

$$f_S, f_B, \underbrace{\bar{N}_S, \bar{N}_B}$$

↪ expected number in full dataset

$$N'_S = \overset{\text{TPR}}{E_S} \bar{N}_S$$

$$\textcircled{N'_B} = \underset{\text{FPR}}{E_B} \bar{N}_B$$

$$\hat{N}_S = \hat{N} - \bar{N}_B$$

$$\hat{N}'_S = \hat{N}' - \bar{N}'_B$$

↪ get by applying the selector

$$\hat{\sigma}_S = \sqrt{\hat{N}}$$

⇒

$$\hat{\sigma}'_{S'} = \sqrt{\hat{N}'}$$

$$\frac{\hat{N}'_S}{\hat{\sigma}'_{S'}}$$

$$= \hat{\sigma}'_{S'} = \sqrt{\bar{N}_B + \bar{N}_S}$$

Measure of how good my
claim of discovery is:

$$\Rightarrow \text{sig} = \frac{\bar{N}'_S}{\sqrt{\bar{N}'_S + \bar{N}'_B}}$$