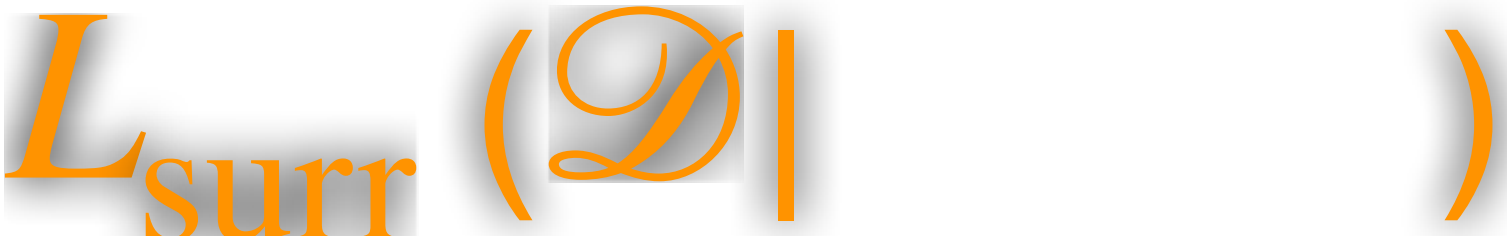
A surrogate model for the Likelihood

f(x)
x

$$L_{\text{surr}}(\Lambda \mid \mathscr{D}) \sim$$

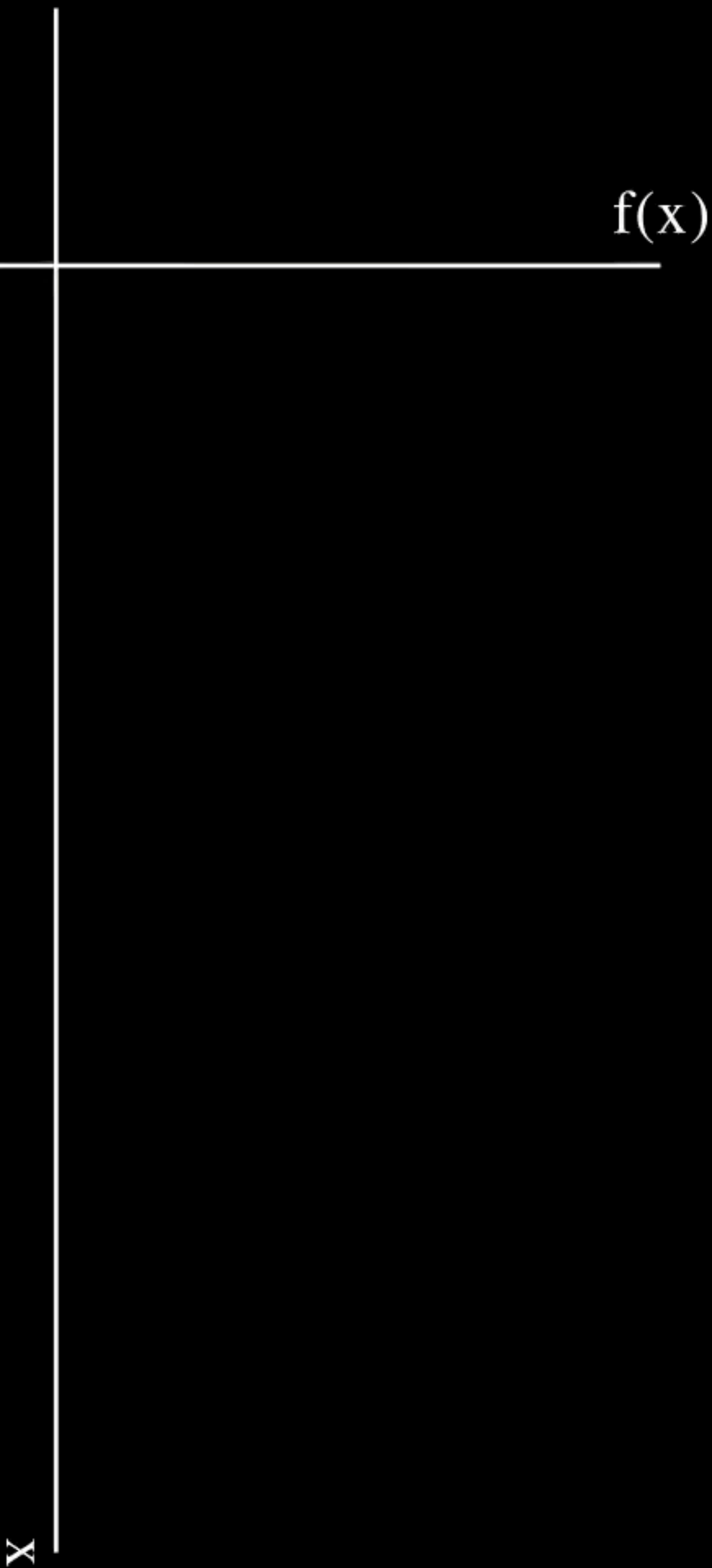
$$\mathcal{N}(\mu_{\mathrm{GP}}(\Lambda),\ \sigma^2_{\mathrm{GP}}(\Lambda))$$

