

# Görüntü Segmentasyonu

İrem Kömürcü



# Hello Everyone!



## İrem Kömürcü

Computer Vision Engineer

[www.iremkomurcu.com](http://www.iremkomurcu.com)



[iremkomurcu](#)



[irem-komurcu](#)



[iremkomurcubm](#)

AI Specialist - Global AI Hub

HUG 19 - Fellow

Deep Learning Türkiye - Core Member

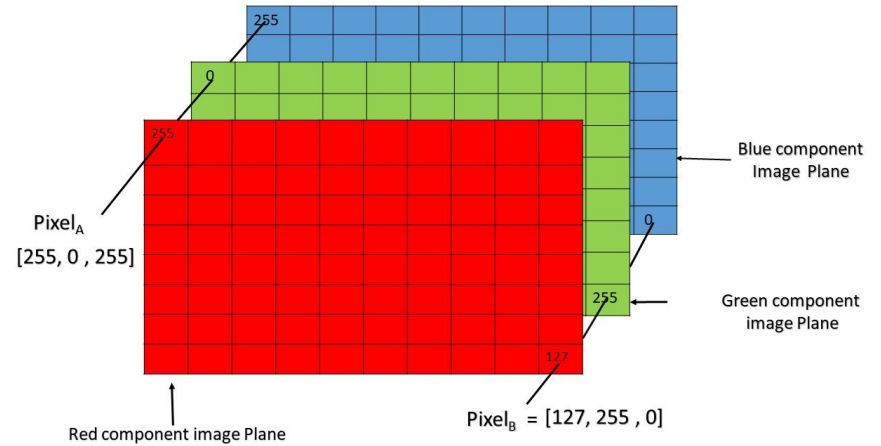
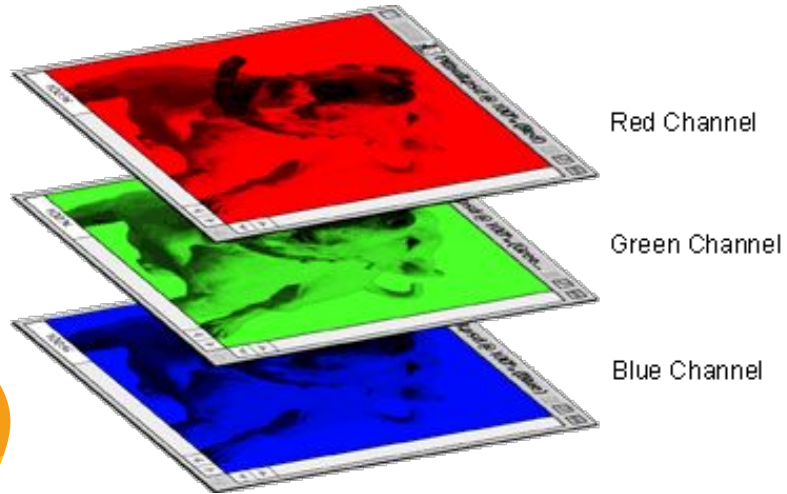
TensorFlow Turkey - Core Member

GDG & WTM İstanbul - Organizer

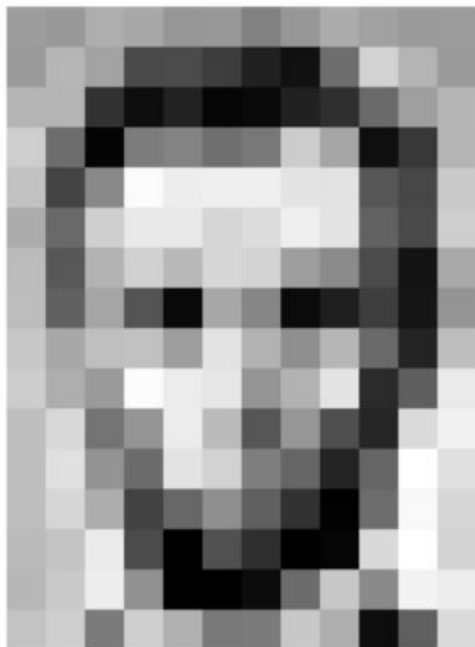


**PİXEL NEDİR?**

# Pixel ve Renk Kanalları



Pixel of an RGB image are formed from the corresponding pixel of the three component images

