

CSC 535: Assignment #6

Due on Wednesday, October 31, 2018

Kobus Barnard

Ariyan, Manujinda, Marina

Question 1

Probability table

(a) Produce the 9×9 table $p(\text{measured_angle} \mid \text{angle})$

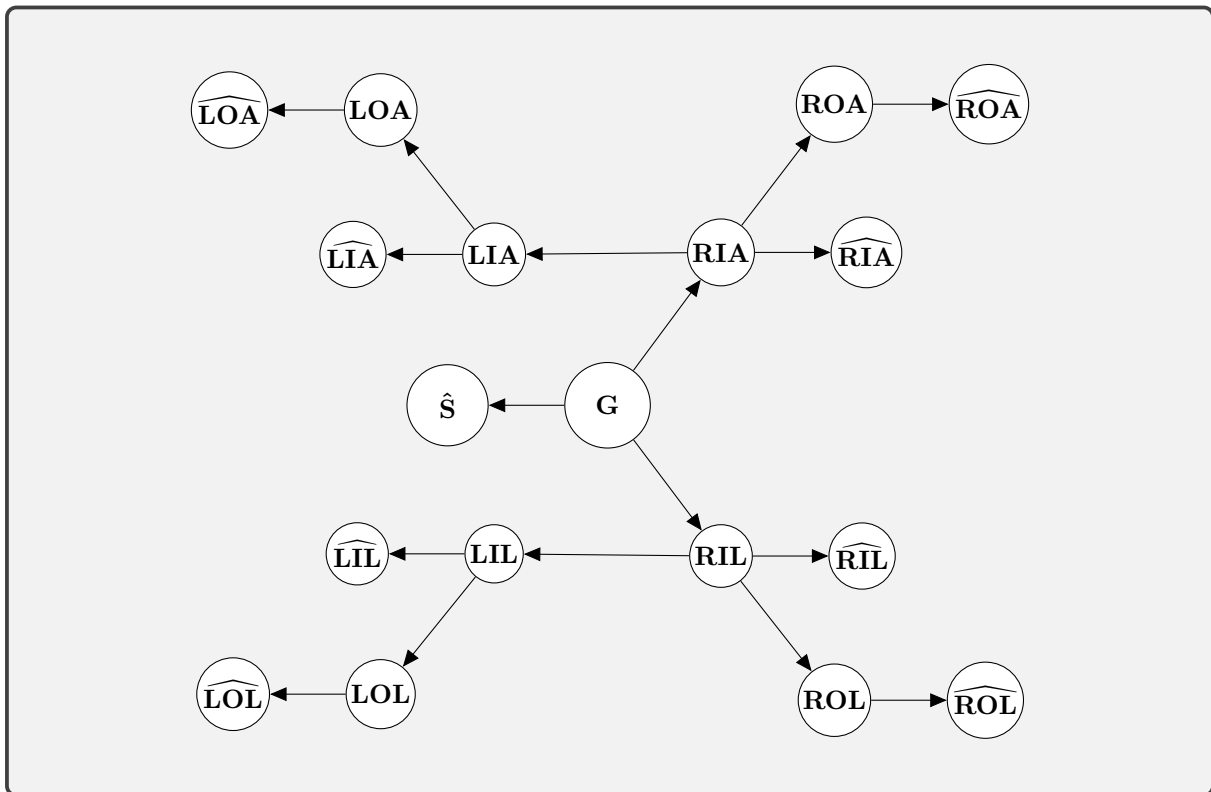
Table 1: $p(\text{measured_angle} \mid \text{angle})$

	Measured Angle								
	1	2	3	4	5	6	7	8	9
1	0.7	0.2	0.1	0	0	0	0	0	0
2	0.3	0.4	0.2	0.1	0	0	0	0	0
3	0.1	0.2	0.4	0.2	0.1	0	0	0	0
4	0	0.1	0.2	0.4	0.2	0.1	0	0	0
5	0	0	0.1	0.2	0.4	0.2	0.1	0	0
6	0	0	0	0.1	0.2	0.4	0.2	0.1	0
7	0	0	0	0	0.1	0.2	0.4	0.2	0.1
8	0	0	0	0	0	0.1	0.2	0.4	0.3
9	0	0	0	0	0	0	0.1	0.2	0.7

