M. Shankar



Confusion Matrix: Threshold (intersection) = 3.775

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	2	38
	Target Present	26	4
	Total Counts	28	42

dist to top left corner of the ROC curve = 0.142

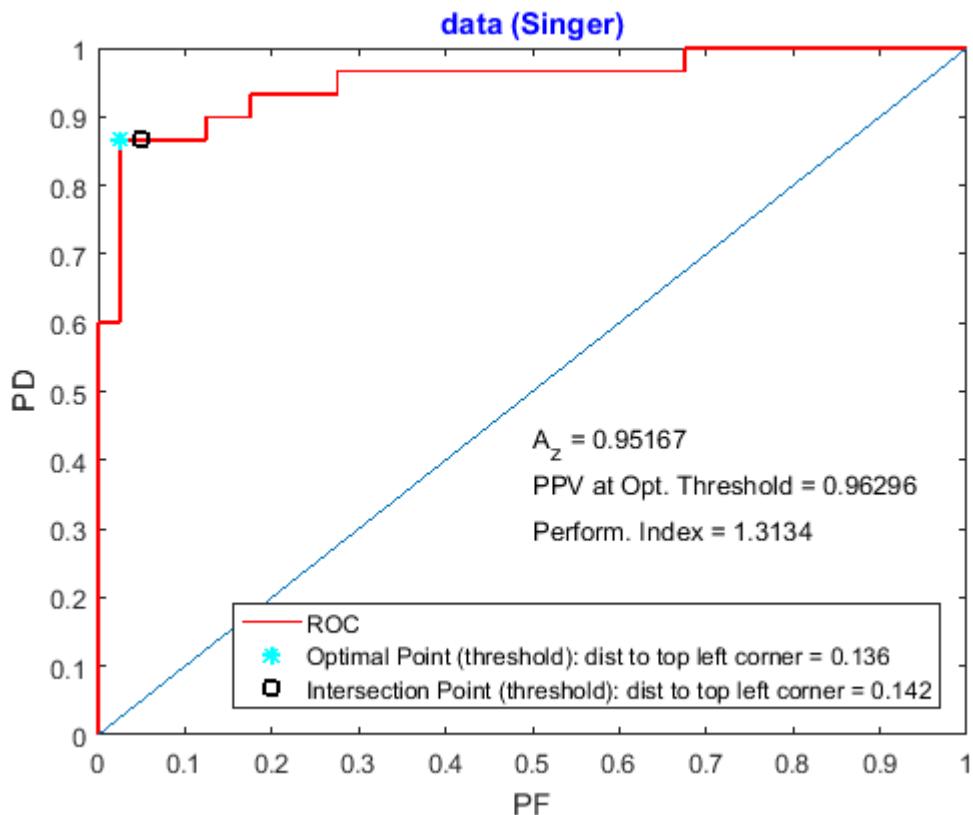
Transition Matrix: Threshold (intersection) = 3.775

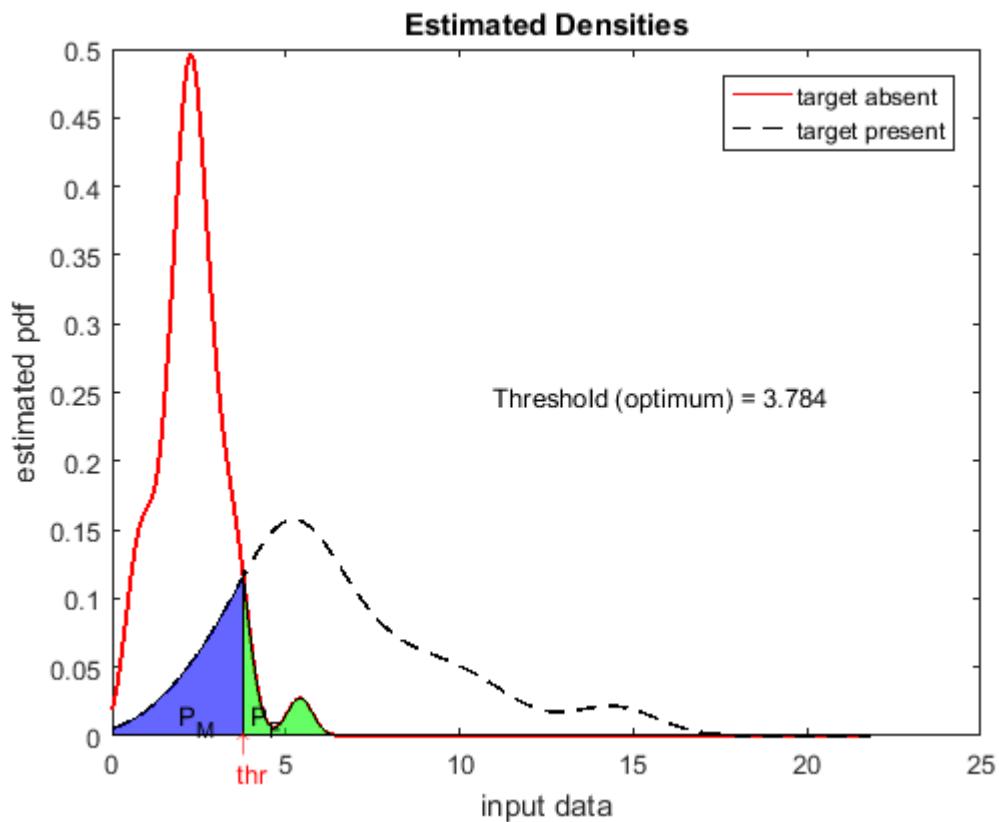
$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{19}{20} & \frac{2}{15} \\ \frac{1}{20} & \frac{13}{15} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.95 & 0.1333 \\ 0.05 & 0.8667 \end{bmatrix}$$

$$P_F = \frac{1}{20} = 0.05 \quad P_M = \frac{2}{15} = 0.1333 \quad \text{PPV} = \frac{13}{14} = 0.92857$$

p m shankar





Confusion Matrix : Threshold (optimum) = 3.784

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	1	39
	Target Present	26	4
	Total Counts	27	43

dist to top left corner of the ROC curve = 0.136

Transition Matrix: Threshold (optimum) = 3.784

$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{39}{40} & \frac{2}{15} \\ \frac{1}{40} & \frac{13}{15} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.975 & 0.1333 \\ 0.025 & 0.8667 \end{bmatrix}$$

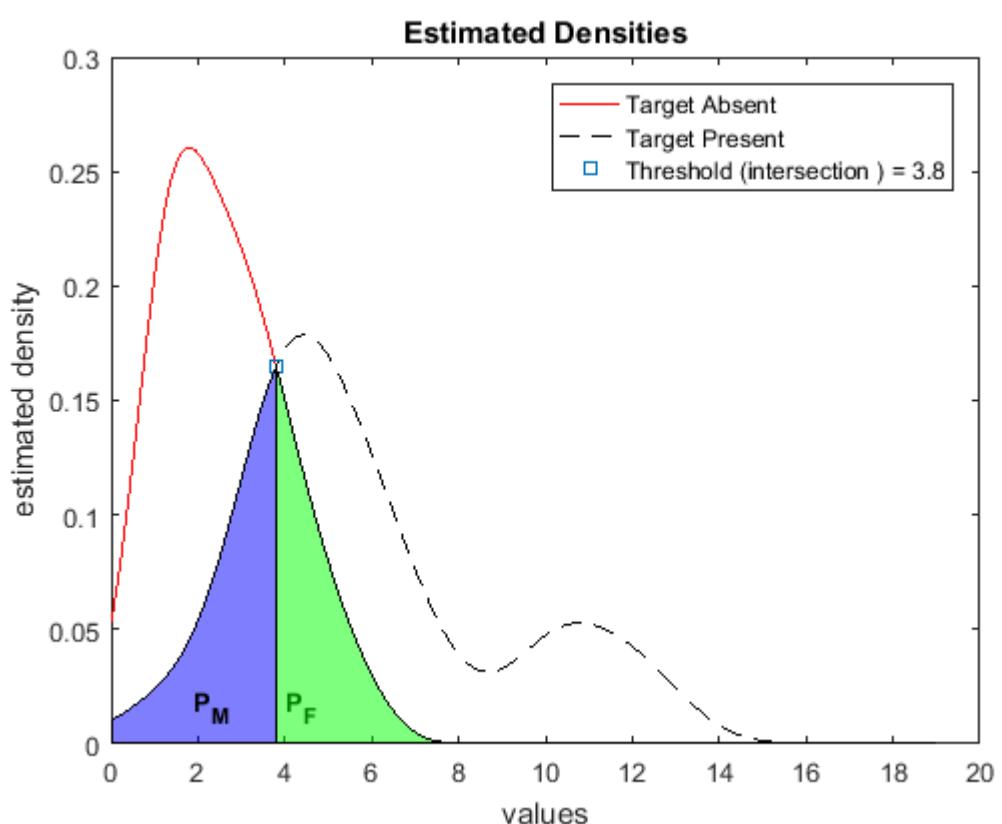
$$P_F = \frac{1}{40} = 0.025 \quad P_M = \frac{2}{15} = 0.1333 \quad \text{PPV} = \frac{26}{27} = 0.96296$$

p m shankar

data (Singh)

Target Absent					Target Present				
0.836	0.595	1.033	3.26	1.775	4.711	3.957	10.156	3.901	3.775
1.595	4.197	1.482	2.716	4.403	12.695	4.276	5.266	3.317	5.451
1.431	2.335	4.766	1.234	0.968	5.23	3.748	6.366	2.953	2.335
1.463	5.886	3.407	1.47	2.038	5.092	6.33	8.001	3.68	10.125
0.913	1.416	2.382	4.703	3.028	5.762	10.281	6.856	4.199	4.597
3.46	2.47	1.652	3.313	2.3	6.437	11.515	11.802	0.914	4.216
2.423	2.657	4.031	2.787	3.194					
5.261	3.833	3.64	1.255	1.717					

(c) P. M. Shankar



Confusion Matrix: Threshold (intersection) = 3.8

Data Collected	Target Detected	Target Not Detected	Total Counts
Target Absent	8	32	40
Target Present	23	7	30
Total Counts	31	39	70

Errors circled

dist to top left corner of the ROC curve = 0.307

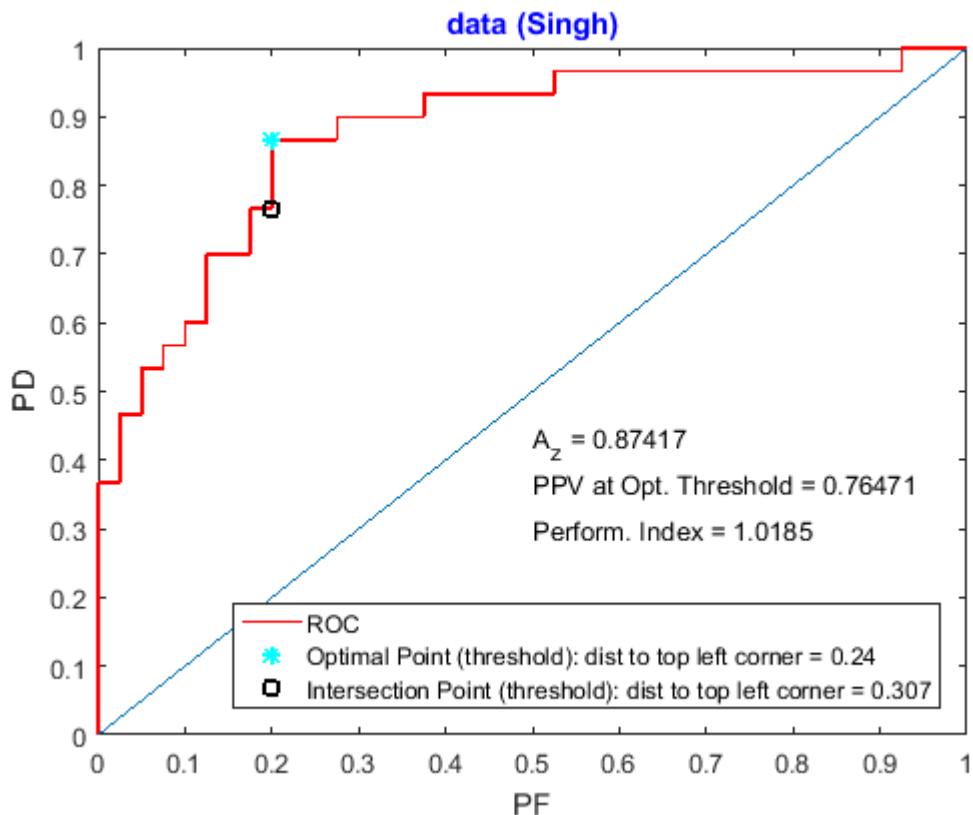
Transition Matrix: Threshold (intersection) = 3.8

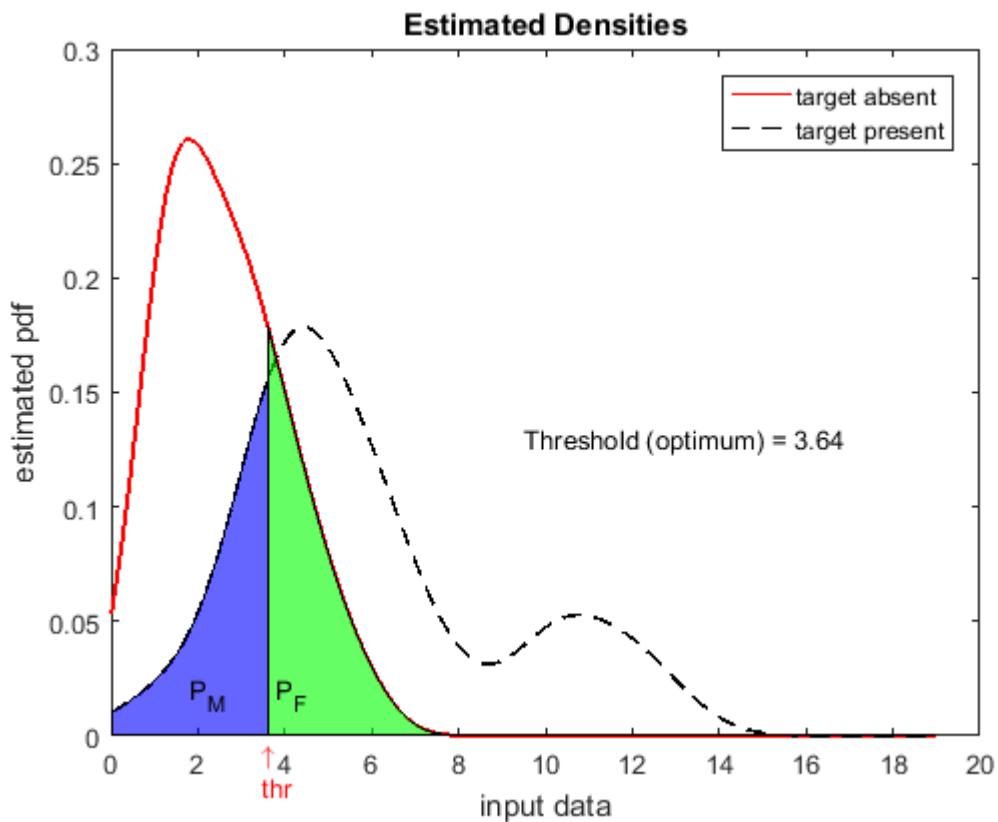
$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{4}{5} & \frac{7}{30} \\ \frac{1}{5} & \frac{23}{30} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.8 & 0.2333 \\ 0.2 & 0.7667 \end{bmatrix}$$

$$P_F = \frac{1}{5} = 0.2 \quad P_M = \frac{7}{30} = 0.2333 \quad \text{PPV} = \frac{23}{31} = 0.74194$$

p m shankar





Confusion Matrix : Threshold (optimum) = 3.64

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	8	32
	Target Present	26	4
	Total Counts	34	36

dist to top left corner of the ROC curve = 0.24

Transition Matrix: Threshold (optimum) = 3.64

$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{4}{5} & \frac{2}{15} \\ \frac{1}{5} & \frac{13}{15} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.8 & 0.1333 \\ 0.2 & 0.8667 \end{bmatrix}$$

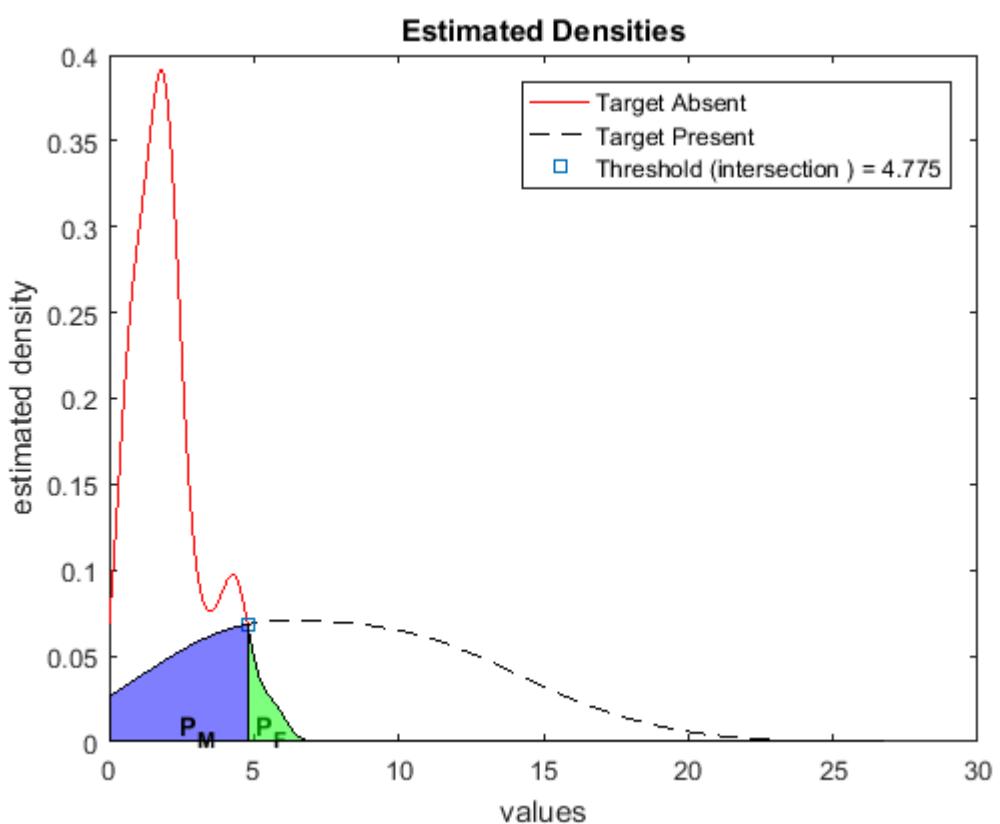
$$P_F = \frac{1}{5} = 0.2 \quad P_M = \frac{2}{15} = 0.1333 \quad \text{PPV} = \frac{13}{17} = 0.76471$$

p m shankar

data (Sinha)

Target Absent					Target Present				
2.124	4.38	4.179	5.609	0.945	12.96	4.529	11.047	7.455	2.883
1.803	1.629	2.291	3.89	1.986	3.058	9.363	17.843	4.44	9.861
1.664	0.756	2.618	1.741	3.242	11.478	15.422	6.639	9.256	1.155
0.722	0.642	2.392	2.254	1.972	3.546	14.251	6.014	2.645	3.922
1.285	1.563	1.754	1.89	1.127	1.494	11.737	6.231	4.893	5.623
1.947	1.975	3.275	2.275	1.464	8.246	11.995	8.76	13.015	9.496
1.867	0.893	1.14	0.436	0.776					
4.492	0.568	1.828	0.67	4.55					