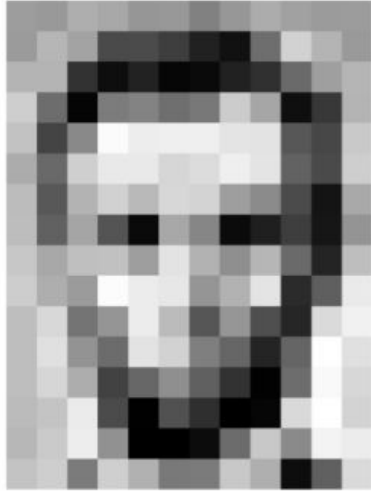


157	153	174	168	150	152	129	151	172	161	155	156
155	182	163	74	75	62	33	17	110	210	180	154
180	180	50	14	34	6	10	33	48	106	159	181
206	109	5	124	131	111	120	204	166	15	56	180
194	68	137	251	237	299	239	228	227	87	71	201
172	106	207	233	233	214	220	239	228	98	74	206
188	88	179	209	185	215	211	158	139	75	20	169
189	97	165	84	10	168	134	11	31	62	22	148
199	168	191	193	158	227	178	143	182	106	36	190
205	174	155	252	236	231	149	178	228	43	95	234
190	216	116	149	236	187	86	150	79	38	218	241
190	224	147	108	227	210	127	102	36	101	255	224
190	214	173	66	103	143	96	50	2	109	249	215
187	196	235	75	1	81	47	0	6	217	255	211
183	202	237	145	0	0	12	108	200	138	243	236
195	206	123	207	177	121	123	200	175	13	96	218

What the computer sees

157	153	174	168	150	152	129	151	172	161	155	156
155	182	163	74	75	62	33	17	110	210	180	154
180	180	50	14	34	6	10	33	48	106	159	181
206	109	5	124	131	111	120	204	166	15	56	180
194	68	137	251	237	239	239	228	227	87	71	201
172	106	207	233	233	214	220	239	228	98	74	206
188	88	179	209	185	215	211	158	139	75	20	169
189	97	165	84	10	168	134	11	31	62	22	148
199	168	191	193	158	227	178	143	182	106	36	190
205	174	155	252	236	231	149	178	228	43	95	234
190	216	116	149	236	187	86	150	79	38	218	241
190	224	147	108	227	210	127	102	36	101	255	224
190	214	173	66	103	143	96	50	2	109	249	215
187	196	235	75	1	81	47	0	6	217	255	211
183	202	237	145	0	0	12	108	200	138	243	236
195	206	123	207	177	121	123	200	175	13	96	218





Input Image



157	153	174	168	150	152	129	151	172	161	155	156
155	182	163	74	75	62	33	17	110	210	180	154
180	180	50	14	34	6	10	33	48	106	159	181
206	109	5	124	131	111	120	204	166	15	56	180
194	68	137	251	237	239	239	228	227	87	71	201
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199	168	191	193	158	227	178	143	182	106	36	190
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190	224	147	108	227	210	127	102	36	101	255	224
190	214	173	66	103	143	96	50	2	109	249	215
187	196	235	75	1	81	47	0	6	217	255	211
183	202	237	145	0	0	12	108	200	138	243	236
195	206	123	207	177	121	123	200	175	13	96	218