(b) Variance of the measurements

Question 2

Graphical Model



Question 3

Formula for the joint distribution

$$\begin{aligned}
& p(G, \hat{S}, RIA, RIL, ROA, ROL, \\
& \quad LIA, LIL, LOA, LOL, \\
& \quad \widehat{RIA}, \widehat{RIL}, \widehat{ROA}, \widehat{ROL}, \\
& \quad \widehat{LIA}, \widehat{LIL}, \widehat{LOA}, \widehat{LOL}) = p(G)p(\hat{S} \mid G)p(RIA \mid G)p(RIL \mid G) \\
& \quad p(LIA \mid RIA)p(ROA \mid RIA)p(LOA \mid LIA) \\
& \quad p(LIL \mid RIL)p(ROL \mid RIL)p(LOL \mid LIL) \\
& \quad p(\widehat{RIA} \mid RIA)p(\widehat{ROA} \mid ROA)p(\widehat{RIL} \mid RIL)p(\widehat{ROL} \mid ROL) \\
& \quad p(\widehat{LIA} \mid LIA)p(\widehat{LOA} \mid LOA)p(\widehat{LIL} \mid LIL)p(\widehat{LOL} \mid LOL)
\end{aligned}$$

Question 4

Generated samples

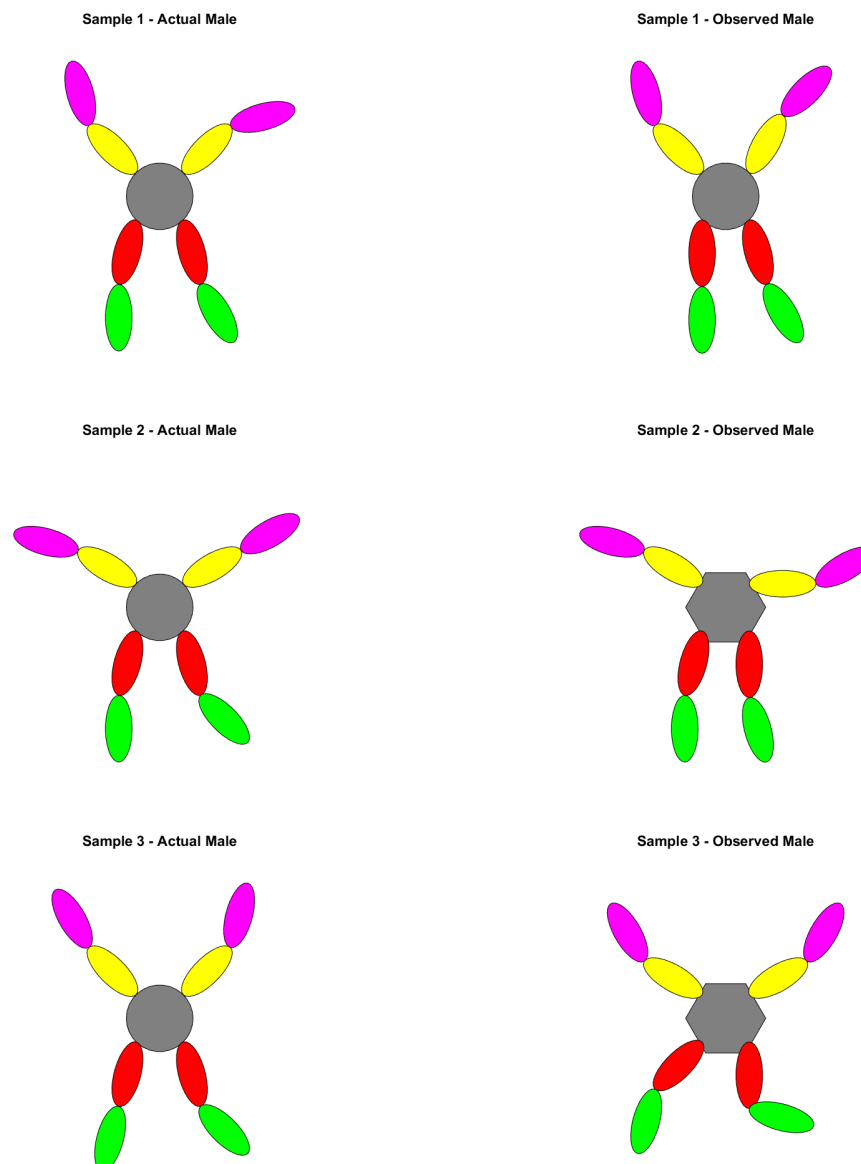


Figure 1: Generated samples 1 - 3 for idealized individuals and observed appearance.

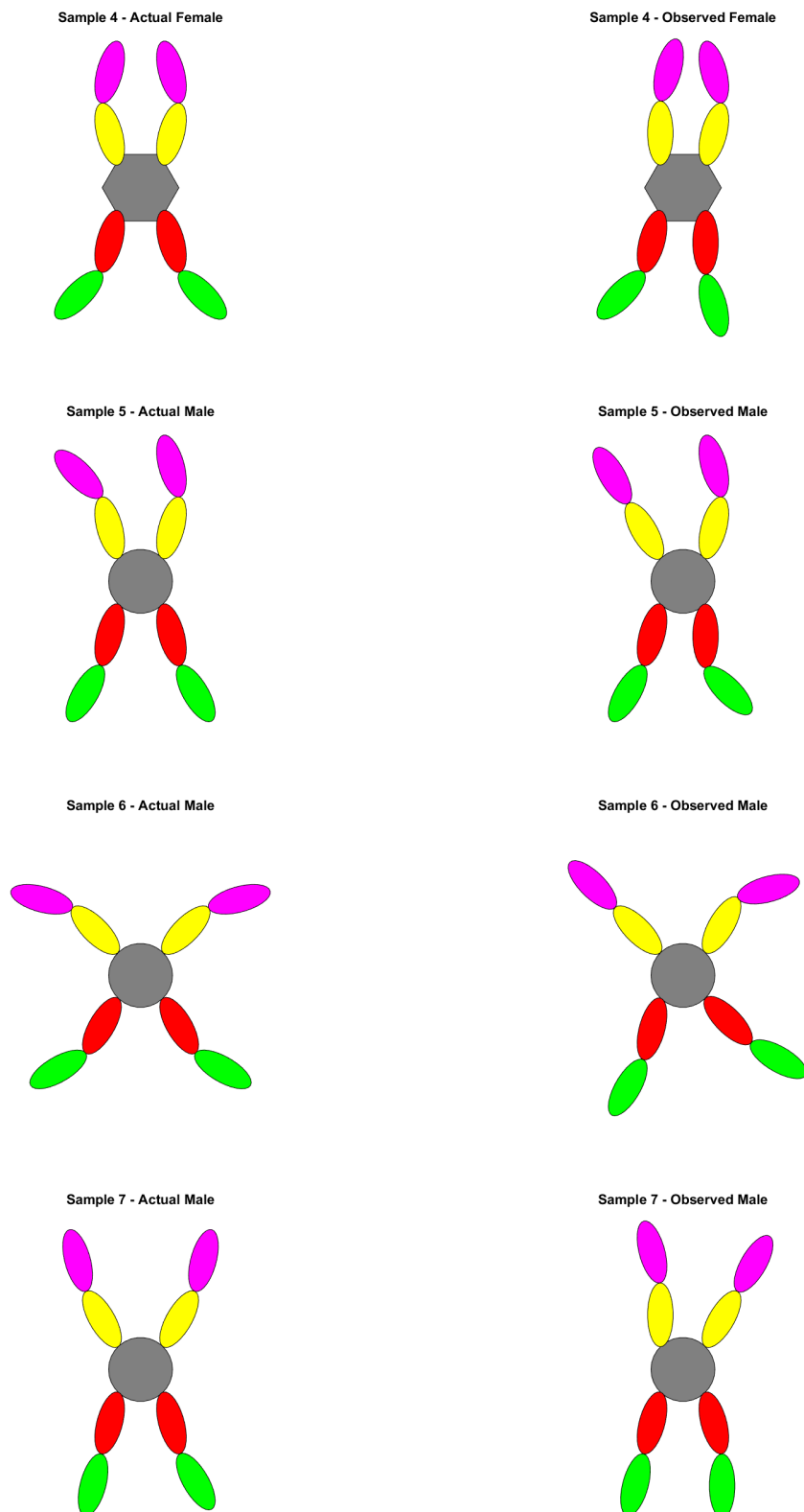


Figure 2: Generated samples 4 - 7 for idealized individuals and observed appearance.