(c) P. M. Shankar



Confusion Matrix: Threshold (intersection) = 4.775

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	1	39
	Target Present	21	9
	Total Counts	22	48

dist to top left corner of the ROC curve = 0.301

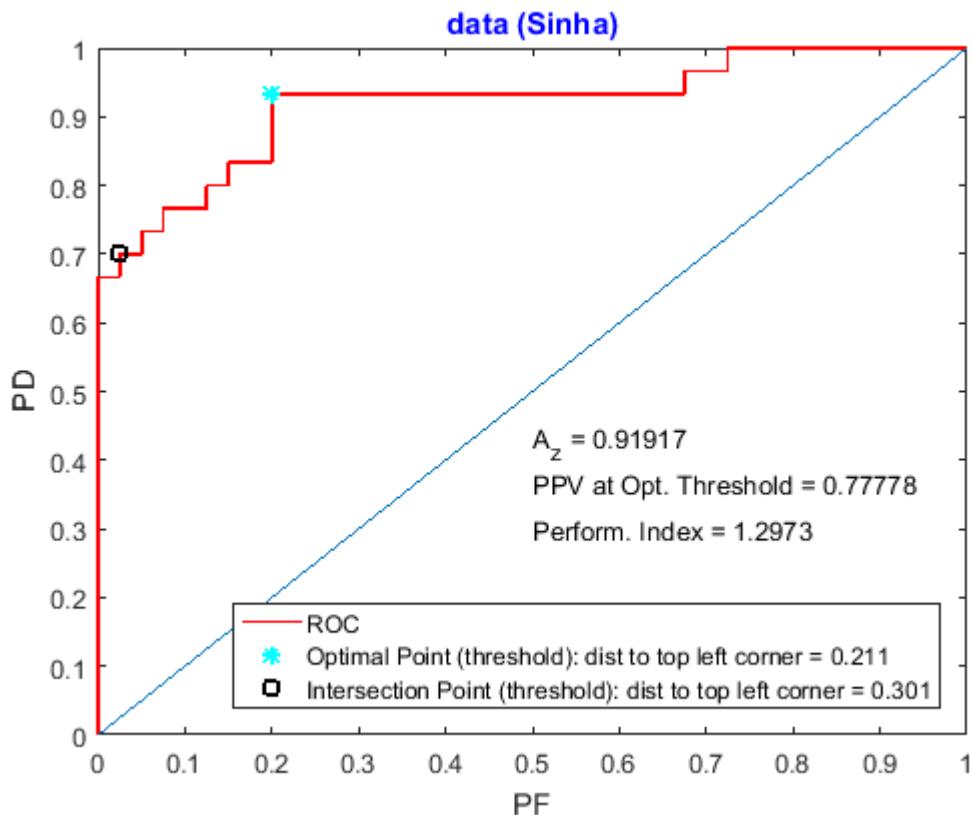
Transition Matrix: Threshold (intersection) = 4.775

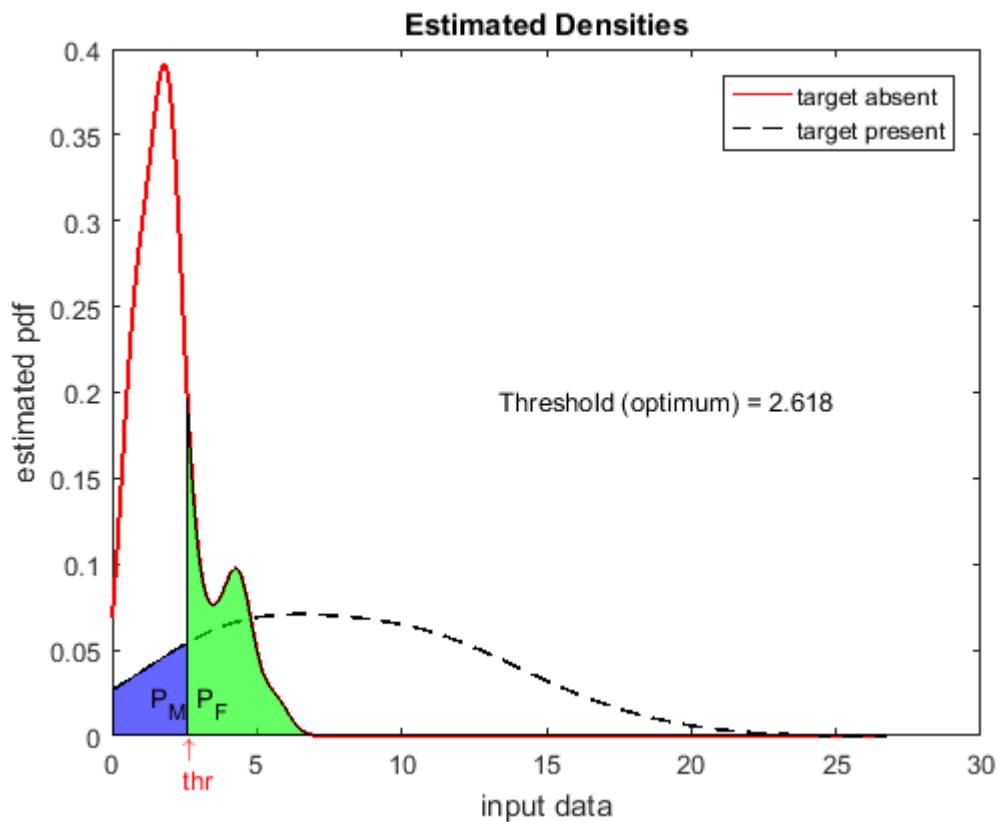
$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{39}{40} & \frac{3}{10} \\ \frac{1}{40} & \frac{7}{10} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.975 & 0.3 \\ 0.025 & 0.7 \end{bmatrix}$$

$$P_F = \frac{1}{40} = 0.025 \quad P_M = \frac{3}{10} = 0.3 \quad \text{PPV} = \frac{21}{22} = 0.95455$$

p m shankar





Confusion Matrix : Threshold (optimum) = 2.618

Data Collected		Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	8	32	40
	Target Present	28	2	30
	Total Counts	36	34	70

dist to top left corner of the ROC curve = 0.211

Transition Matrix: Threshold (optimum) = 2.618

$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{4}{5} & \frac{1}{15} \\ \frac{1}{5} & \frac{14}{15} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.8 & 0.0667 \\ 0.2 & 0.9333 \end{bmatrix}$$

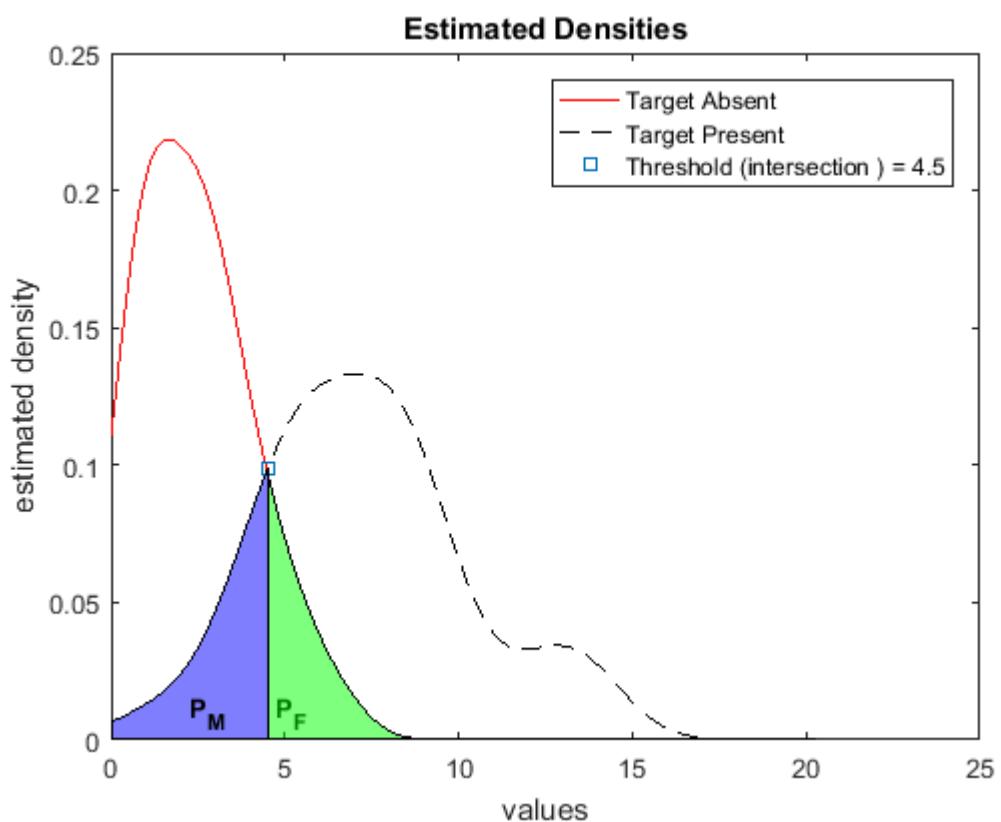
$$P_F = \frac{1}{5} = 0.2 \quad P_M = \frac{1}{15} = 0.06667 \quad \text{PPV} = \frac{7}{9} = 0.77778$$

p m shankar

data (Sohan)

Target Absent					Target Present				
2.49	1.067	2.33	2.809	0.714	9.209	6.471	12.901	13.493	7.32
2.3	4.456	3.422	1.135	1.674	5.238	6.16	5.335	5.558	5.895
4.233	3.258	2.3	0.841	2.986	1.344	5.314	3.779	4.009	9.378
0.344	2.726	0.678	1.599	1.062	11.439	8.137	8.054	8.462	8.591
2.551	2.505	3.311	1.474	5.542	4.109	6.716	5.484	8.613	8.009
1.772	1.439	3.828	1.02	0.527	7.875	4.176	6.869	13.52	9.22
3.068	0.474	0.47	4.753	0.37					
3.263	1.599	5.361	4.26	6.593					

(c) P. M. Shankar



Confusion Matrix: Threshold (intersection) = 4.5

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	4	36
	Target Present	25	5
	Total Counts	29	41

dist to top left corner of the ROC curve = 0.194

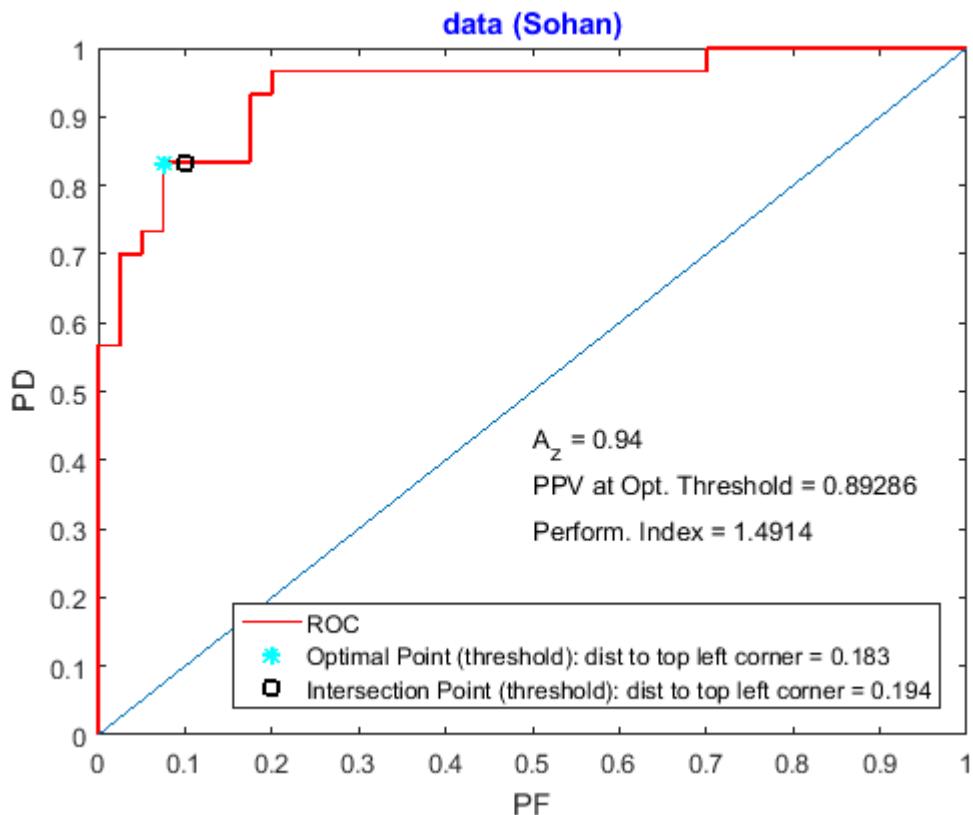
Transition Matrix: Threshold (intersection) = 4.5

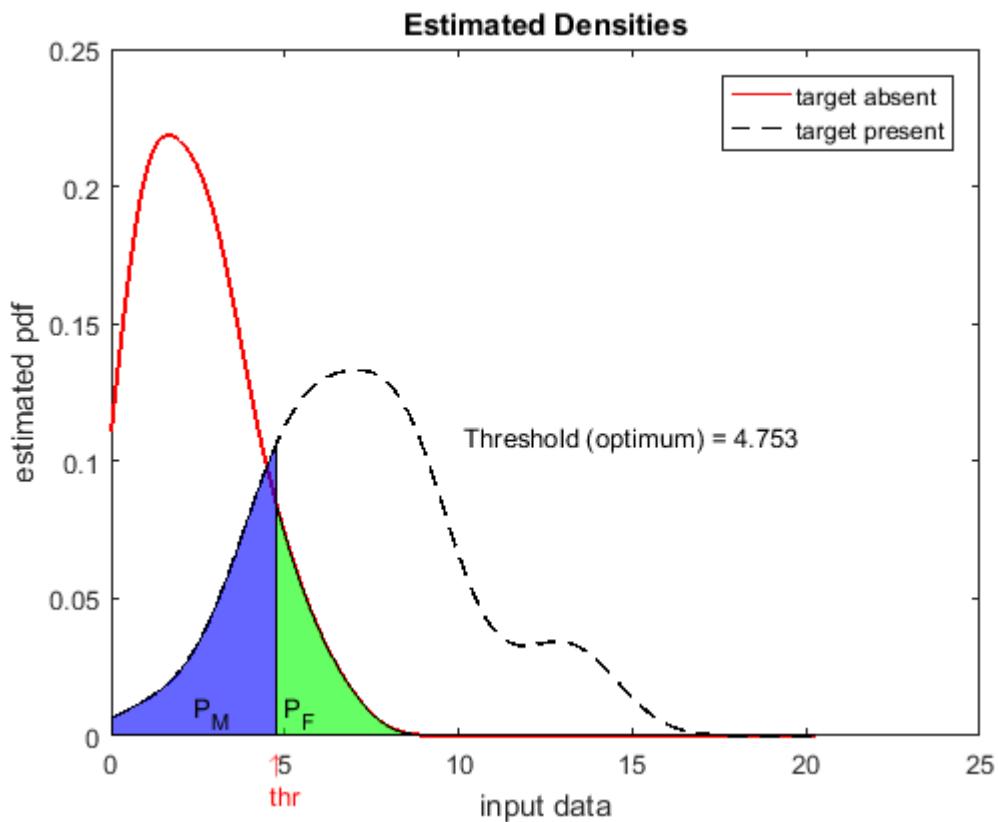
$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{9}{10} & \frac{1}{6} \\ \frac{1}{10} & \frac{5}{6} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.9 & 0.16667 \\ 0.1 & 0.8333 \end{bmatrix}$$

$$P_F = \frac{1}{10} = 0.1 \quad P_M = \frac{1}{6} = 0.16667 \quad \text{PPV} = \frac{25}{29} = 0.86207$$

p m shankar





Confusion Matrix : Threshold (optimum) = 4.753

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	3	37
	Target Present	25	5
	Total Counts	28	42

dist to top left corner of the ROC curve = 0.183

Transition Matrix: Threshold (optimum) = 4.753

$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{37}{40} & \frac{1}{6} \\ \frac{3}{40} & \frac{5}{6} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.925 & 0.1667 \\ 0.075 & 0.8333 \end{bmatrix}$$

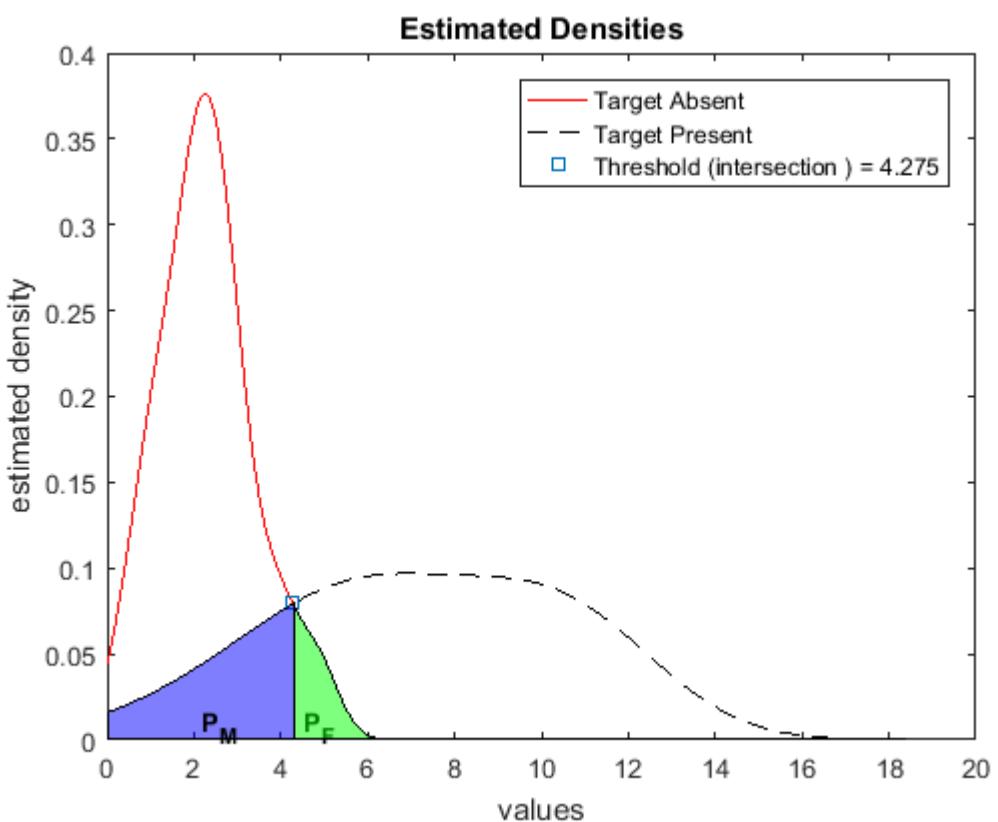
$$P_F = \frac{3}{40} = 0.075 \quad P_M = \frac{1}{6} = 0.16667 \quad \text{PPV} = \frac{25}{28} = 0.89286$$

p m shankar

data (Stanford)

Target Absent					Target Present				
1.596	2.585	1.101	4.829	1.945	7.243	10.664	5.309	11.574	5.18
2.77	2.143	0.894	2.289	2.591	5.068	2.976	8.51	10.55	8.547
3.808	2.137	1.649	0.42	3.835	0.57	7.26	2.38	9.874	5.422
2.29	2.504	2.938	2.951	1.924	4.725	12.268	9.526	9.138	6.88
4.905	1.984	0.336	0.984	2.362	5.414	11.15	6.224	6.19	3.535
1.099	2.812	3.027	3.016	2.682	10.919	9.757	3.298	7.607	11.123
1.06	2.35	4.195	1.706	1.952					
1.441	1.826	2.264	1.044	3.689					

(c) P. M. Shankar



Confusion Matrix: Threshold (intersection) = 4.275

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	2	38
	Target Present	25	5
	Total Counts	27	43

dist to top left corner of the ROC curve = 0.174

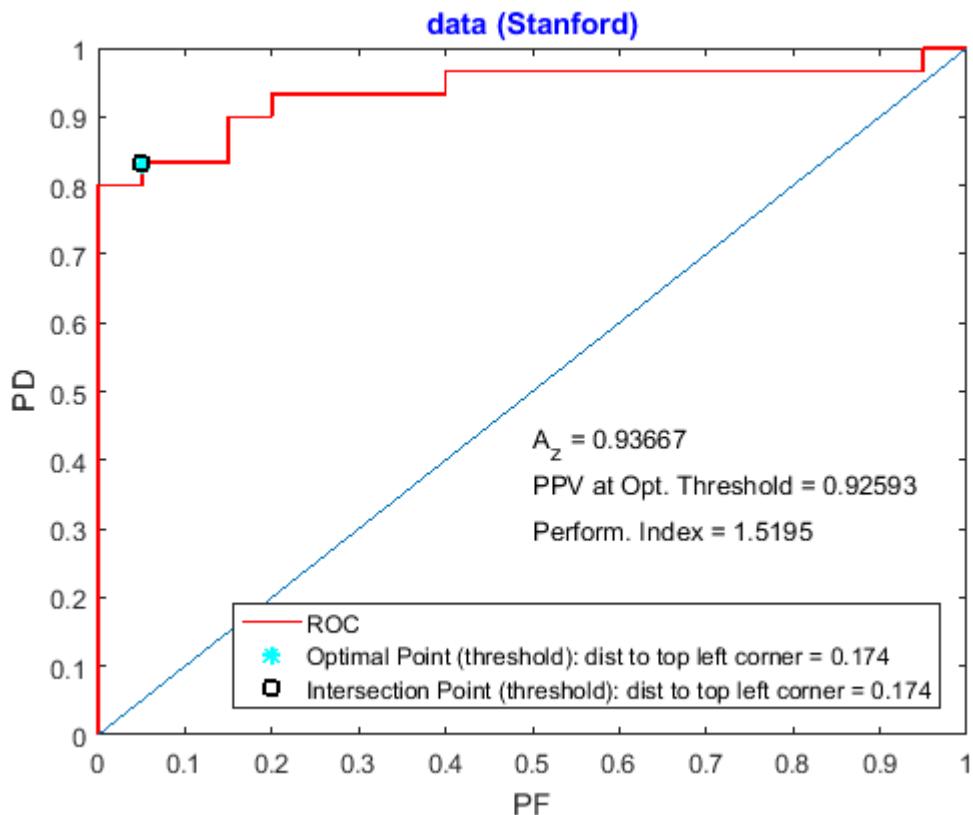
Transition Matrix: Threshold (intersection) = 4.275