Pixel Representation



classification

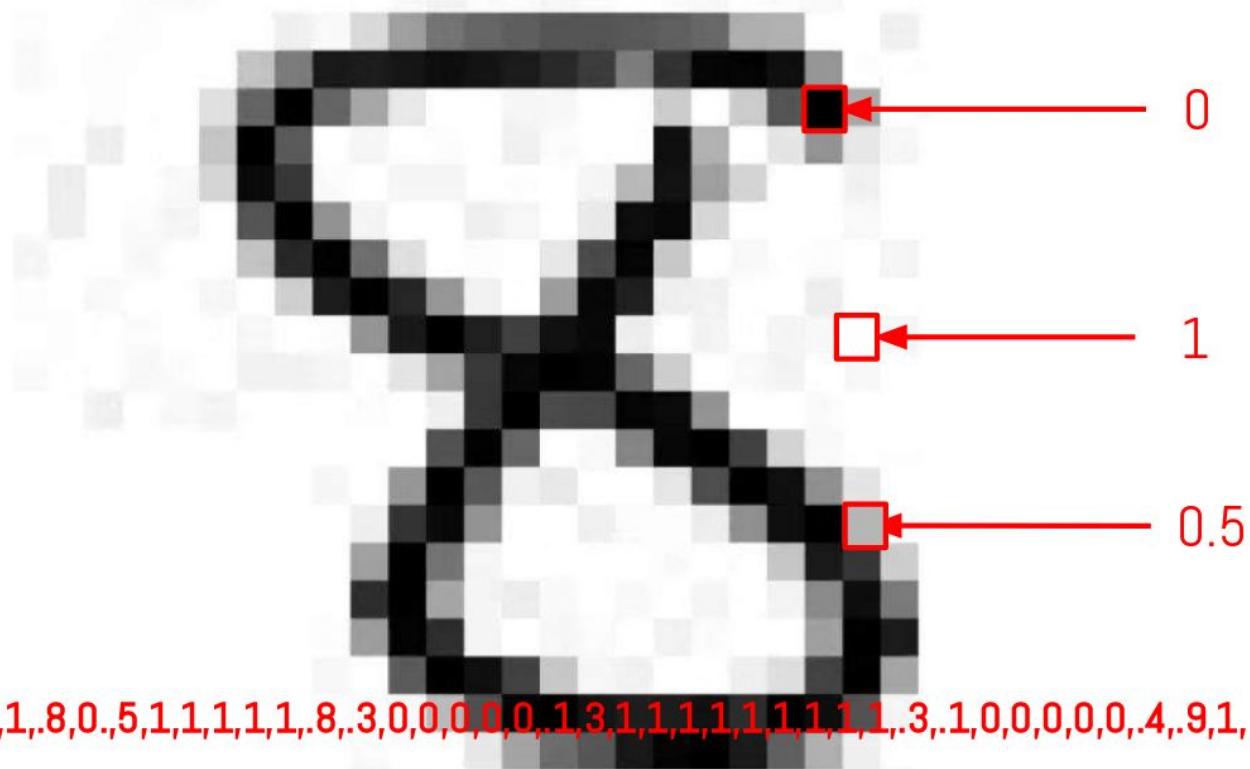
Lincoln

Washington

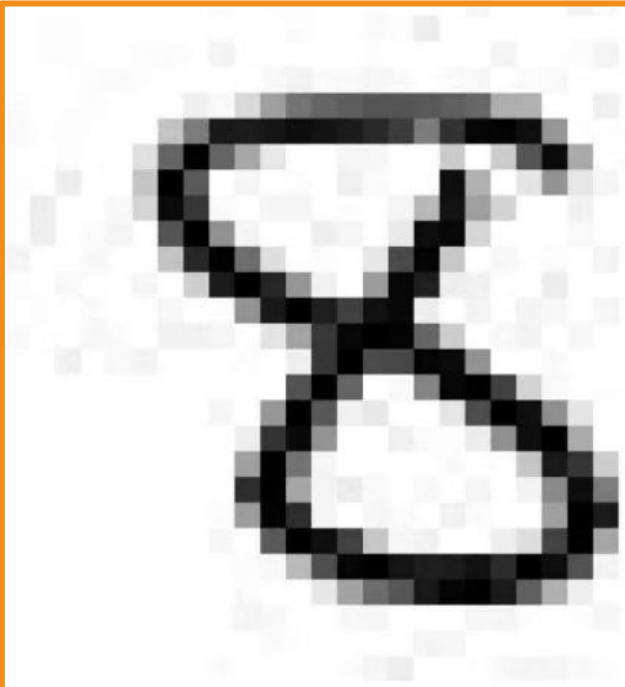
Jefferson

Obama

$$\begin{bmatrix} 0.8 \\ 0.1 \\ 0.05 \\ 0.05 \end{bmatrix}$$



(1,1,1,1,1,1,1,1,1,8,0,5,1,1,1,1,1,8,3,0,0,0,0,0,1,3,1,1,