Bayesian Inference

Continuous → Normal, Uniform
Beta, Gamma
Discrete → Binomial,
Poisson

Continuous Variables

Prior Elicitation

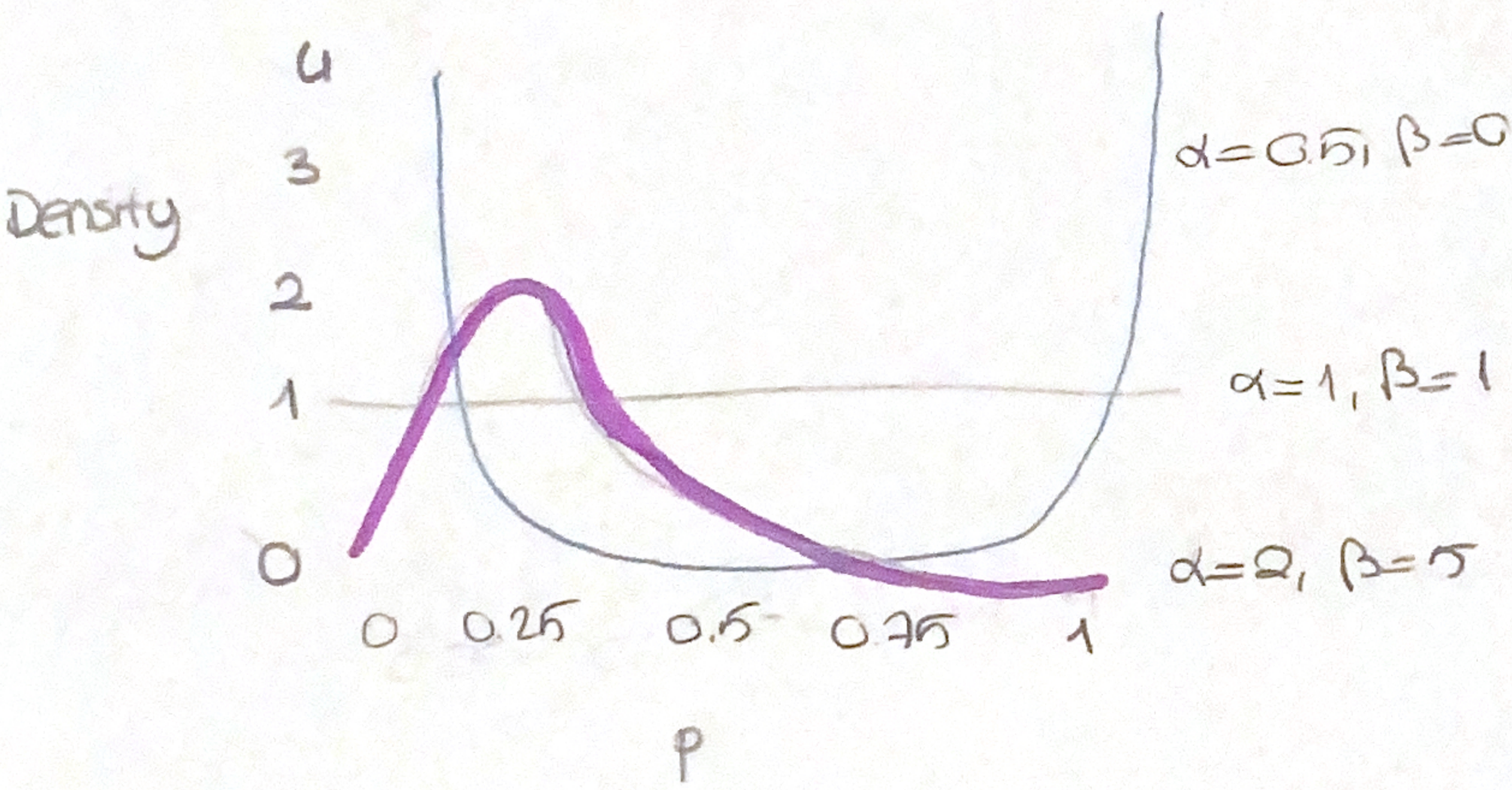
p comes from β distribution. (beta family)

$p \sim beta(\alpha, \beta)$

if $\alpha = \beta = 1 \rightarrow$ beta distribution is uniform.

$E(p) = \frac{\alpha}{\alpha+\beta}$ $\alpha \rightarrow$ prior number of success.
$\beta \rightarrow$ prior number of failures

If $\alpha = \beta \rightarrow$ symmetrical



Conjugacy

Prior Beliefs → Bin(n, p) n known p unknown
beta(α, β)

Observed → x success in n trials

density: $p|x \sim beta(\alpha+x, \beta+n-x)$

Conjugacy occurs when posterior distribution is in the same family of prob density functions with prior belief.