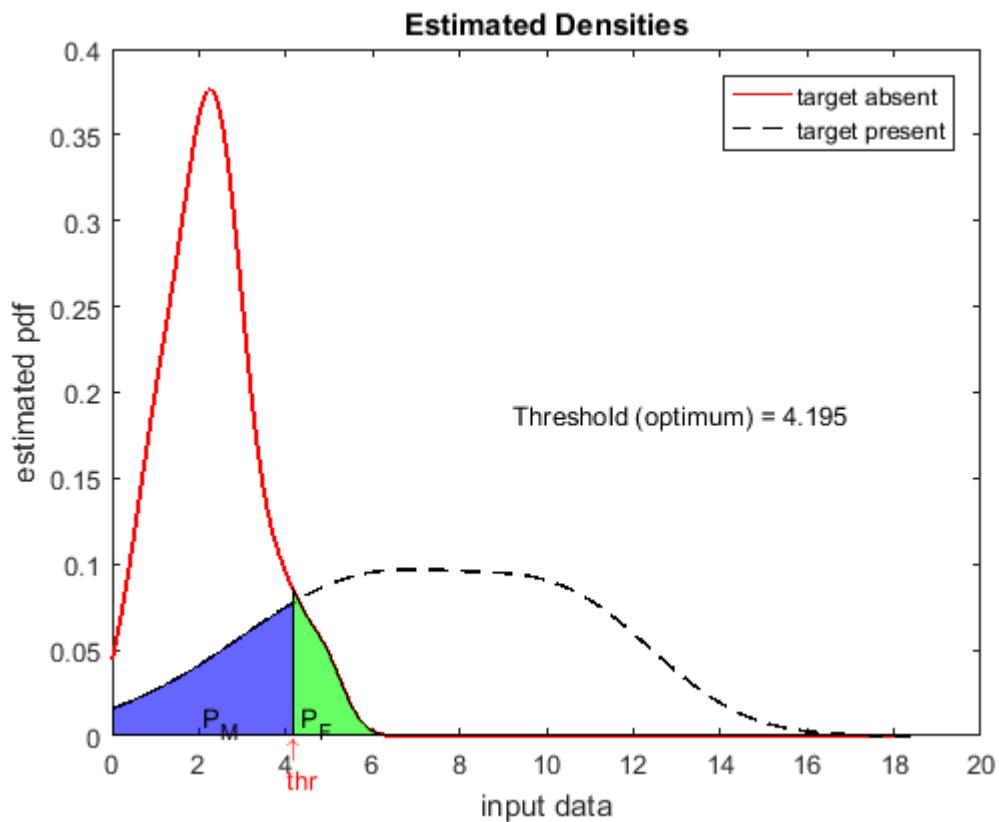
$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{19}{20} & \frac{1}{6} \\ \frac{1}{20} & \frac{5}{6} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.95 & 0.16667 \\ 0.05 & 0.8333 \end{bmatrix}$$

$$P_F = \frac{1}{20} = 0.05 \quad P_M = \frac{1}{6} = 0.16667 \quad \text{PPV} = \frac{25}{27} = 0.92593$$

p m shankar





Confusion Matrix : Threshold (optimum) = 4.195

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	2	38
	Target Present	25	5
	Total Counts	27	43

dist to top left corner of the ROC curve = 0.174

Transition Matrix: Threshold (optimum) = 4.195

$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{19}{20} & \frac{1}{6} \\ \frac{1}{20} & \frac{5}{6} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.95 & 0.16667 \\ 0.05 & 0.8333 \end{bmatrix}$$

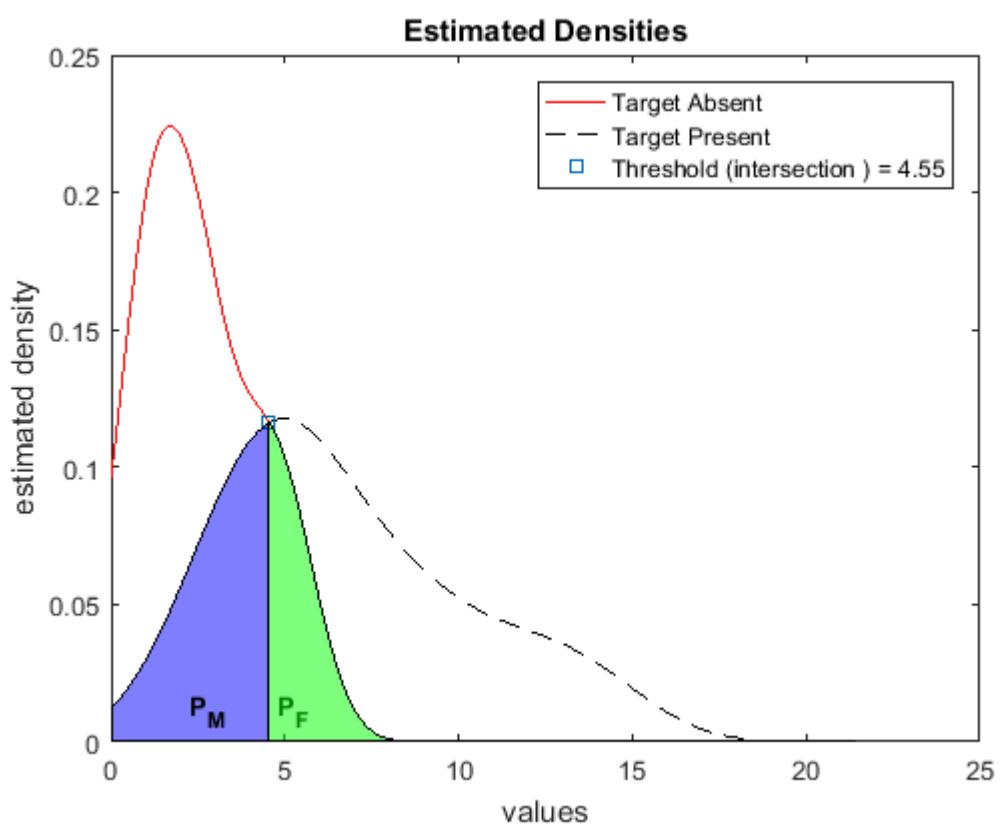
$$P_F = \frac{1}{20} = 0.05 \quad P_M = \frac{1}{6} = 0.16667 \quad \text{PPV} = \frac{25}{27} = 0.92593$$

p m shankar

data (Syrlo)

Target Absent					Target Present				
4.123	4.637	0.783	1.791	0.862	4.719	6.974	10.135	5.414	8.887
4.806	0.782	1.16	1.212	3.91	6.258	5.155	3.456	3.977	3.907
4.254	1.727	2.577	1.566	2.793	7.415	12.33	2.461	3.723	12.265
0.904	4.962	2.877	1.83	1.312	5.347	4.173	9.49	5.84	14.052
0.793	0.999	5.688	1.145	0.161	5.174	11.529	6.399	3.032	2.279
3.021	2.225	5.694	3.102	4.324	4.009	14.319	8.462	8.653	6.182
4.766	5.062	2.347	0.466	1.91					
1.253	2.385	2.472	2.495	2.654					

(c) P. M. Shankar



Confusion Matrix: Threshold (intersection) = 4.55

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	7	33
	Target Present	21	9
	Total Counts	28	42

dist to top left corner of the ROC curve = 0.347

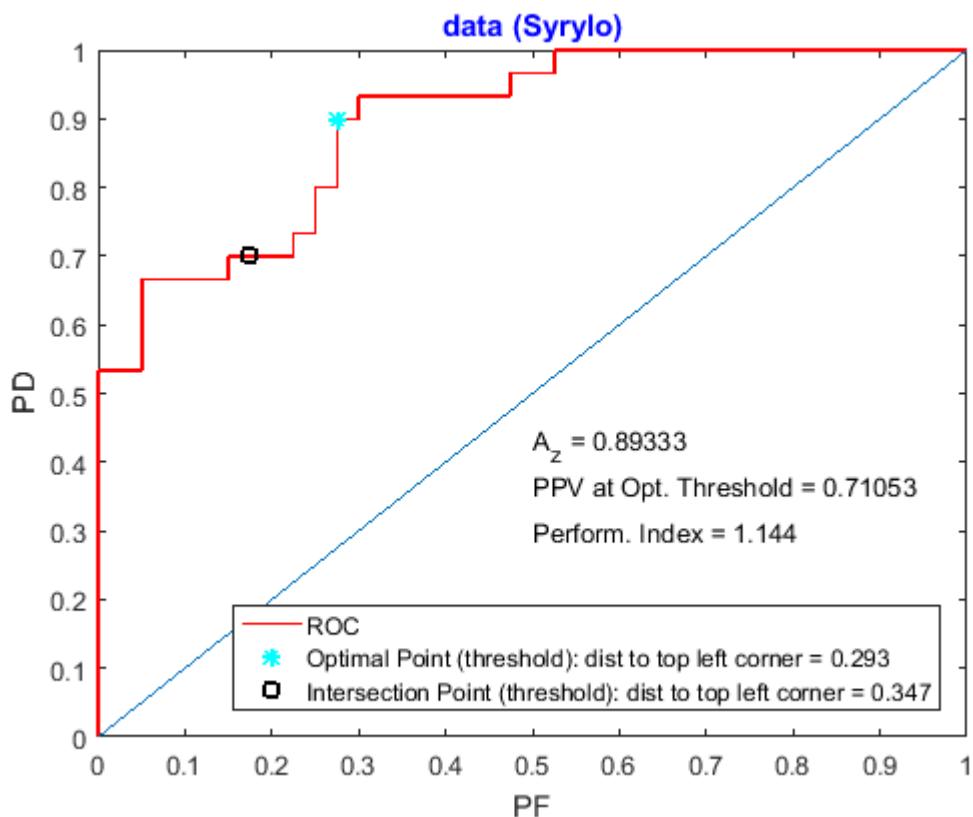
Transition Matrix: Threshold (intersection) = 4.55

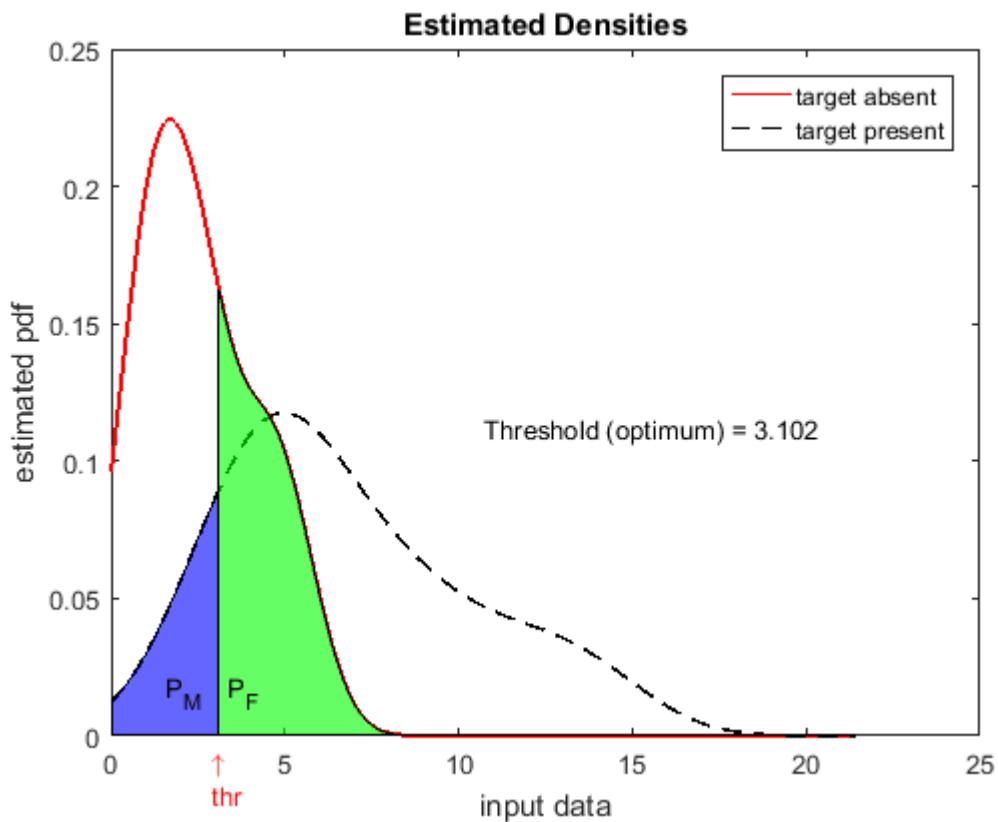
$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{33}{40} & \frac{3}{10} \\ \frac{7}{40} & \frac{7}{10} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.825 & 0.3 \\ 0.175 & 0.7 \end{bmatrix}$$

$$P_F = \frac{7}{40} = 0.175 \quad P_M = \frac{3}{10} = 0.3 \quad \text{PPV} = \frac{3}{4} = 0.75$$

p m shankar





Confusion Matrix : Threshold (optimum) = 3.102

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	11	29
	Target Present	27	3
	Total Counts	38	32

dist to top left corner of the ROC curve = 0.293

Transition Matrix: Threshold (optimum) = 3.102

$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{29}{40} & \frac{1}{10} \\ \frac{11}{40} & \frac{9}{10} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.725 & 0.1 \\ 0.275 & 0.9 \end{bmatrix}$$

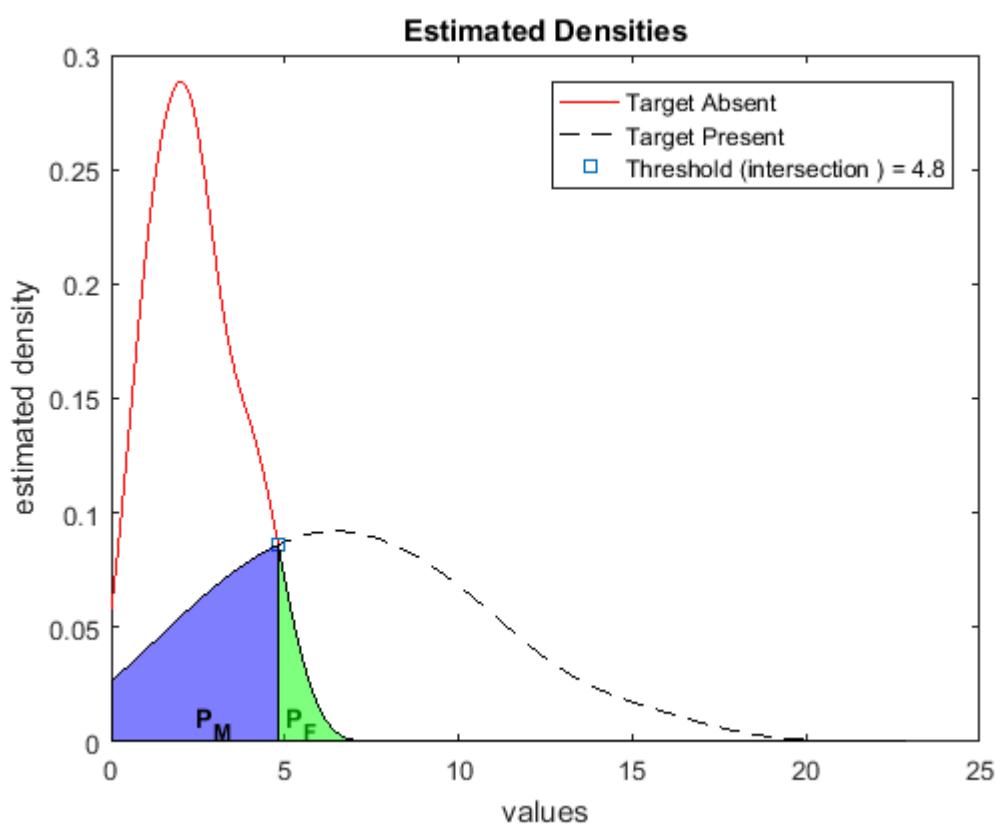
$$P_F = \frac{11}{40} = 0.275 \quad P_M = \frac{1}{10} = 0.1 \quad \text{PPV} = \frac{27}{38} = 0.71053$$

p m shankar

data (Teperov)

Target Absent					Target Present				
4.16	2.209	2.089	2.56	4.564	11.163	4.843	9.957	14.58	6.162
1.163	0.914	4.011	3.377	1.354	3.606	11.479	10.433	1.203	5.738
2.838	2.179	3.059	4.787	2.286	9.392	5.904	7.925	1.967	8.033
3.954	4.23	2.737	1.836	1.274	3.477	9.601	1.94	3.946	7.372
0.961	2.321	3.918	2.993	1.315	6.635	4.466	5.997	3.769	7.662
1.333	5.297	2.353	0.913	2.565	10.503	6.214	8.177	1.138	15.244
2.317	2.168	0.699	0.669	2.114					
1.964	3.644	1.378	0.84	1.777					

(c) P. M. Shankar



Confusion Matrix: Threshold (intersection) = 4.8

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	1	39
	Target Present	21	9
	Total Counts	22	48

dist to top left corner of the ROC curve = 0.301

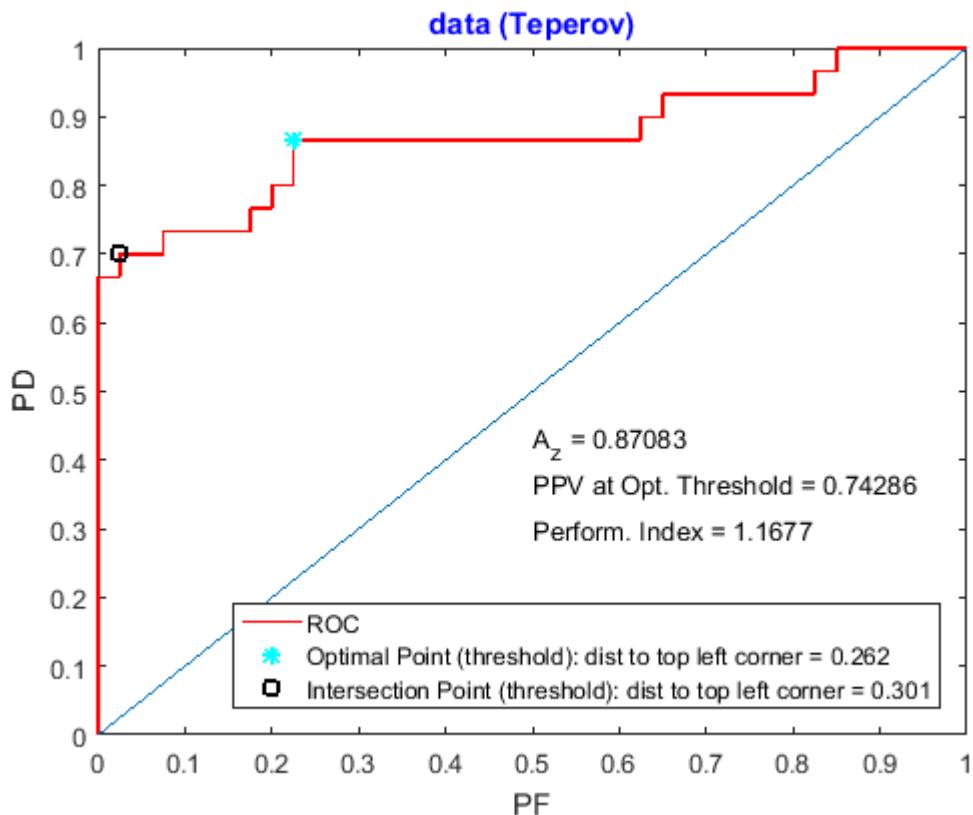
Transition Matrix: Threshold (intersection) = 4.8