1,1,1,1,1,1,3,1,0,0,0,0,0,4,9,1, ... )




(1,1,1,1,1,1,1,1,1,8,0,5,1,1,1,...)

784 pixels → 784 dimensions







(1,1,1,1,1,1,1,1,**1**,**.8**,**0**,**.5**,**1**,1,1,... )

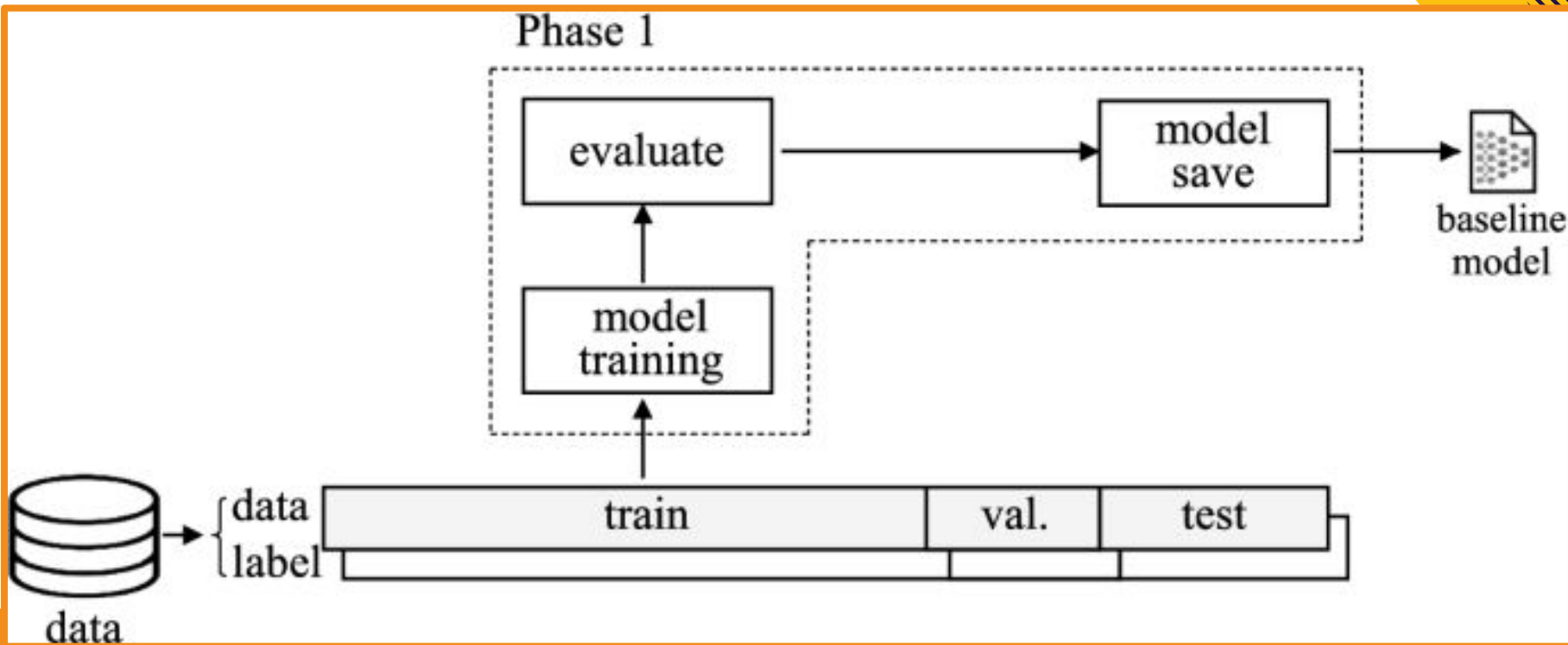


(1,1,1,1,1,1,1,1,**.6**,**.7**,**0**,**.4**,**1**,1,1,... )