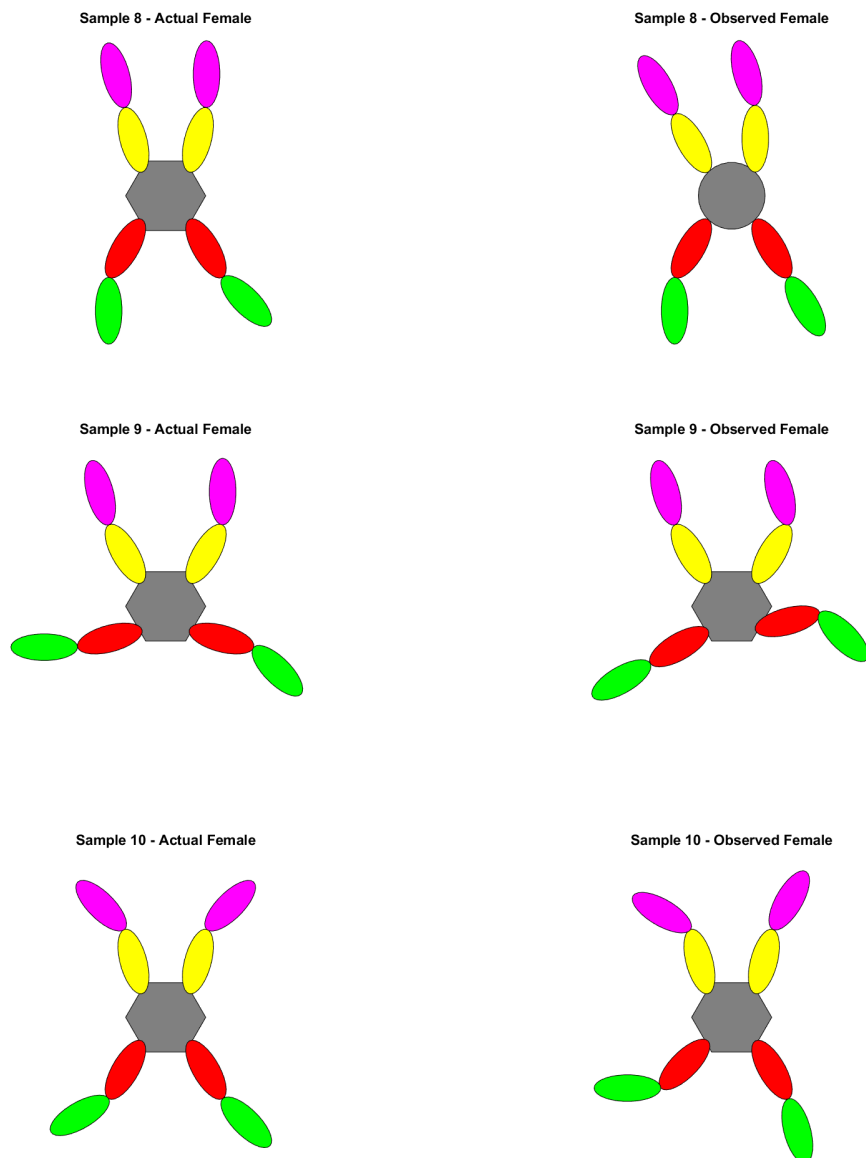


Figure 3: Generated samples 8 - 10 for idealized individuals and observed appearance.

Question 5

Deciding gender of MQLs from images

(a) From image of idealized individuals

(b) From image of observed appearance

Question 6

Generating synthetic data to experiment with inference

(a) xxx