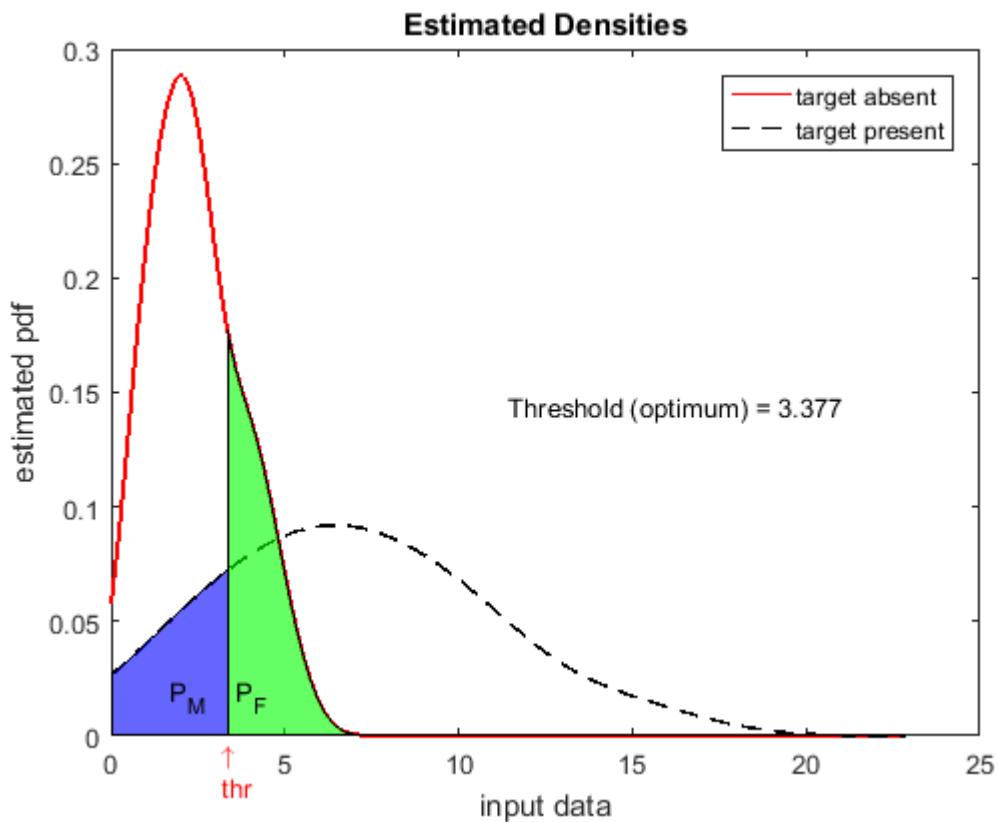
$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{39}{40} & \frac{3}{10} \\ \frac{1}{40} & \frac{7}{10} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.975 & 0.3 \\ 0.025 & 0.7 \end{bmatrix}$$

$$P_F = \frac{1}{40} = 0.025 \quad P_M = \frac{3}{10} = 0.3 \quad \text{PPV} = \frac{21}{22} = 0.95455$$

p m shankar





Confusion Matrix : Threshold (optimum) = 3.377

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	9	31
	Target Present	26	4
	Total Counts	35	35
			70

dist to top left corner of the ROC curve = 0.262

Transition Matrix: Threshold (optimum) = 3.377

$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{31}{40} & \frac{2}{15} \\ \frac{9}{40} & \frac{13}{15} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.775 & 0.1333 \\ 0.225 & 0.8667 \end{bmatrix}$$

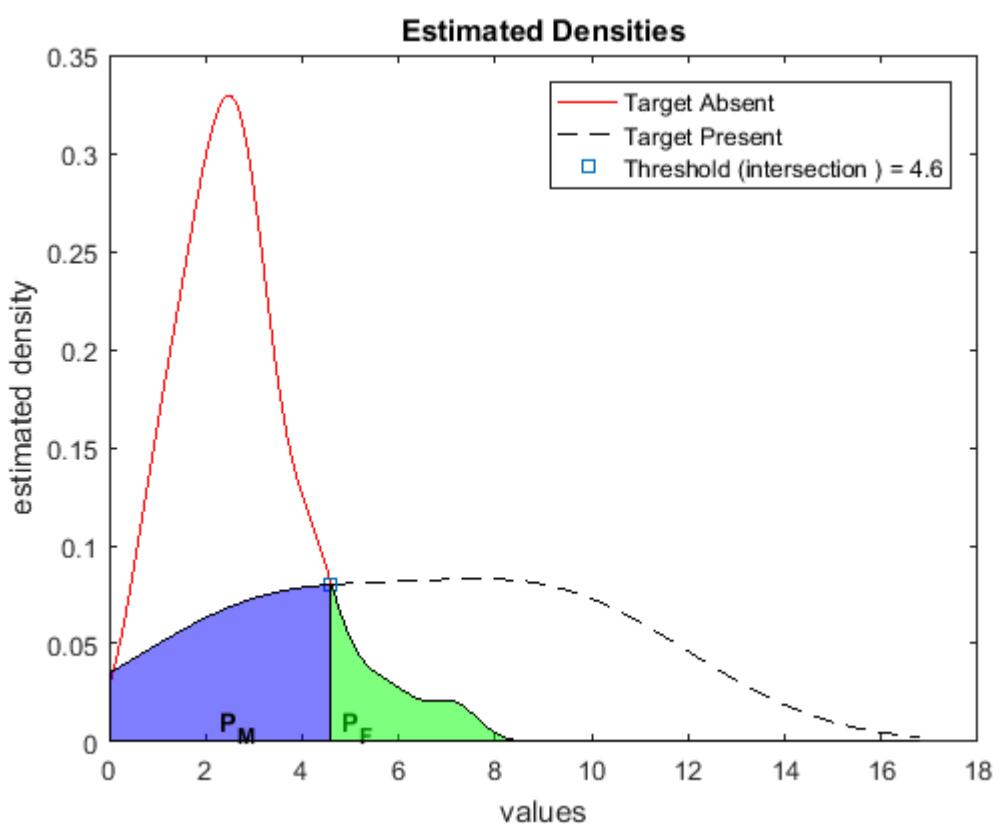
$$P_F = \frac{9}{40} = 0.225 \quad P_M = \frac{2}{15} = 0.1333 \quad \text{PPV} = \frac{26}{35} = 0.74286$$

p m shankar

data (Traore)

Target Absent					Target Present				
4.519	3.079	2.513	7.124	2.548	1.461	8.513	3.015	4.551	11.225
0.959	1.241	3.326	1.165	0.587	9.152	2.884	1.569	3.059	10.175
1.954	3.054	2.761	1.614	2.721	2.498	10.139	6.567	9.092	2.956
2.863	2.157	2.101	0.638	1.873	8.842	3.371	7.715	6.999	6.112
5.952	2.737	2.286	3.438	1.251	9.044	7.539	4.673	11.056	10.202
2.382	5.222	4.074	1.752	2.137	8.954	3.497	3.685	2.585	10.689
1.924	1.797	2.84	1.175	4.301					
2.982	2.502	3.893	4.143	3.014					

(c) P. M. Shankar



Confusion Matrix: Threshold (intersection) = 4.6

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	3	37
	Target Present	18	12
	Total Counts	21	49

dist to top left corner of the ROC curve = 0.407

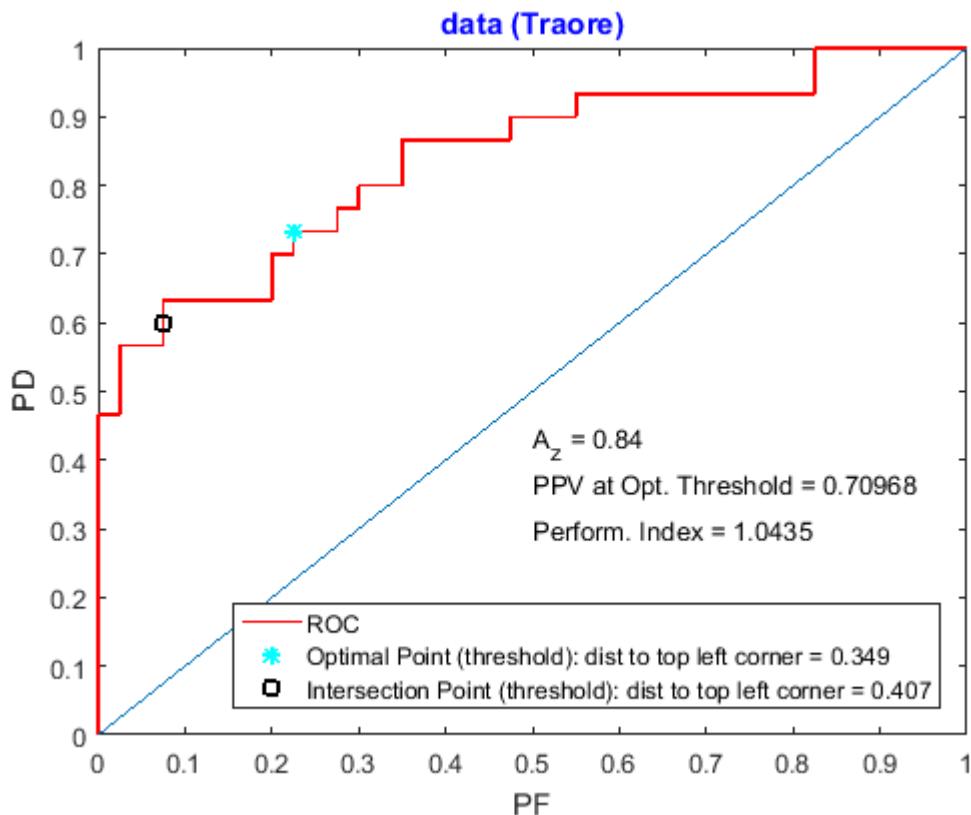
Transition Matrix: Threshold (intersection) = 4.6

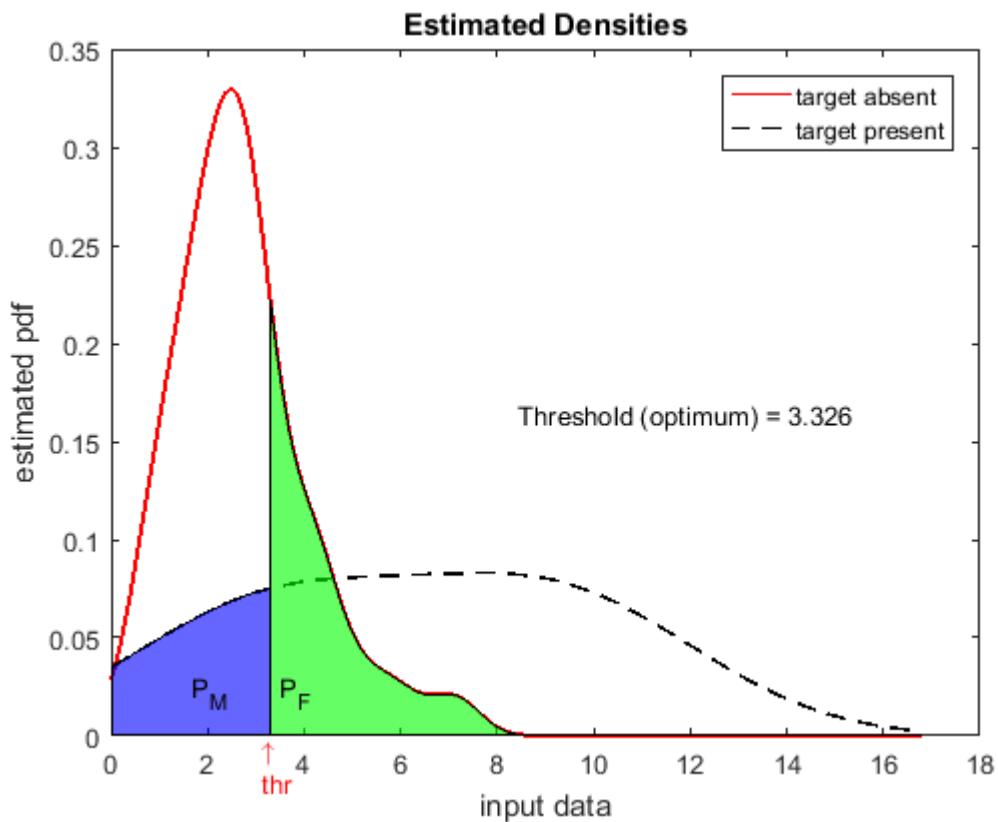
$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{37}{40} & \frac{2}{5} \\ \frac{3}{40} & \frac{3}{5} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.925 & 0.4 \\ 0.075 & 0.6 \end{bmatrix}$$

$$P_F = \frac{3}{40} = 0.075 \quad P_M = \frac{2}{5} = 0.4 \quad \text{PPV} = \frac{6}{7} = 0.85714$$

p m shankar





Confusion Matrix : Threshold (optimum) = 3.326

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	9	31
	Target Present	22	8
	Total Counts	31	39

dist to top left corner of the ROC curve = 0.349

Transition Matrix: Threshold (optimum) = 3.326

$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{31}{40} & \frac{4}{15} \\ \frac{9}{40} & \frac{11}{15} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.775 & 0.2667 \\ 0.225 & 0.7333 \end{bmatrix}$$

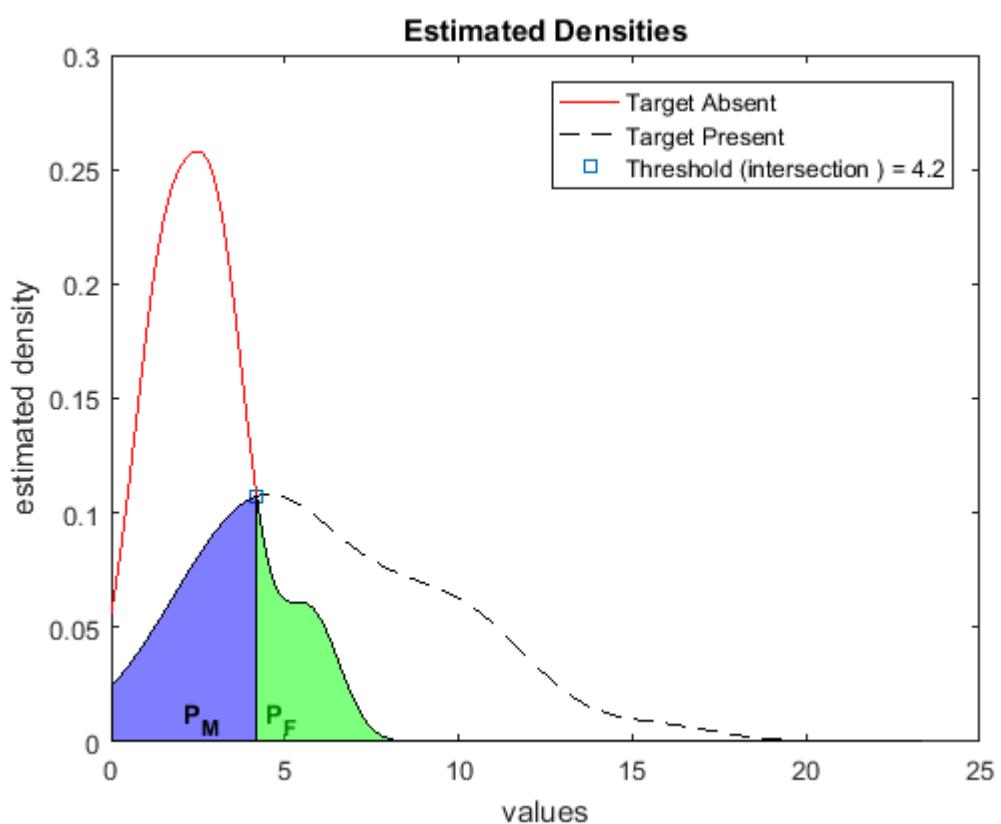
$$P_F = \frac{9}{40} = 0.225 \quad P_M = \frac{4}{15} = 0.26667 \quad \text{PPV} = \frac{22}{31} = 0.70968$$

p m shankar

data (Truong)

Target Absent					Target Present				
3.19	2.948	2.381	1.487	3.459	6.823	9.313	4.689	11.396	3.669
1.596	0.716	2.833	0.644	1.41	1.687	9.613	3.129	0.95	5.468
1.336	2.533	6.248	1.432	5.95	5.214	11.013	11.257	4.119	2.685
2.113	3.166	3.327	3.679	3.893	5.872	4.916	5.097	4.025	2.3
2.589	1.446	1.827	2.503	3.274	4.322	15.567	9.669	10.351	7.175
5.073	0.169	1.634	3.244	2.807	8.251	4.371	3.02	7.791	7.556
1.561	3.881	5.71	1.389	1.52					
2.576	2.938	2.789	5.375	1.123					

(c) P. M. Shankar



Confusion Matrix: Threshold (intersection) = 4.2

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	5	35
	Target Present	21	9
	Total Counts	26	44

dist to top left corner of the ROC curve = 0.325

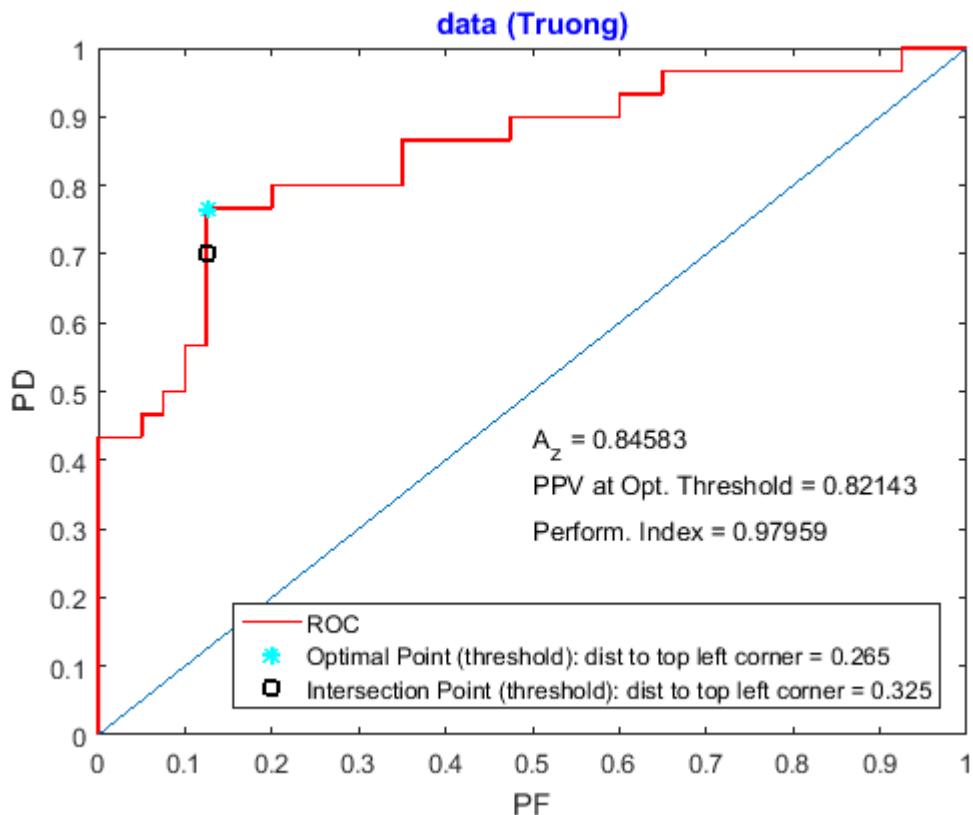
Transition Matrix: Threshold (intersection) = 4.2