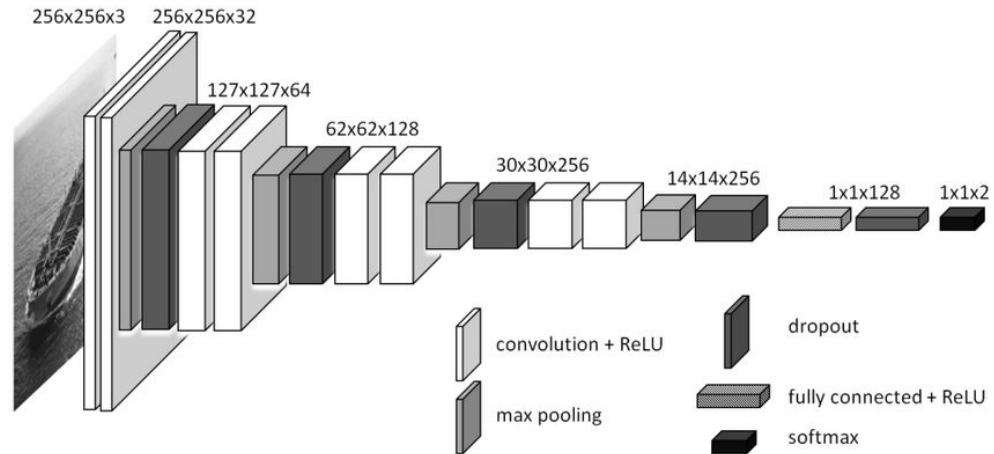
(1,1,1,1,1,1,1,1,**.4**,**.5**,**0**,**.3**,**.2**,1,1,... )

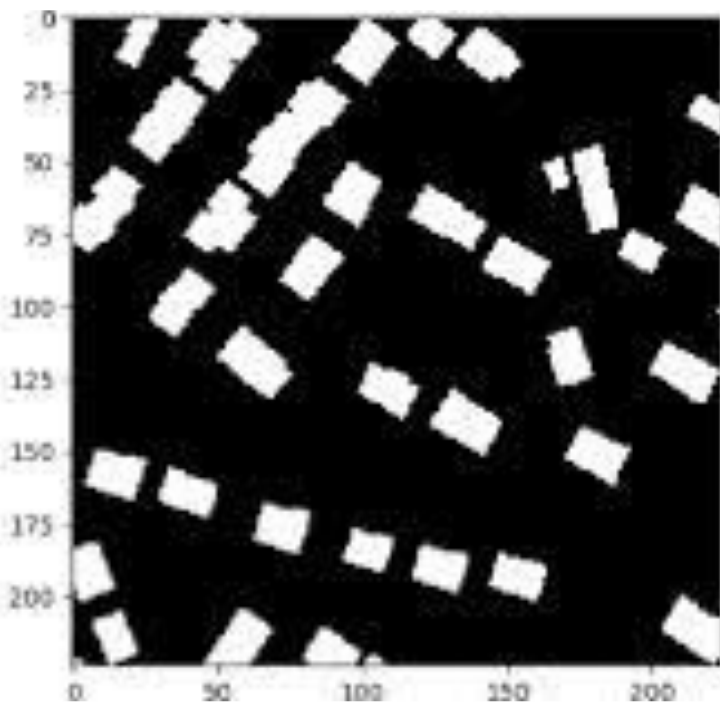
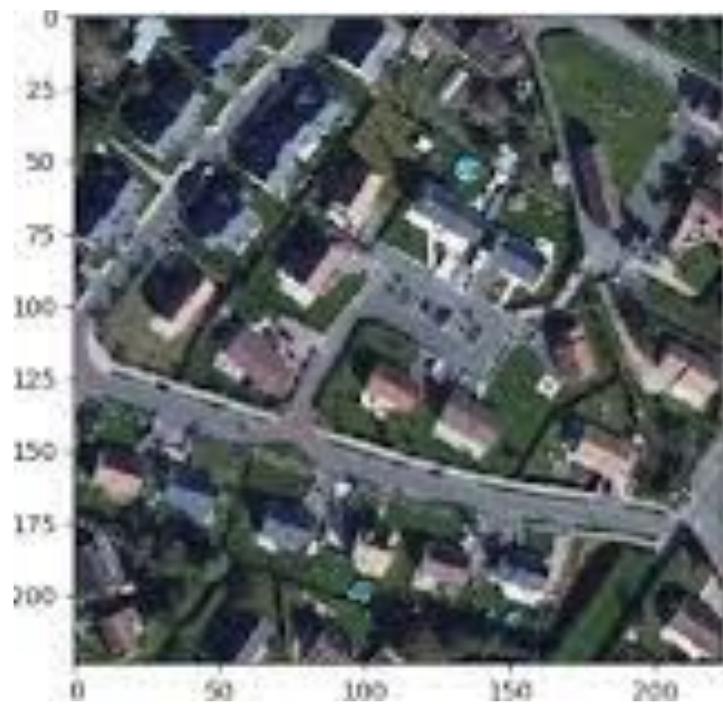
...