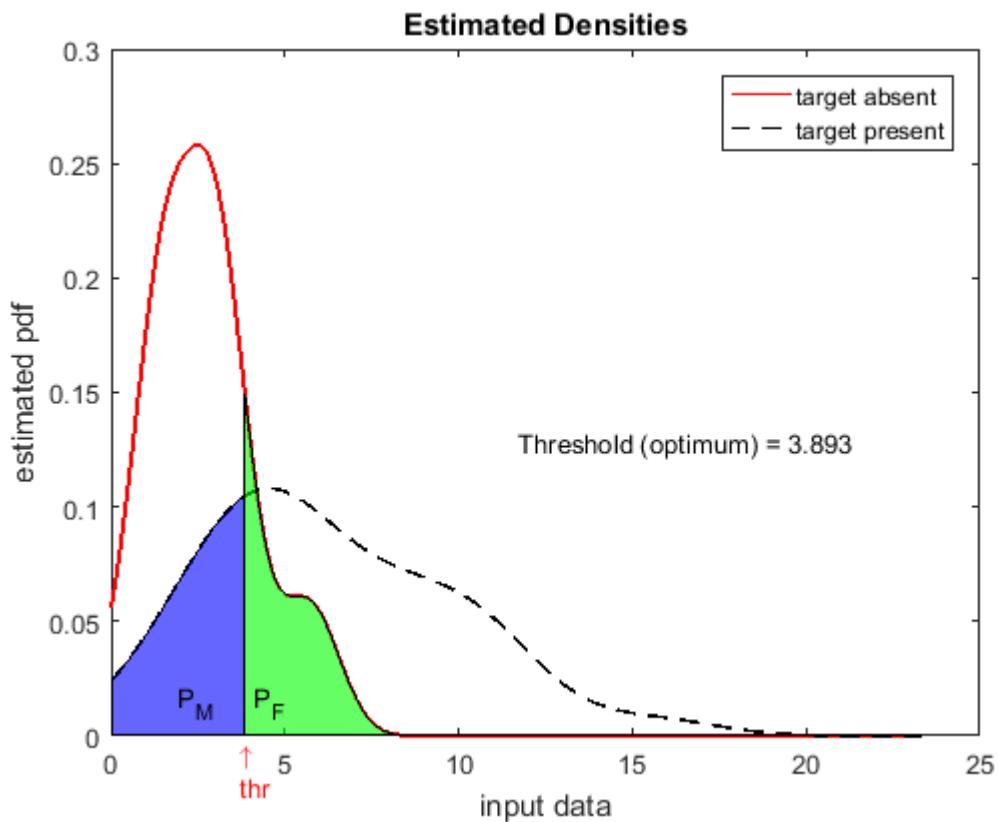
$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{7}{8} & \frac{3}{10} \\ \frac{1}{8} & \frac{7}{10} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.875 & 0.3 \\ 0.125 & 0.7 \end{bmatrix}$$

$$P_F = \frac{1}{8} = 0.125 \quad P_M = \frac{3}{10} = 0.3 \quad \text{PPV} = \frac{21}{26} = 0.80769$$

p m shankar





Confusion Matrix : Threshold (optimum) = 3.893

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	5	35
	Target Present	23	7
	Total Counts	28	42

dist to top left corner of the ROC curve = 0.265

Transition Matrix: Threshold (optimum) = 3.893

$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{7}{8} & \frac{7}{30} \\ \frac{1}{8} & \frac{23}{30} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.875 & 0.2333 \\ 0.125 & 0.7667 \end{bmatrix}$$

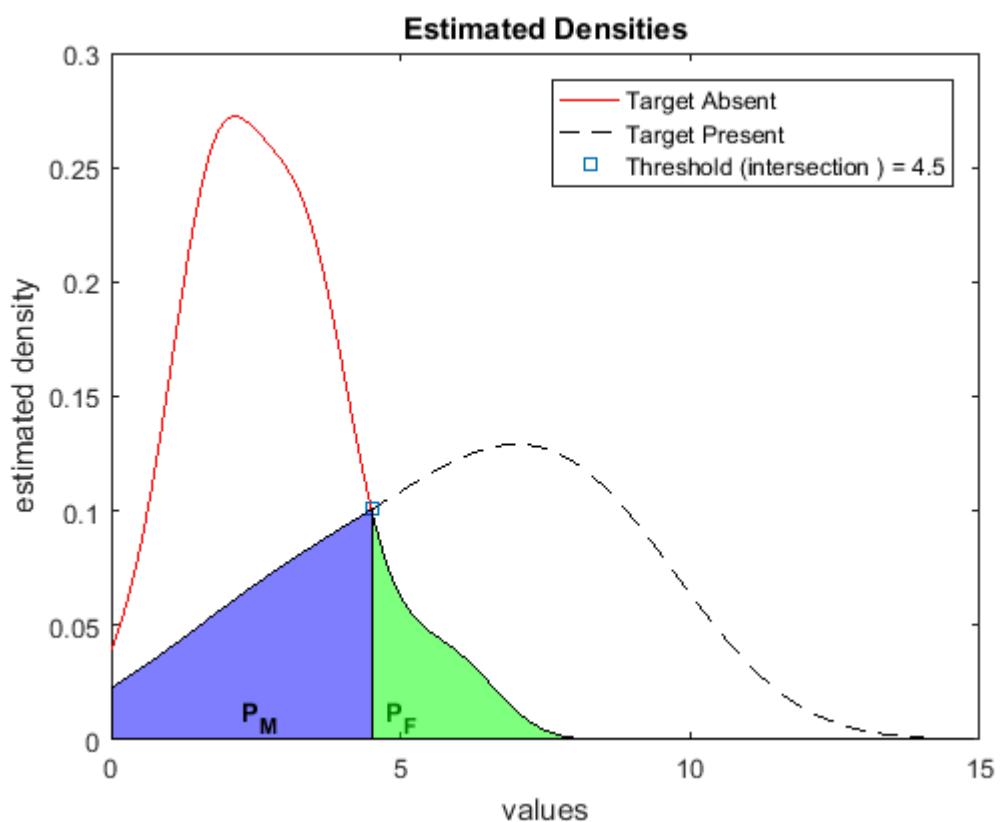
$$P_F = \frac{1}{8} = 0.125 \quad P_M = \frac{7}{30} = 0.2333 \quad \text{PPV} = \frac{23}{28} = 0.82143$$

p m shankar

data (Tweed)

Target Absent					Target Present				
5.72	2.106	6.374	3.763	1.68	6.669	9.961	5.47	7.038	6.253
3.185	3.761	3.427	2.023	5.321	1.105	2.079	4.884	8.054	3.704
3.631	1.532	1.808	0.582	4.627	4.116	3.504	3.376	6.475	9.199
0.141	2.579	1.344	1.741	3.515	1.047	8.627	2.677	5.796	7.088
1.157	2.236	2.825	3.548	2.469	6.052	6.845	7.531	8.598	5.629
2.964	1.276	2.405	2.026	1.639	8.181	9.258	8.565	3.586	8.364
1.678	4.325	2.279	3.139	1.456					
3.916	3.458	3.005	3.032	1.681					

(c) P. M. Shankar



Confusion Matrix: Threshold (intersection) = 4.5

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	4	36
	Target Present	21	9
	Total Counts	25	45

dist to top left corner of the ROC curve = 0.316

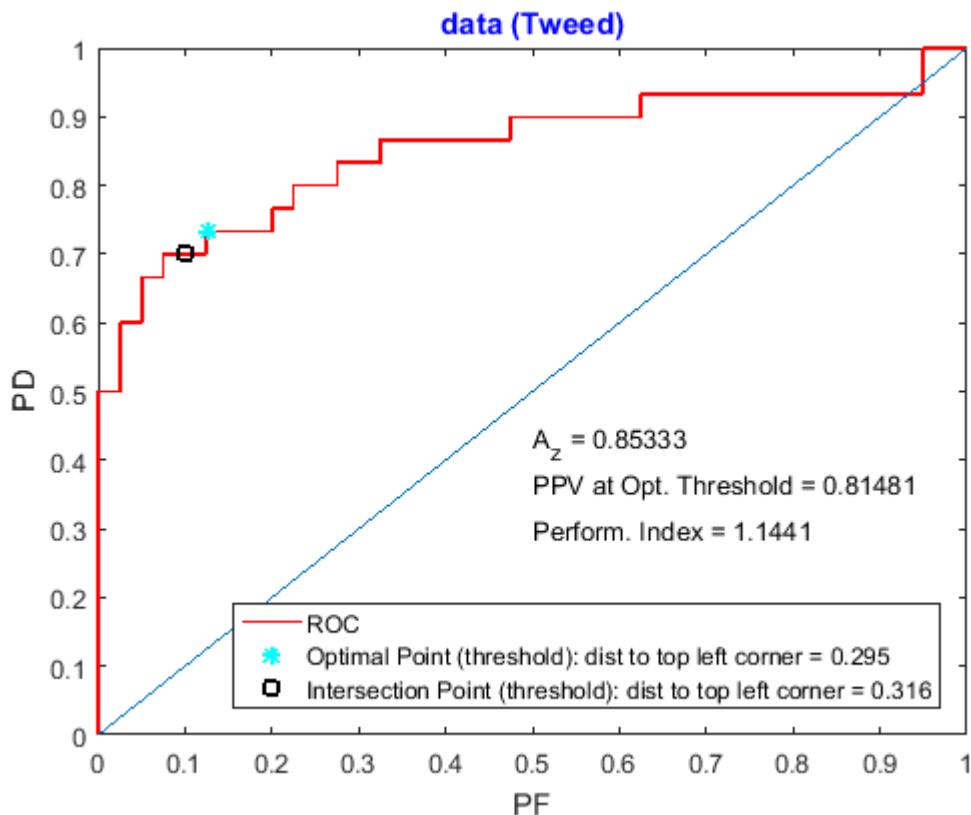
Transition Matrix: Threshold (intersection) = 4.5

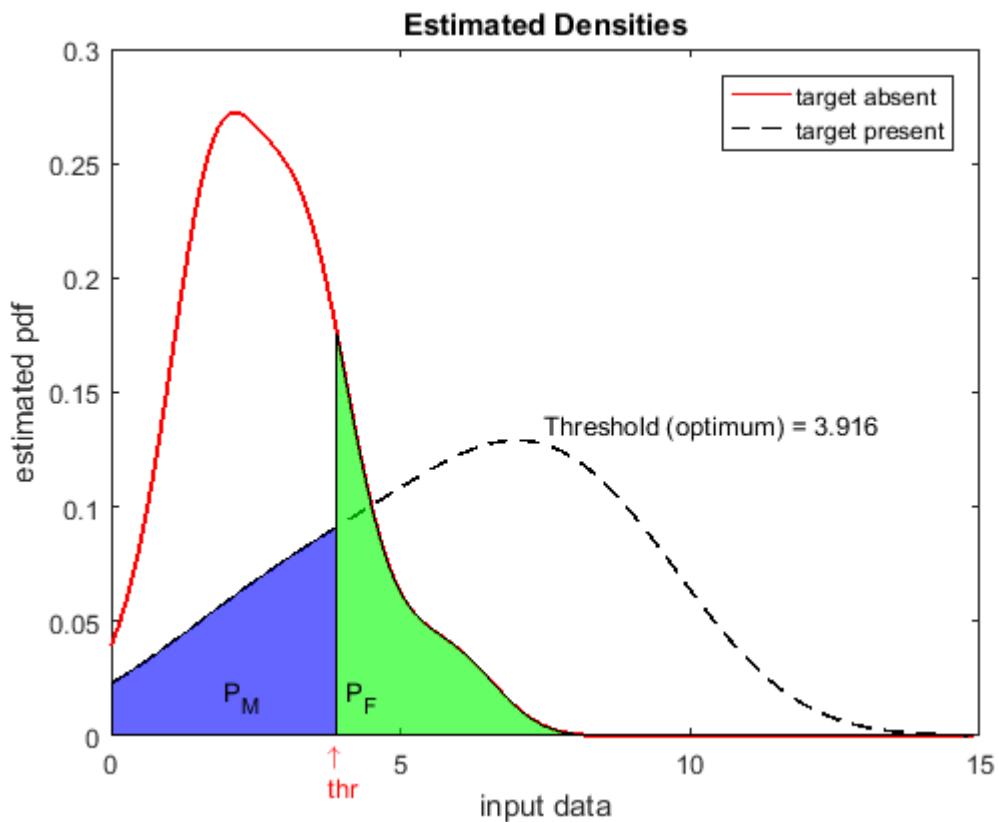
$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{9}{10} & \frac{3}{10} \\ \frac{1}{10} & \frac{7}{10} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.9 & 0.3 \\ 0.1 & 0.7 \end{bmatrix}$$

$$P_F = \frac{1}{10} = 0.1 \quad P_M = \frac{3}{10} = 0.3 \quad \text{PPV} = \frac{21}{25} = 0.84$$

p m shankar





Confusion Matrix : Threshold (optimum) = 3.916

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	5	35
	Target Present	22	8
	Total Counts	27	43

dist to top left corner of the ROC curve = 0.295

Transition Matrix: Threshold (optimum) = 3.916

$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{7}{8} & \frac{4}{15} \\ \frac{1}{8} & \frac{11}{15} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.875 & 0.2667 \\ 0.125 & 0.7333 \end{bmatrix}$$

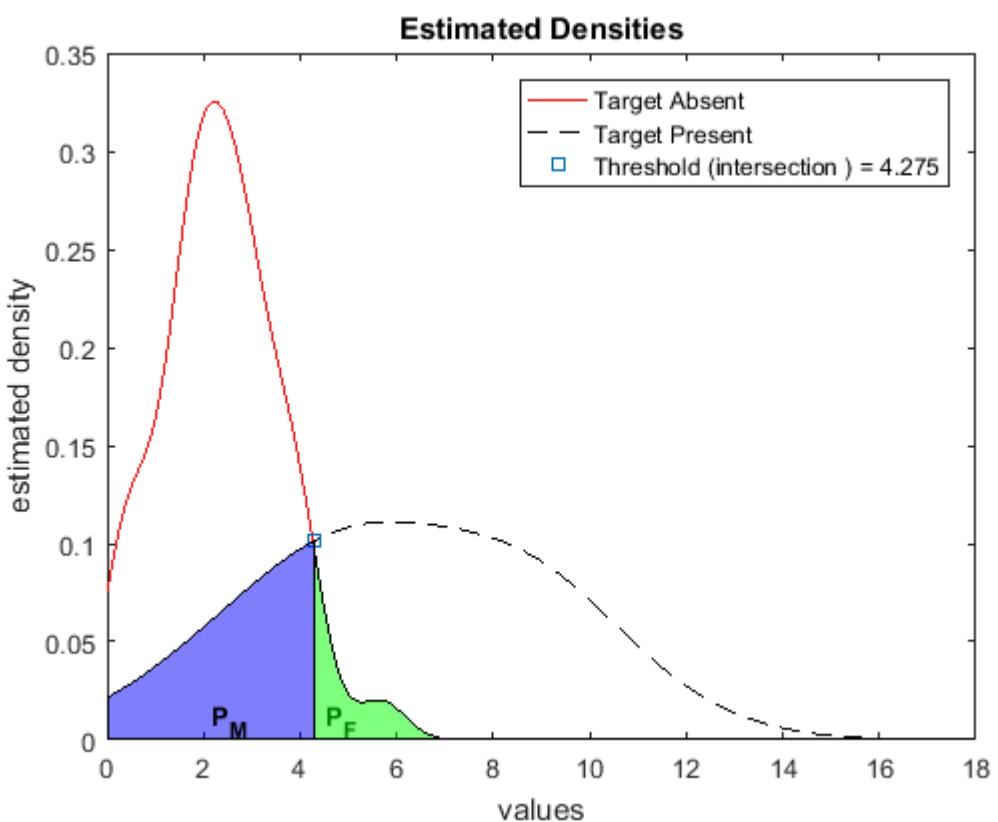
$$P_F = \frac{1}{8} = 0.125 \quad P_M = \frac{4}{15} = 0.26667 \quad \text{PPV} = \frac{22}{27} = 0.81481$$

p m shankar

data (Vader)

Target Absent					Target Present				
2.004	3.712	3.434	2.898	1.533	9.502	7.306	11.978	8.523	8.039
1.781	1.864	2.187	1.659	4.112	8.251	6.888	4.025	9.433	5.575
3.49	2.213	2.504	2.915	1.565	0.513	9.274	4.387	1.962	9.988
3.817	2.909	4.035	1.346	5.672	8.603	5.243	3.241	6.851	4.988
2.388	2.724	2.702	2.058	0.455	7.927	2.297	5.605	5.46	3.619
0.381	3.007	0.335	2.623	2.791	2.52	9.865	4.216	5.144	5.917
2.381	0.433	0.944	1.711	4.173					
0.472	1.405	2.087	3.466	1.863					

(c) P. M. Shankar



Confusion Matrix: Threshold (intersection) = 4.275

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	1	39
	Target Present	22	8
	Total Counts	23	47

dist to top left corner of the ROC curve = 0.268

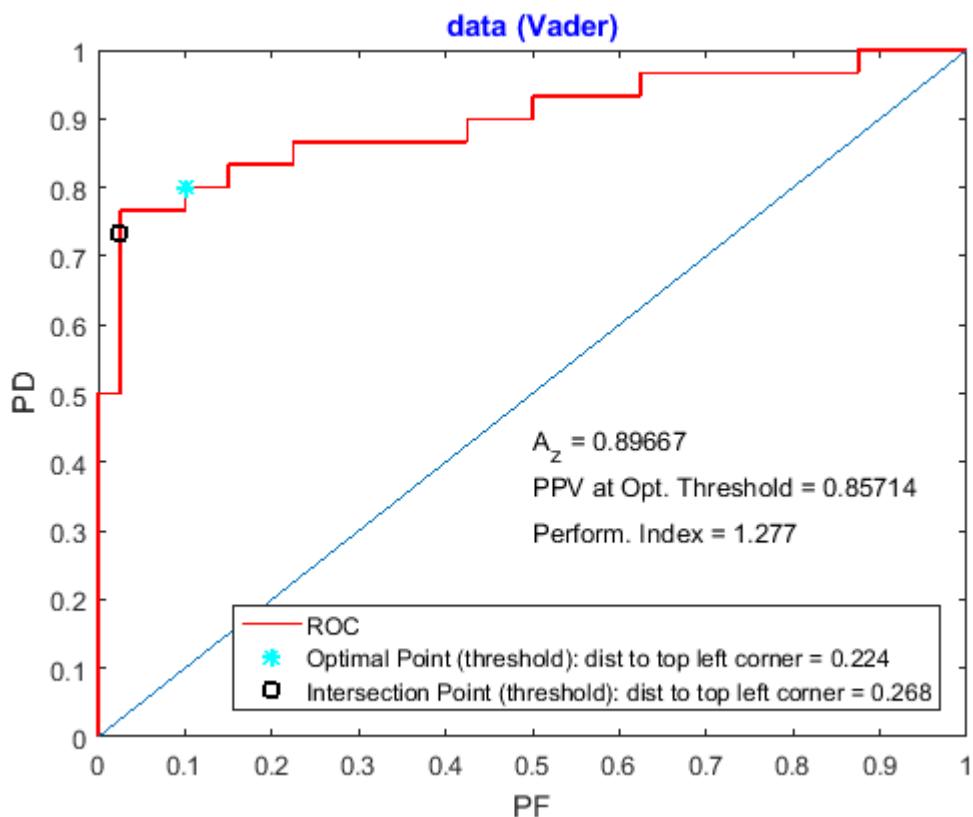
Transition Matrix: Threshold (intersection) = 4.275

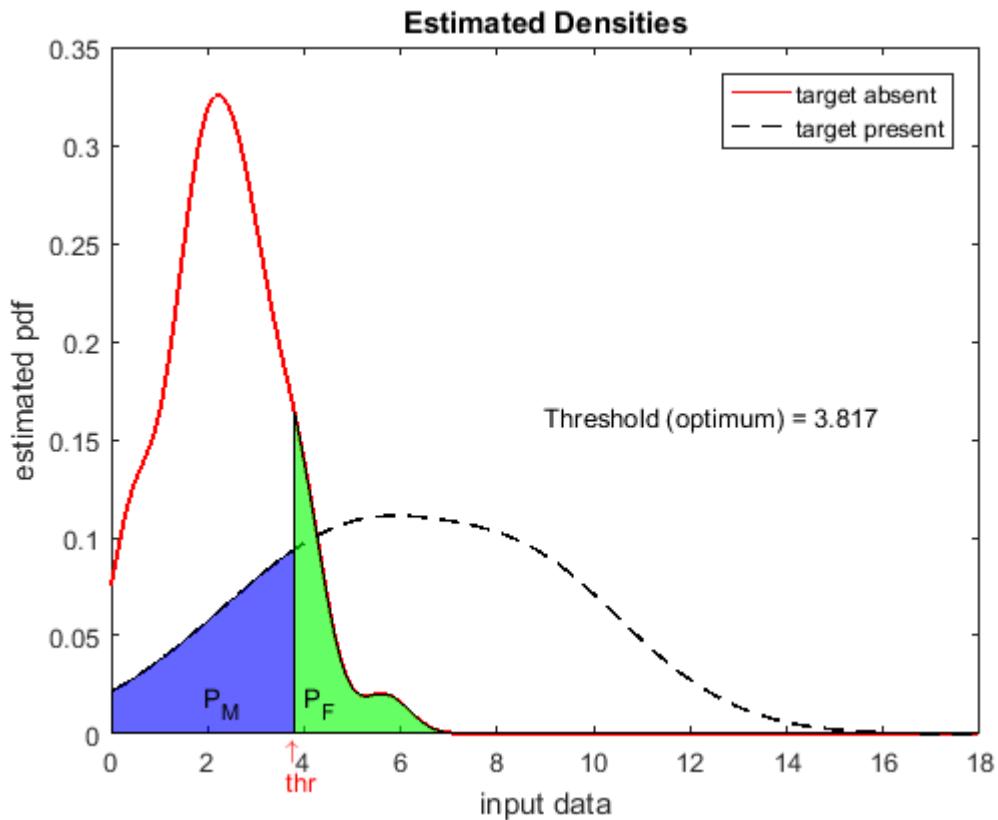
$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{39}{40} & \frac{4}{15} \\ \frac{1}{40} & \frac{11}{15} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.975 & 0.26667 \\ 0.025 & 0.7333 \end{bmatrix}$$

$$P_F = \frac{1}{40} = 0.025 \quad P_M = \frac{4}{15} = 0.26667 \quad \text{PPV} = \frac{22}{23} = 0.95652$$

p m shankar





Confusion Matrix : Threshold (optimum) = 3.817

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	4	36
	Target Present	24	6
	Total Counts	28	42

dist to top left corner of the ROC curve = 0.224

Transition Matrix: Threshold (optimum) = 3.817

$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{9}{10} & \frac{1}{5} \\ \frac{1}{10} & \frac{4}{5} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.9 & 0.2 \\ 0.1 & 0.8 \end{bmatrix}$$

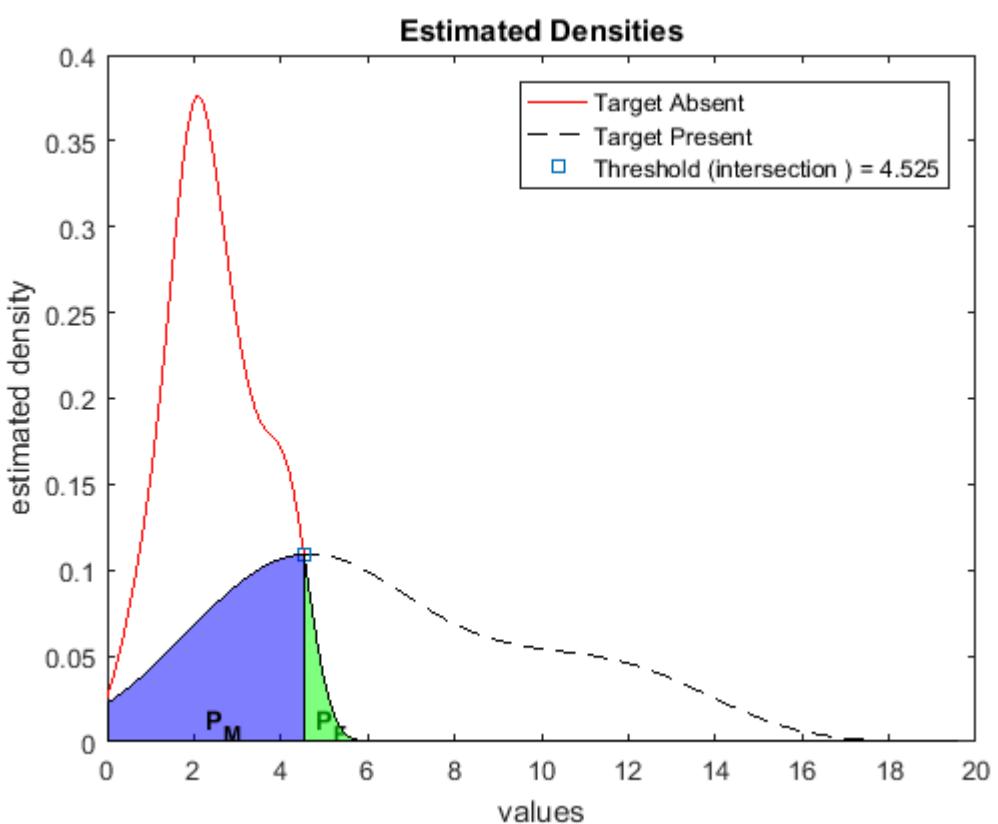
$$P_F = \frac{1}{10} = 0.1 \quad P_M = \frac{1}{5} = 0.2 \quad \text{PPV} = \frac{6}{7} = 0.85714$$

p m shankar

data (Wan)

Target Absent					Target Present				
1.821	1.267	2.996	4.447	1.143	4.203	4.192	12.822	13.092	6.199
1.969	1.416	2.217	1.729	4.376	5.619	1.487	10.924	2.302	6.337
2.572	1.933	3.634	2.365	4.132	4.511	8.117	6.307	4.109	9.364
3.108	1.637	0.679	2.033	2.733	6.284	5.601	6.158	11.909	2.227
1.505	3.497	2.822	2.843	2.158	9.359	2.916	4.996	10.67	3.315
1.945	2.35	3.244	2.149	0.966	2.947	3.983	8.735	12.424	3.919
4.043	1.986	4.085	4.207	2.908					
2.363	2.084	1.946	0.442	3.725					

(c) P. M. Shankar



Confusion Matrix: Threshold (intersection) = 4.525

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	0	40
	Target Present	18	12
	Total Counts	18	52

dist to top left corner of the ROC curve = 0.4

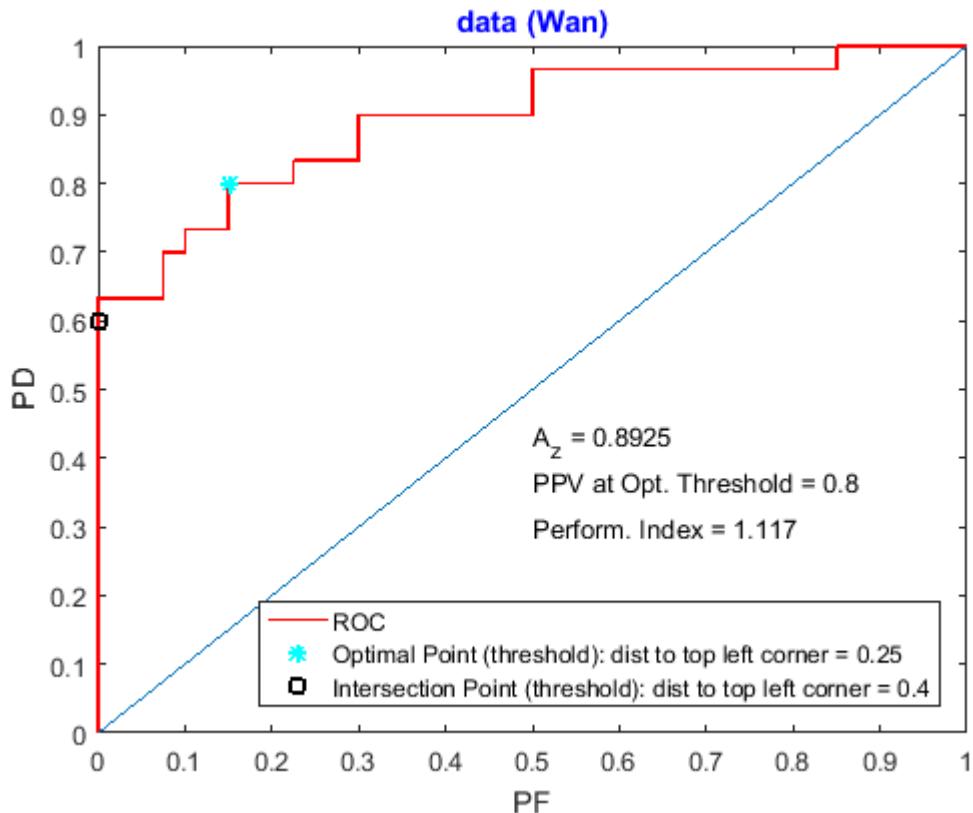
Transition Matrix: Threshold (intersection) = 4.525

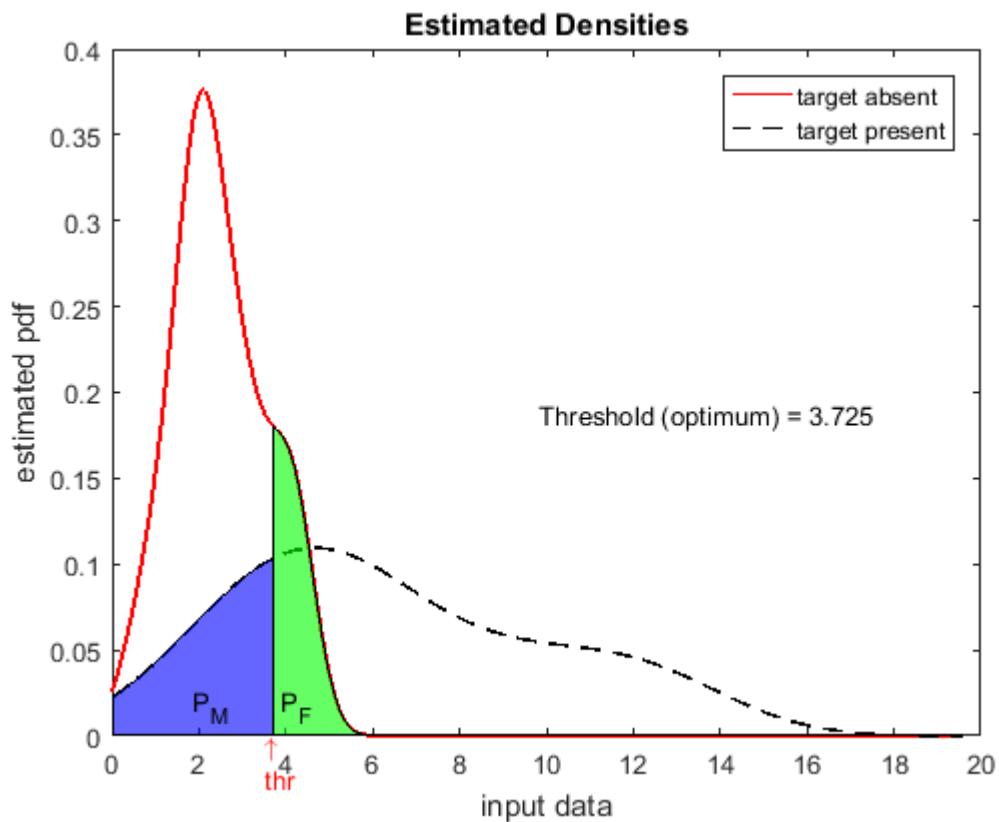
$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} 1 & \frac{2}{5} \\ 0 & \frac{3}{5} \end{bmatrix} \Rightarrow \begin{bmatrix} 1 & 0.4 \\ 0 & 0.6 \end{bmatrix}$$

$$P_F = 0 = 0 \quad P_M = \frac{2}{5} = 0.4 \quad \text{PPV} = 1 = 1$$

p m shankar





Confusion Matrix : Threshold (optimum) = 3.725

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	6	34
	Target Present	24	6
	Total Counts	30	40

dist to top left corner of the ROC curve = 0.25

Transition Matrix: Threshold (optimum) = 3.725

$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{17}{20} & \frac{1}{5} \\ \frac{3}{20} & \frac{4}{5} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.85 & 0.2 \\ 0.15 & 0.8 \end{bmatrix}$$

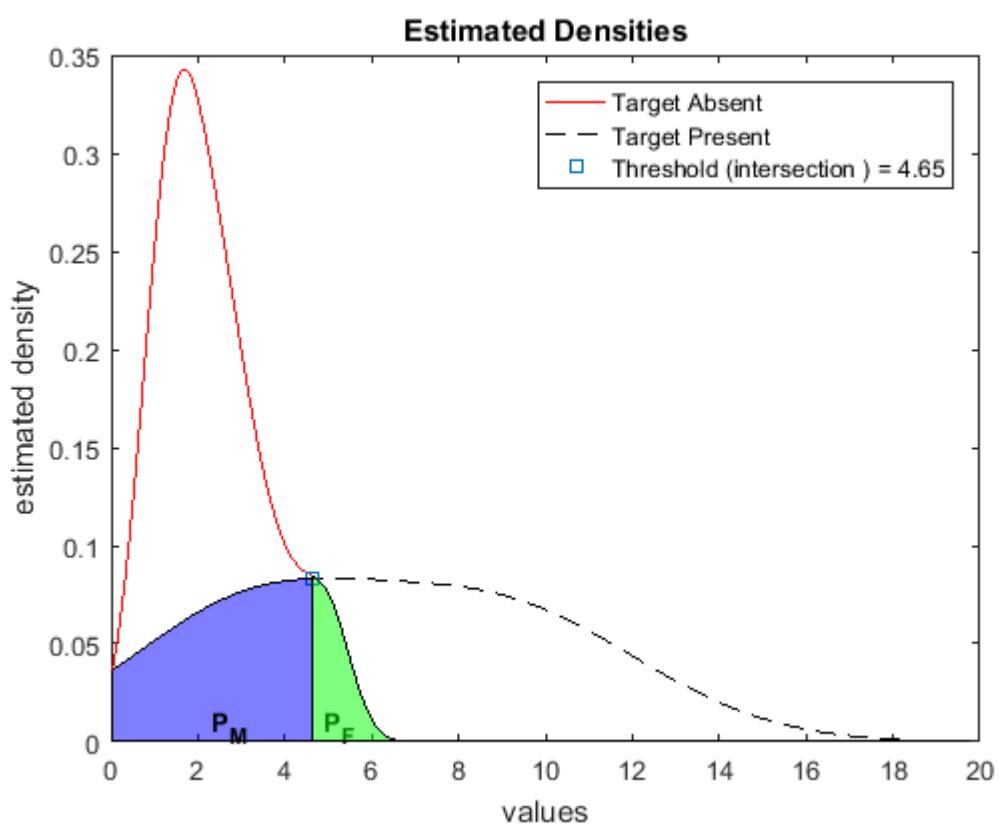
$$P_F = \frac{3}{20} = 0.15 \quad P_M = \frac{1}{5} = 0.2 \quad \text{PPV} = \frac{4}{5} = 0.8$$

p m shankar

data (Weinberger)

Target Absent					Target Present				
3.602	3.871	4.53	1.33	3.561	7.329	2.214	3.7	4.28	2.625
2.098	1.985	0.624	1.206	1.812	2.669	5.002	6.725	8.79	9.603
1.853	3.106	2.672	1.022	2.598	2.301	4.2	8.552	4.972	2.837
5.149	2.198	1.159	1.746	0.992	2.057	6.046	7.359	8.166	10.611
4.094	2.681	4.926	2.291	5.026	7.576	3.958	13.196	10.6	1.223
1.269	1.62	1.531	0.817	0.835	10.336	2.404	9.588	11.363	9.747
1.422	2.064	1.476	2.738	1.696					
2.154	2.665	1.572	3.056	3.034					

(c) P. M. Shankar



Confusion Matrix: Threshold (intersection) = 4.65

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	3	37
	Target Present	18	12
	Total Counts	21	49

dist to top left corner of the ROC curve = 0.407

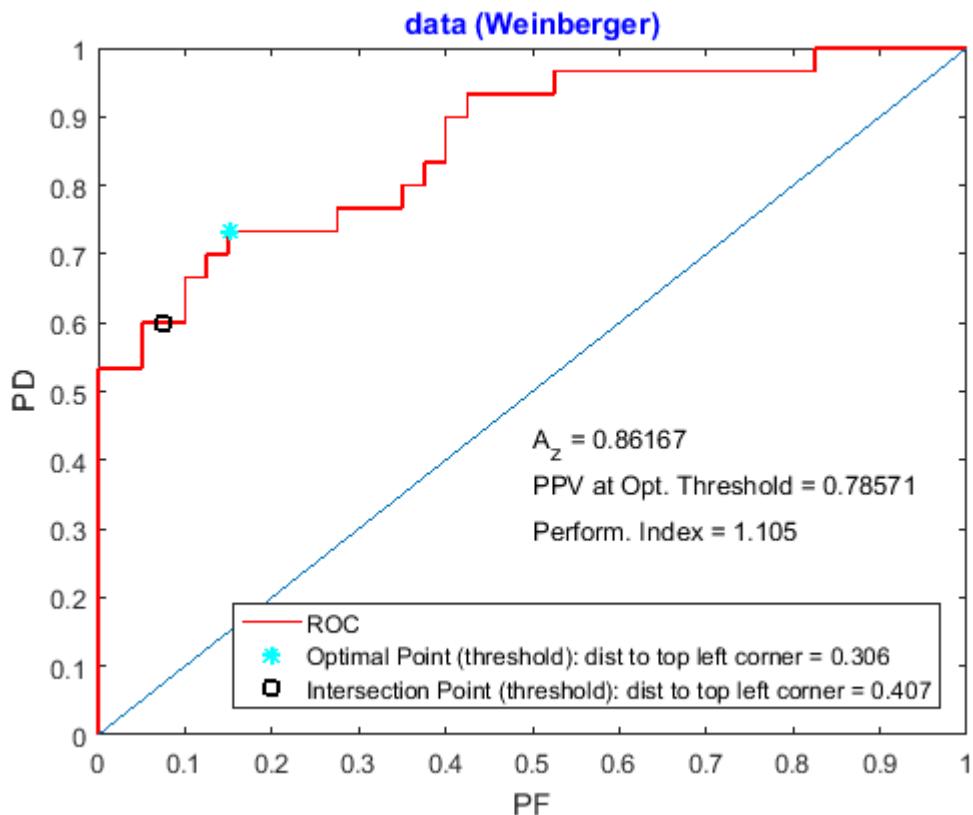
Transition Matrix: Threshold (intersection) = 4.65

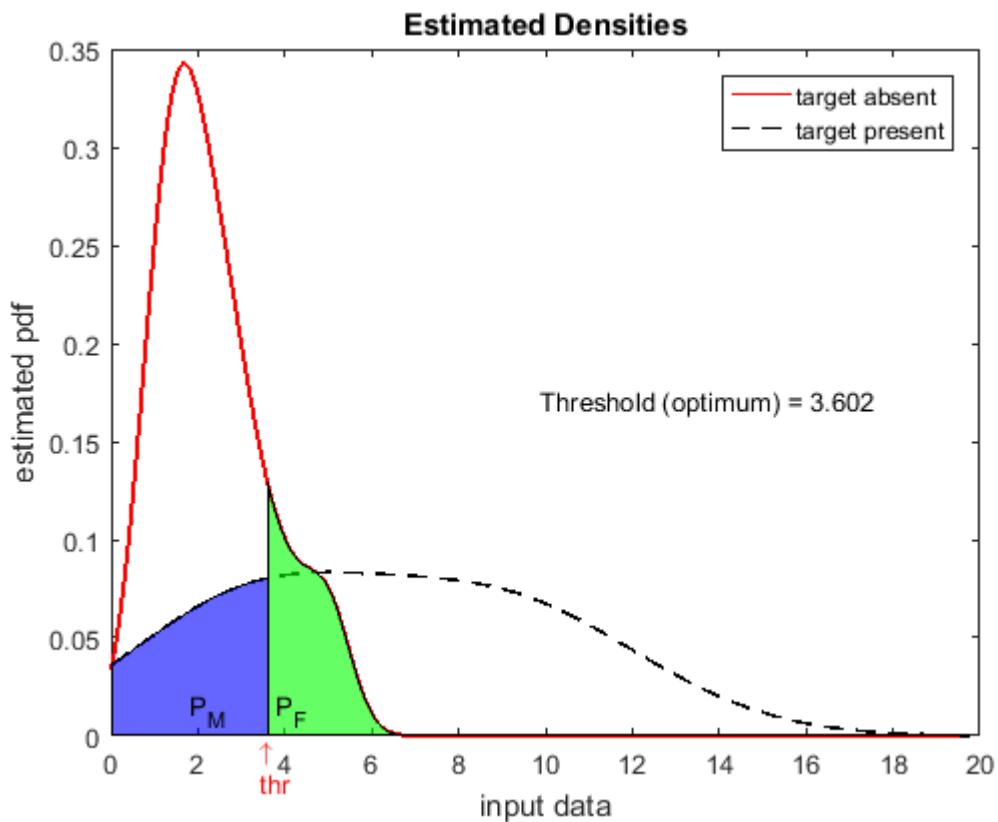
$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{37}{40} & \frac{2}{5} \\ \frac{3}{40} & \frac{3}{5} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.925 & 0.4 \\ 0.075 & 0.6 \end{bmatrix}$$

$$P_F = \frac{3}{40} = 0.075 \quad P_M = \frac{2}{5} = 0.4 \quad \text{PPV} = \frac{6}{7} = 0.85714$$

p m shankar





Confusion Matrix : Threshold (optimum) = 3.602

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	6	34
	Target Present	22	8
	Total Counts	28	42

dist to top left corner of the ROC curve = 0.306

Transition Matrix: Threshold (optimum) = 3.602

$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{17}{20} & \frac{4}{15} \\ \frac{3}{20} & \frac{11}{15} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.85 & 0.2667 \\ 0.15 & 0.7333 \end{bmatrix}$$