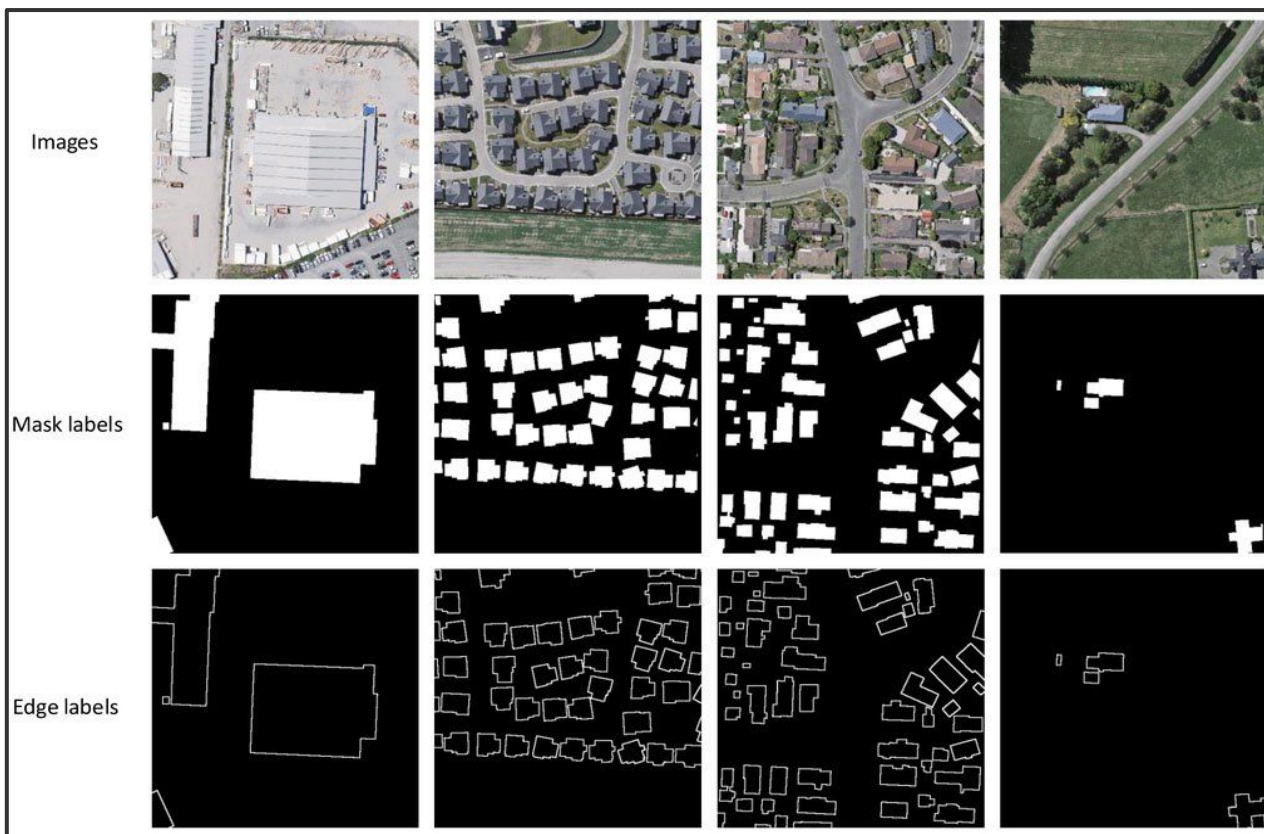


# Derin Öğrenme - Ağlar

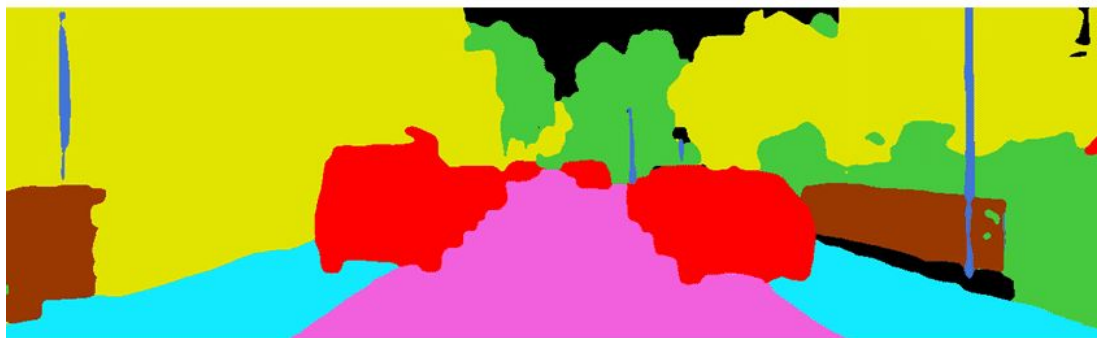
- Convolutional Neural Networks (CNNs)
- Long Short Term Memory Networks (LSTMs)
- Recurrent Neural Networks (RNNs)
- Generative Adversarial Networks (GANs)
- Radial Basis Function Networks (RBFNs)
- Multilayer Perceptrons (MLPs)
- Self Organizing Maps (SOMs)
- Deep Belief Networks (DBNs)
- Restricted Boltzmann Machines (RBMs)