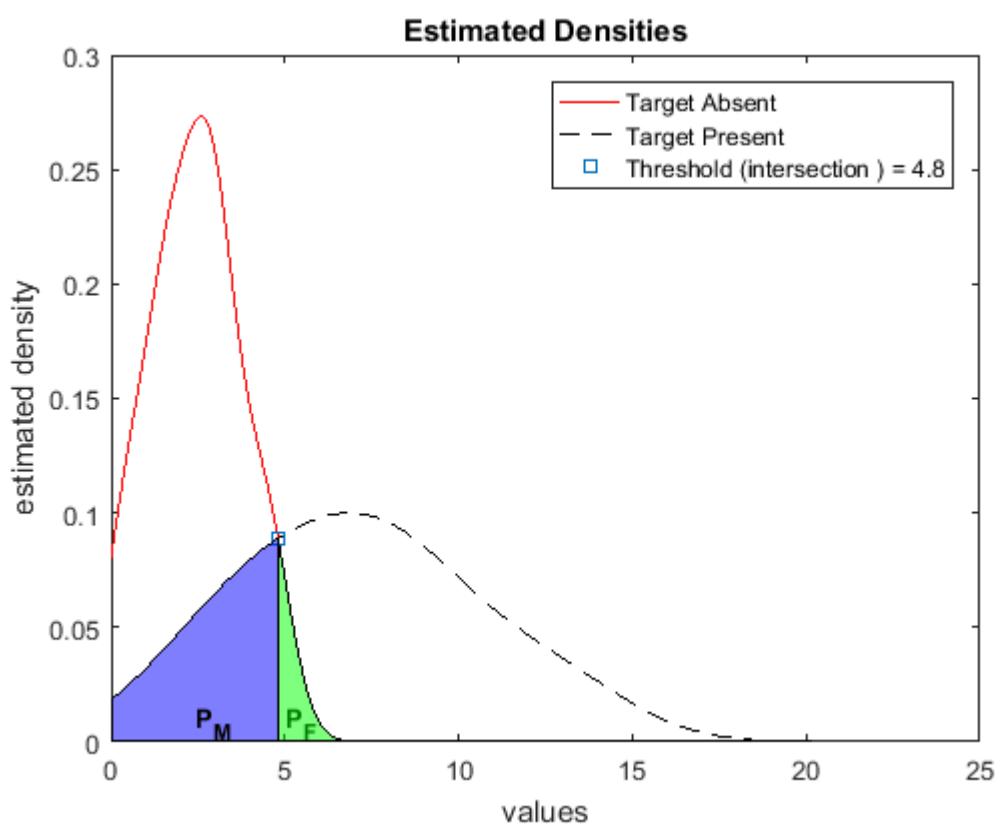
$$P_F = \frac{3}{20} = 0.15 \quad P_M = \frac{4}{15} = 0.26667 \quad \text{PPV} = \frac{11}{14} = 0.78571$$

p m shankar

data (Wojdylo)

Target Absent					Target Present				
4.579	2.681	1.909	2.367	4.252	8.291	4.247	12.746	5.769	9.869
1.957	4.415	2.874	2.526	1.411	4.417	8.697	7.98	13.321	10.117
5.029	1.29	0.737	0.323	1.412	5.847	2.627	6.961	7.633	10.612
2.632	2.614	2.974	0.381	3.148	4.268	8.821	12.017	3.857	7.231
4.593	3.762	3.341	3.051	0.195	13.436	7.048	1.452	2.251	2.772
2.254	2.939	1.803	0.203	1.688	4.652	8.412	5.601	8.1	5.864
2.962	1.799	4.212	2.897	1.902					
1.652	3.099	3.58	1.034	0.951					

(c) P. M. Shankar



Confusion Matrix: Threshold (intersection) = 4.8

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	1	39
	Target Present	21	9
	Total Counts	22	48

dist to top left corner of the ROC curve = 0.301

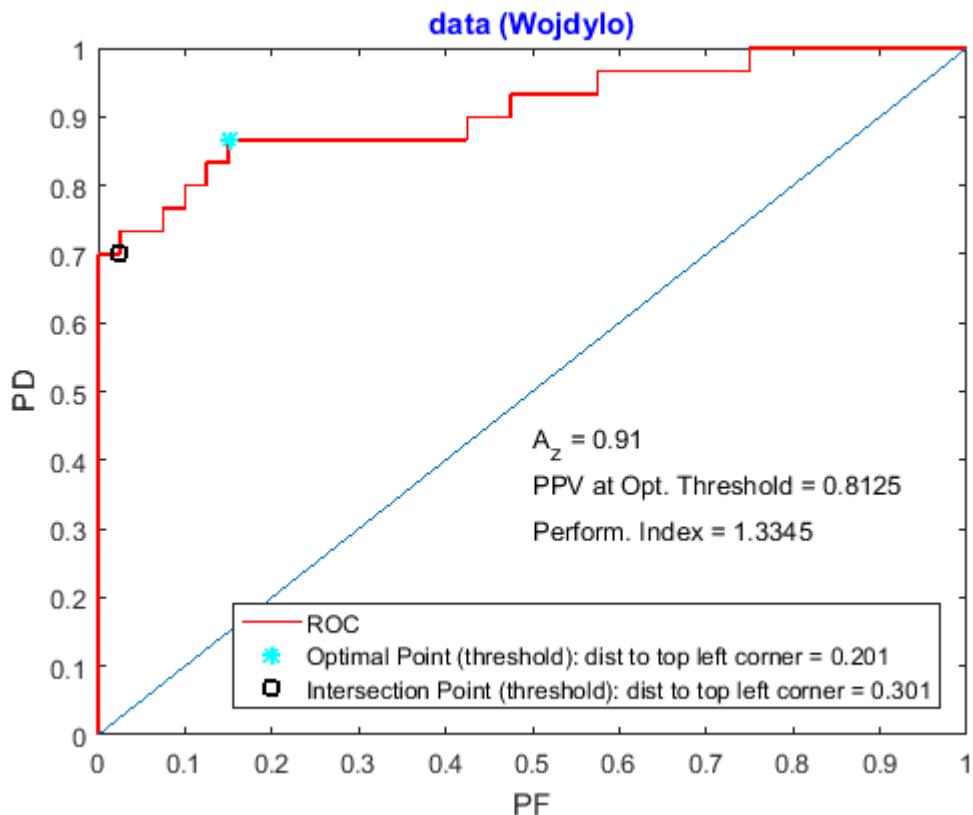
Transition Matrix: Threshold (intersection) = 4.8

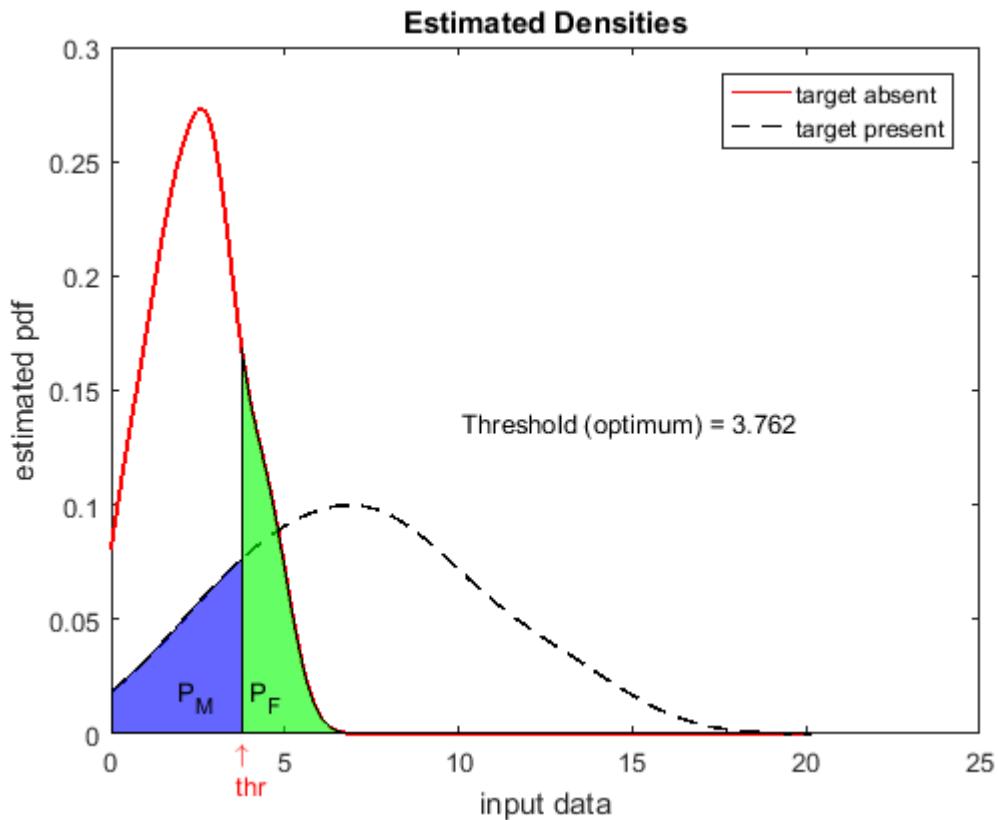
$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{39}{40} & \frac{3}{10} \\ \frac{1}{40} & \frac{7}{10} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.975 & 0.3 \\ 0.025 & 0.7 \end{bmatrix}$$

$$P_F = \frac{1}{40} = 0.025 \quad P_M = \frac{3}{10} = 0.3 \quad \text{PPV} = \frac{21}{22} = 0.95455$$

p m shankar





Confusion Matrix : Threshold (optimum) = 3.762

Data Collected		Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	6	34	40
	Target Present	26	4	30
	Total Counts	32	38	70

dist to top left corner of the ROC curve = 0.201

Transition Matrix: Threshold (optimum) = 3.762

$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{17}{20} & \frac{2}{15} \\ \frac{3}{20} & \frac{13}{15} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.85 & 0.1333 \\ 0.15 & 0.8667 \end{bmatrix}$$

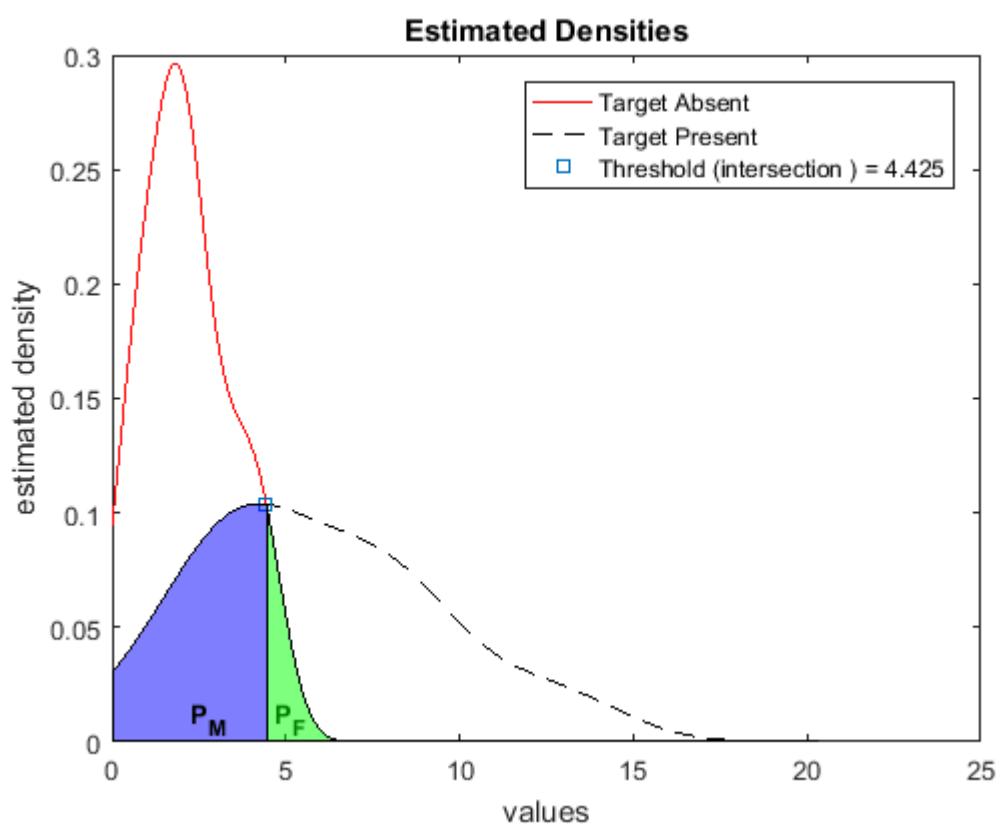
$$P_F = \frac{3}{20} = 0.15 \quad P_M = \frac{2}{15} = 0.1333 \quad \text{PPV} = \frac{13}{16} = 0.8125$$

p m shankar

data (Yang)

Target Absent					Target Present				
3.778	4.404	0.807	1.45	1.449	2.982	13.568	9.818	5.966	3.722
3.411	0.764	1.914	0.614	0.453	3.169	6.286	1.355	4.545	4.25
1.373	4.087	3.708	3.052	4.308	8.7	7.738	4.065	2.96	6.984
1.803	1.243	1.762	2.215	0.709	6.839	11.934	7.568	4.772	4.634
2.41	1.862	1.742	4.917	2.65	2.602	7.452	8.391	12.8	3.302
0.821	3.552	0.204	2.214	0.197	8.42	1.853	9.501	3.897	0.198
4.349	1.543	1.011	1.855	3.022					
2.546	2.385	2.108	1.937	2.42					

(c) P. M. Shankar



Confusion Matrix: Threshold (intersection) = 4.425

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	1	39
	Target Present	18	12
	Total Counts	19	51

dist to top left corner of the ROC curve = 0.401

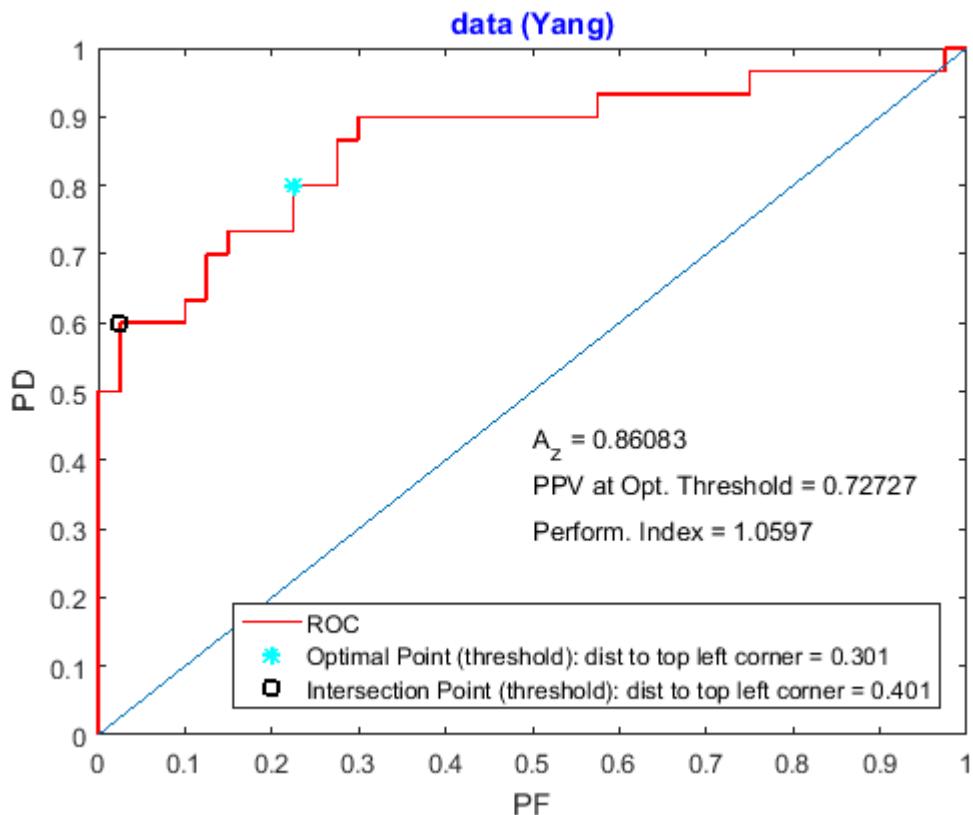
Transition Matrix: Threshold (intersection) = 4.425

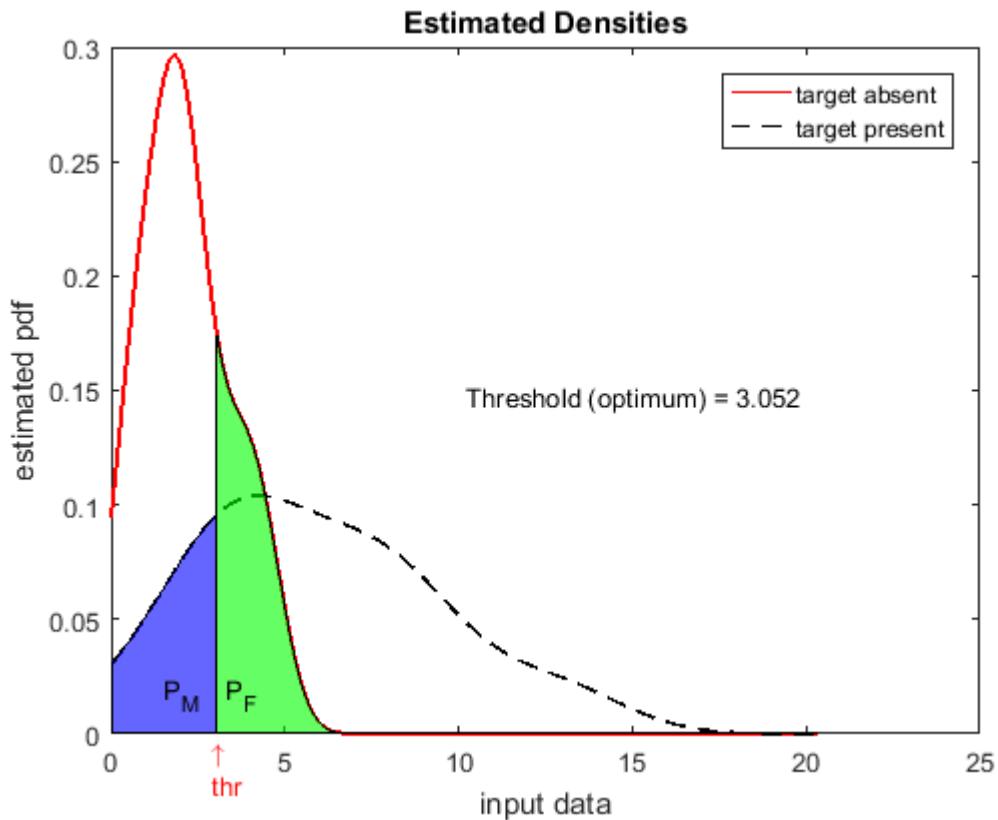
$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{39}{40} & \frac{2}{5} \\ \frac{1}{40} & \frac{3}{5} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.975 & 0.4 \\ 0.025 & 0.6 \end{bmatrix}$$

$$P_F = \frac{1}{40} = 0.025 \quad P_M = \frac{2}{5} = 0.4 \quad \text{PPV} = \frac{18}{19} = 0.94737$$

p m shankar





Confusion Matrix : Threshold (optimum) = 3.052

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	9	31
	Target Present	24	6
	Total Counts	33	37

dist to top left corner of the ROC curve = 0.301

Transition Matrix: Threshold (optimum) = 3.052

$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{31}{40} & \frac{1}{5} \\ \frac{9}{40} & \frac{4}{5} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.775 & 0.2 \\ 0.225 & 0.8 \end{bmatrix}$$