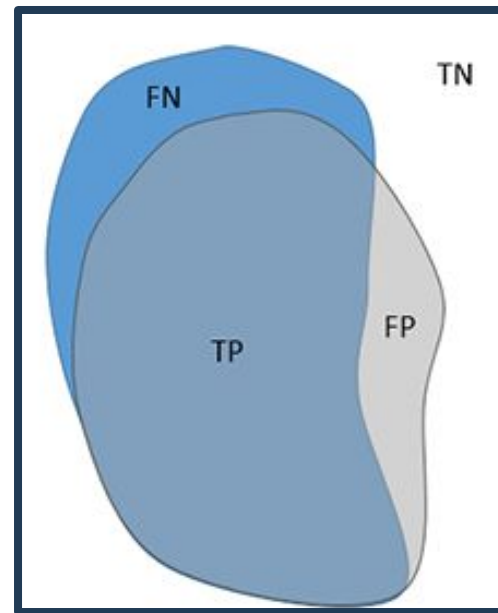
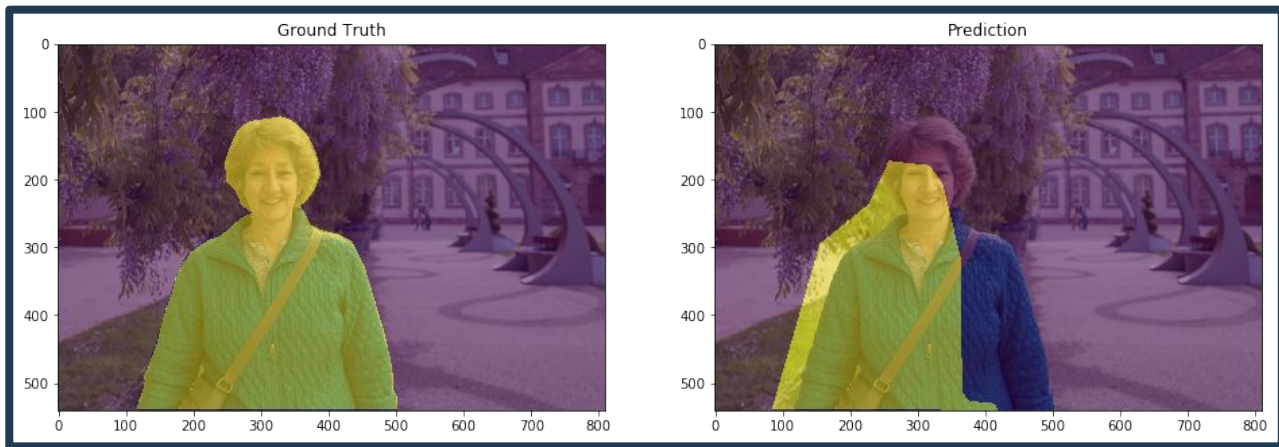


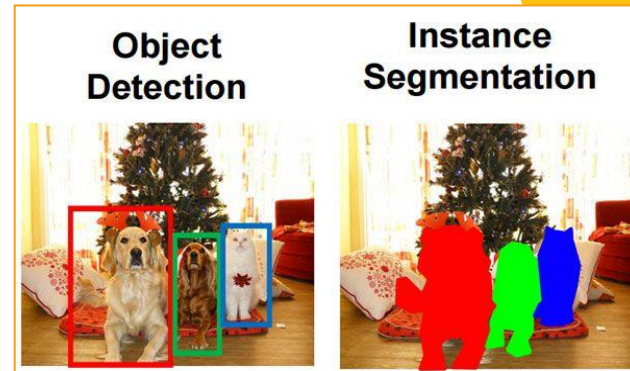
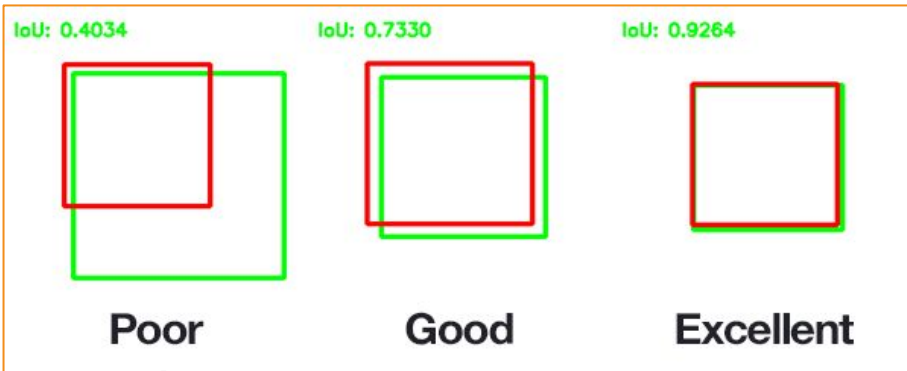






 Road	 Sidewalk	 Building	 Fence
 Pole	 Vegetation	 Vehicle	 Unlabel





$$\text{IoU} = \frac{\text{Area of Overlap}}{\text{Area of Union}}$$



**[https://github.com/qubvel/segmentation\\_models](https://github.com/qubvel/segmentation_models)**