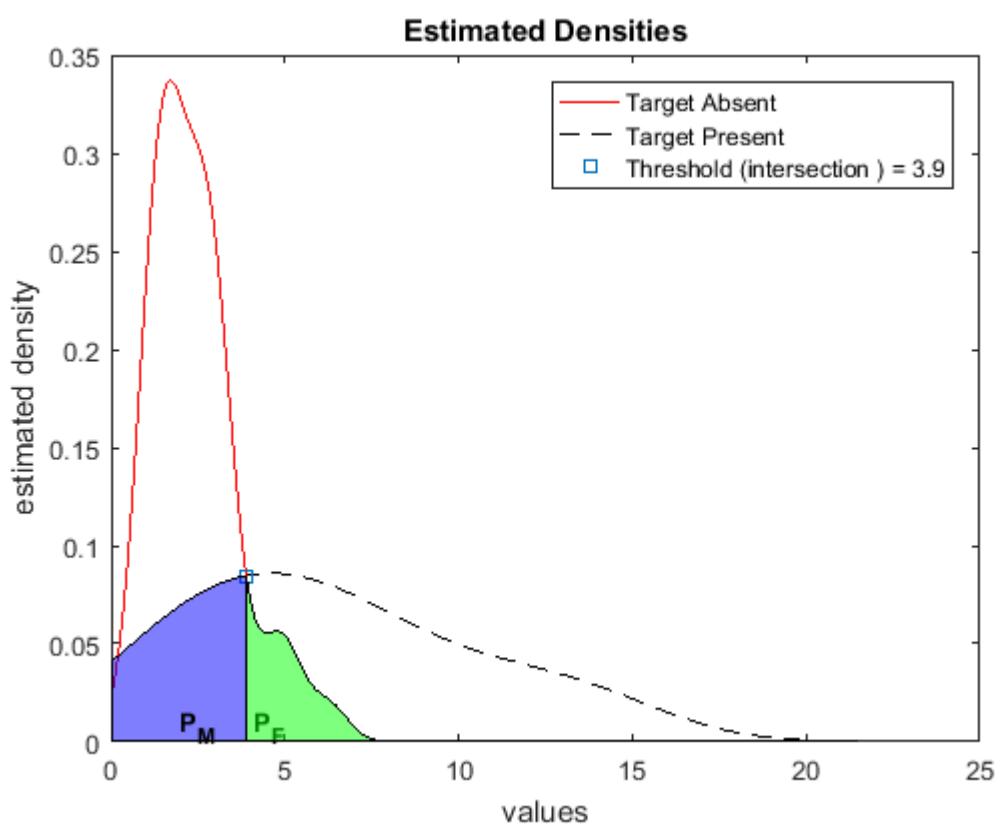
$$P_F = \frac{9}{40} = 0.225 \quad P_M = \frac{1}{5} = 0.2 \quad \text{PPV} = \frac{8}{11} = 0.72727$$

p m shankar

data (Yang)

Target Absent					Target Present				
1.333	2.814	1.409	0.719	1.967	2.49	12.488	4.148	8.545	11.427
1.701	5.157	1.557	1.064	1.81	14.337	0.279	13.573	5.023	2.476
1.299	3.148	2.768	1.166	2.673	6.124	5.21	8.807	2.26	9.921
3.369	1.369	1.652	1.279	6.276	4.675	4.357	1.21	3.456	5.868
2.009	1.006	2.089	2.641	3.03	5.042	7.453	10.437	2.411	7.505
2.94	2.493	1.364	2.812	1.87	7.024	6.198	1.523	1.433	13.92
2.746	2.51	2.093	3.002	3.857					
1.872	4.908	3.237	1.315	4.658					

(c) P. M. Shankar



Confusion Matrix: Threshold (intersection) = 3.9

Data Collected	Target Detected	Target Not Detected	Total Counts
Target Absent	4	36	40
Target Present	21	9	30
Total Counts	25	45	70

Errors circled

dist to top left corner of the ROC curve = 0.316

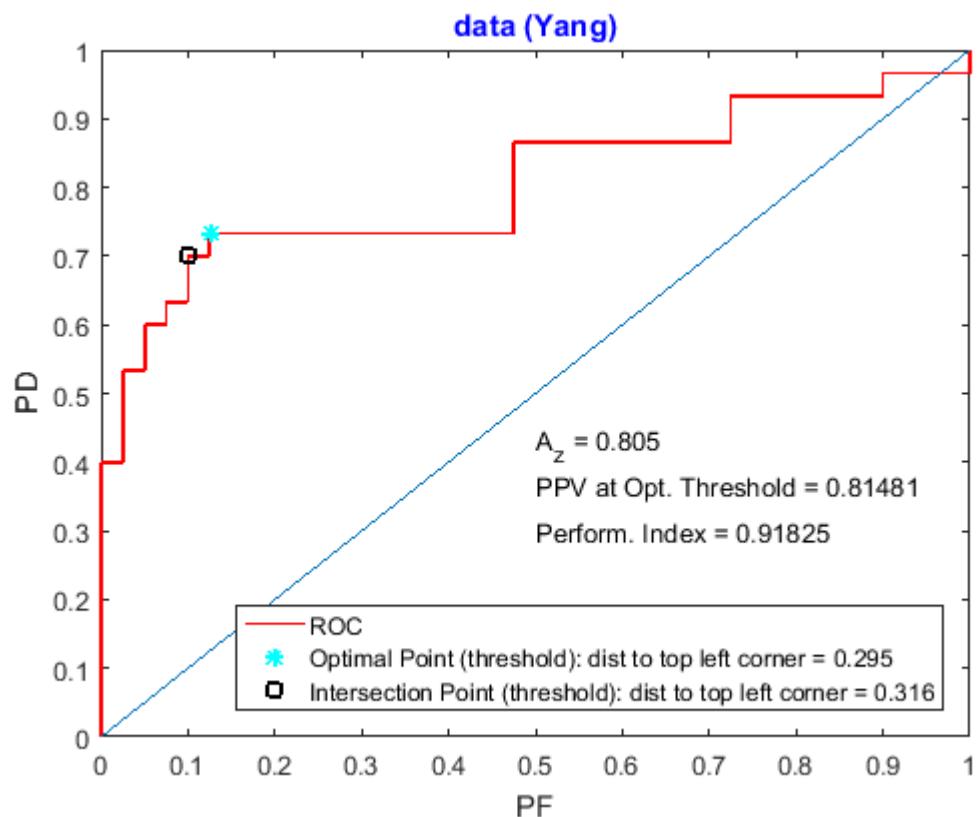
Transition Matrix: Threshold (intersection) = 3.9

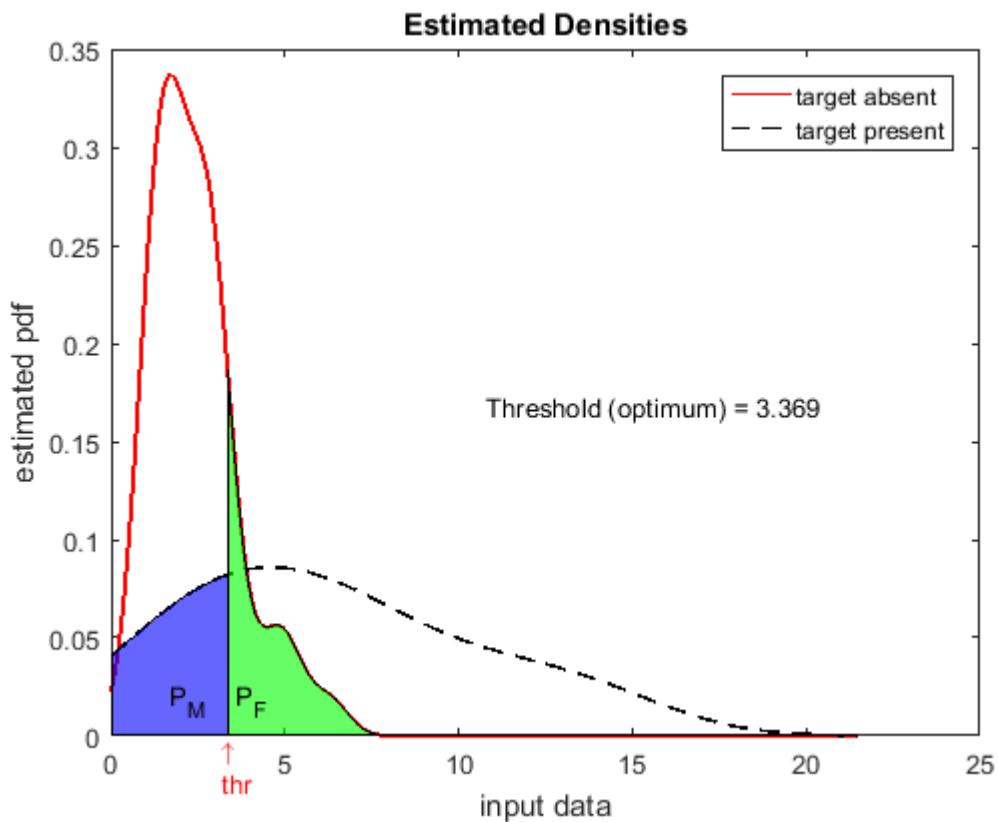
$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{9}{10} & \frac{3}{10} \\ \frac{1}{10} & \frac{7}{10} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.9 & 0.3 \\ 0.1 & 0.7 \end{bmatrix}$$

$$P_F = \frac{1}{10} = 0.1 \quad P_M = \frac{3}{10} = 0.3 \quad \text{PPV} = \frac{21}{25} = 0.84$$

p m shankar





Confusion Matrix : Threshold (optimum) = 3.369

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	5	35
	Target Present	22	8
	Total Counts	27	43

dist to top left corner of the ROC curve = 0.295

Transition Matrix: Threshold (optimum) = 3.369

$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{7}{8} & \frac{4}{15} \\ \frac{1}{8} & \frac{11}{15} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.875 & 0.2667 \\ 0.125 & 0.7333 \end{bmatrix}$$

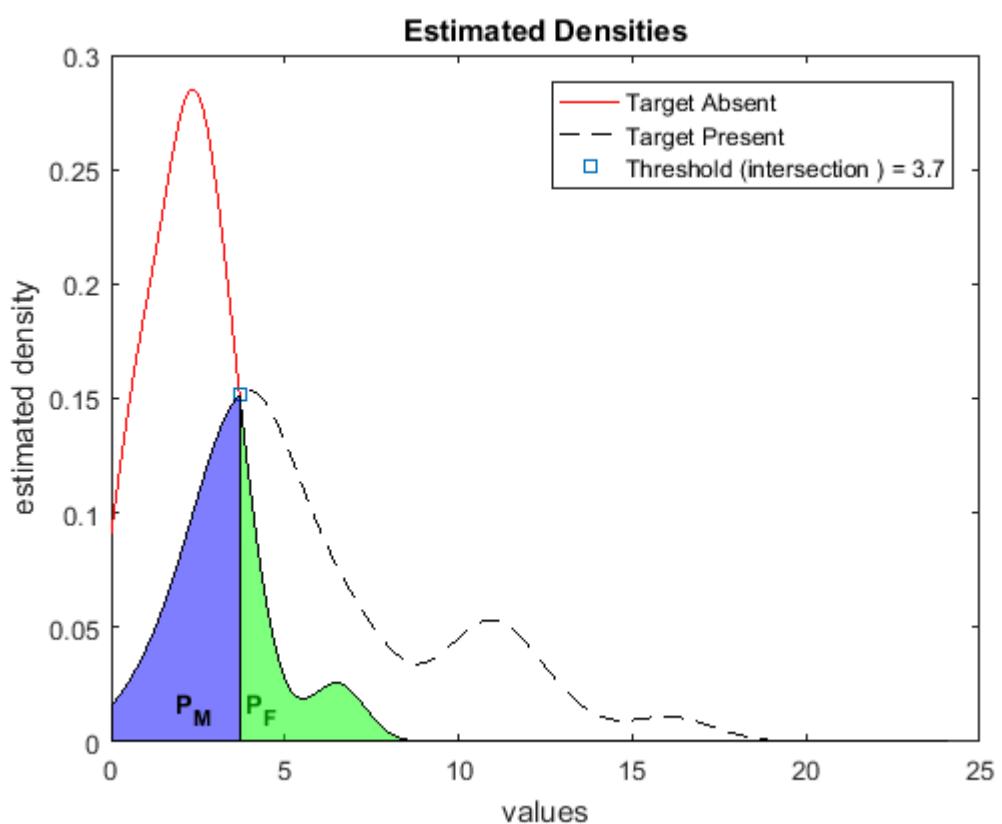
$$P_F = \frac{1}{8} = 0.125 \quad P_M = \frac{4}{15} = 0.26667 \quad \text{PPV} = \frac{22}{27} = 0.81481$$

p m shankar

data (Zhong)

Target Absent					Target Present				
6.828	3.223	3.839	2.861	1.845	1.009	16.096	10.674	3.407	10.742
2.157	2.361	2.043	0.049	3.208	5.475	3.719	5.562	11.083	7.272
3.153	2.222	4.47	0.881	0.459	6.941	6.38	2.959	7.503	4.351
3.805	2.103	2.04	2.698	3.04	3.258	4.82	11.495	2.449	4.092
2.893	6.179	2.38	0.306	1.269	9.901	12.723	4.572	3.29	3.483
2.405	2.729	2.147	1.132	1.226	4.876	4.185	3.258	1.692	4.319
0.647	3.659	0.81	1.822	3.408					
0.881	0.578	2.676	1.997	1.934					

(c) P. M. Shankar



Confusion Matrix: Threshold (intersection) = 3.7

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	5	35
	Target Present	21	9
	Total Counts	26	44

dist to top left corner of the ROC curve = 0.325

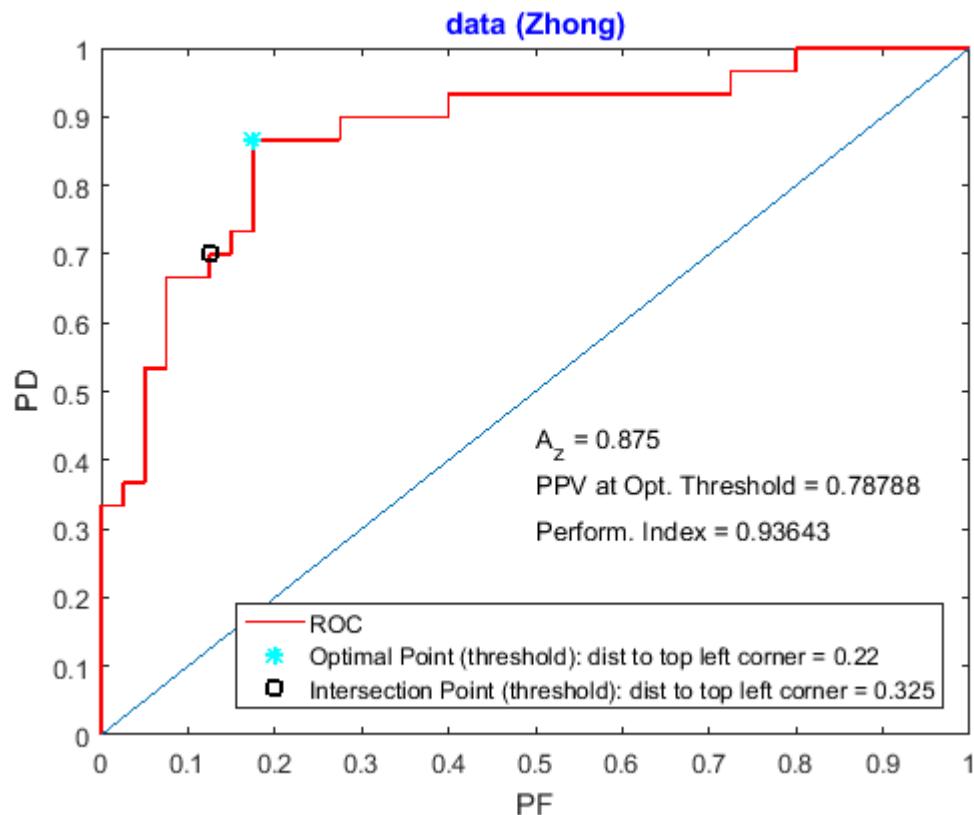
Transition Matrix: Threshold (intersection) = 3.7

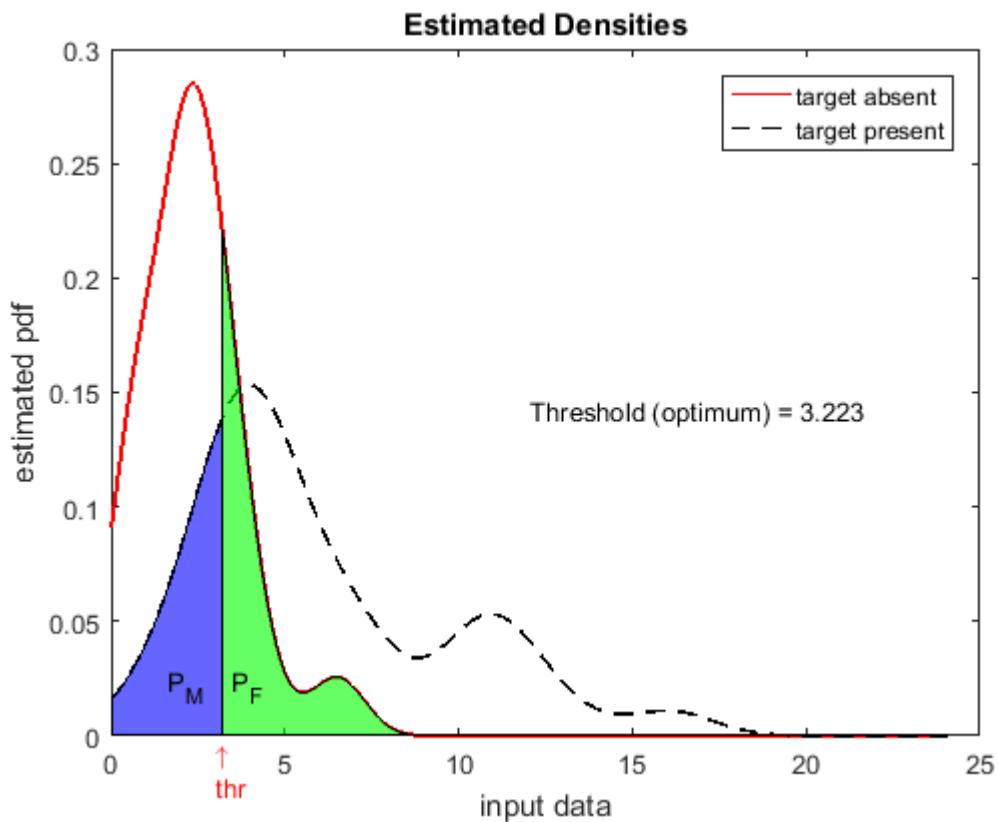
$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{7}{8} & \frac{3}{10} \\ \frac{1}{8} & \frac{7}{10} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.875 & 0.3 \\ 0.125 & 0.7 \end{bmatrix}$$

$$P_F = \frac{1}{8} = 0.125 \quad P_M = \frac{3}{10} = 0.3 \quad \text{PPV} = \frac{21}{26} = 0.80769$$

p m shankar





Confusion Matrix : Threshold (optimum) = 3.223

Data Collected	Target Detected	Target Not Detected	Total Counts
Errors circled	Target Absent	7	33
	Target Present	26	4
	Total Counts	33	37

dist to top left corner of the ROC curve = 0.22

Transition Matrix: Threshold (optimum) = 3.223

$$T_X = \begin{bmatrix} P(\text{Not Detected}|\text{Absent}) & P(\text{Not Detected}|\text{Present}) \\ P(\text{Detected}|\text{Absent}) & P(\text{Detected}|\text{Present}) \end{bmatrix}$$

$$T_X = \begin{bmatrix} 1 - P_F & P_M \\ P_F & 1 - P_M \end{bmatrix} \Rightarrow \begin{bmatrix} \frac{33}{40} & \frac{2}{15} \\ \frac{7}{40} & \frac{13}{15} \end{bmatrix} \Rightarrow \begin{bmatrix} 0.825 & 0.1333 \\ 0.175 & 0.8667 \end{bmatrix}$$

$$P_F = \frac{7}{40} = 0.175 \quad P_M = \frac{2}{15} = 0.1333 \quad \text{PPV} = \frac{26}{33} = 0.78788$$

p m shankar

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