TensorFlow




COMPAS
parameters

16/20


f(x)
x

Forward (simulator) modelling

A surrogate model for the Likelihood

$L_{\text{surr}}(\mathscr{D} \mid \text{COMPAS parameters})$

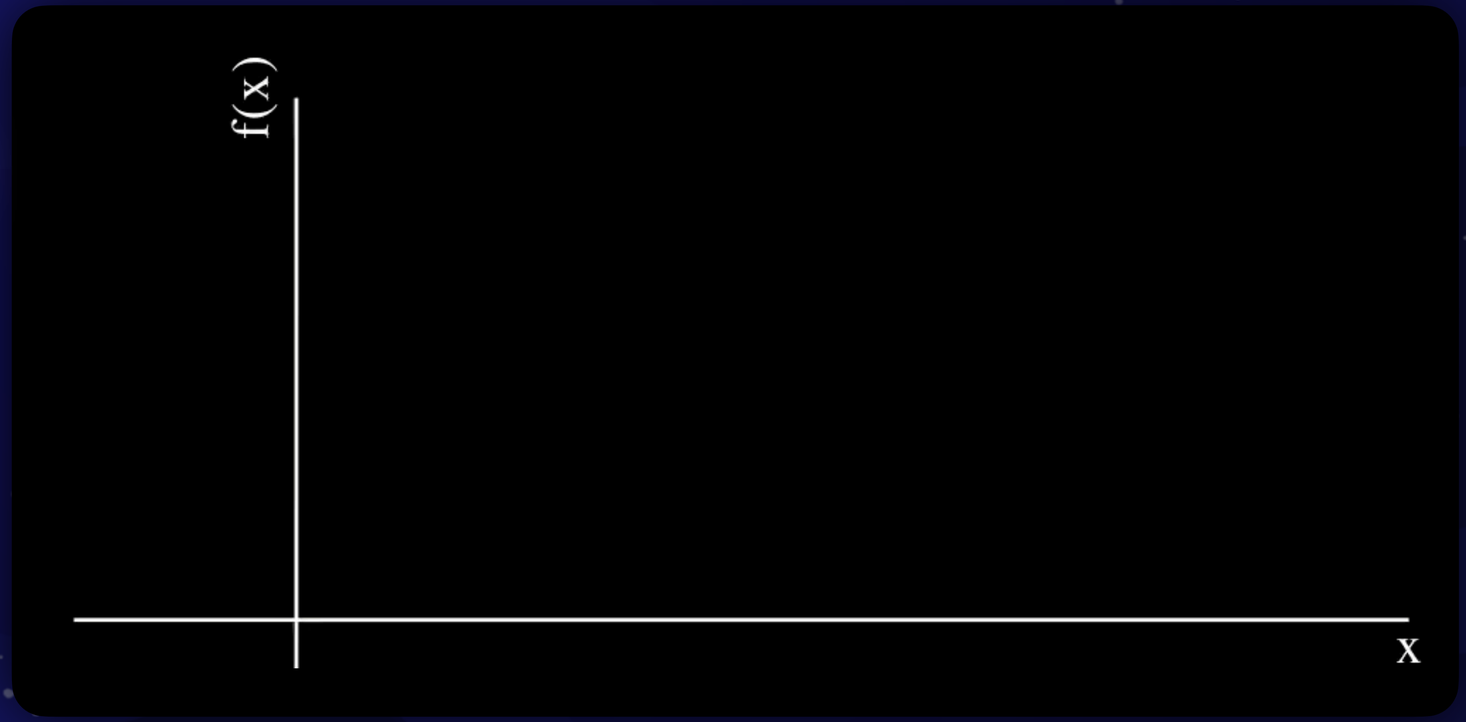
TensorFlow

$$L_{\text{surr}}(\Lambda \mid \mathscr{D}) \sim \mathcal{N}(\mu_{\text{GP}}(\Lambda),\ \sigma^2_{\text{GP}}(\Lambda))$$

An active learning process
Observe training data as needed

Exploration
dictated by σ_{GP}

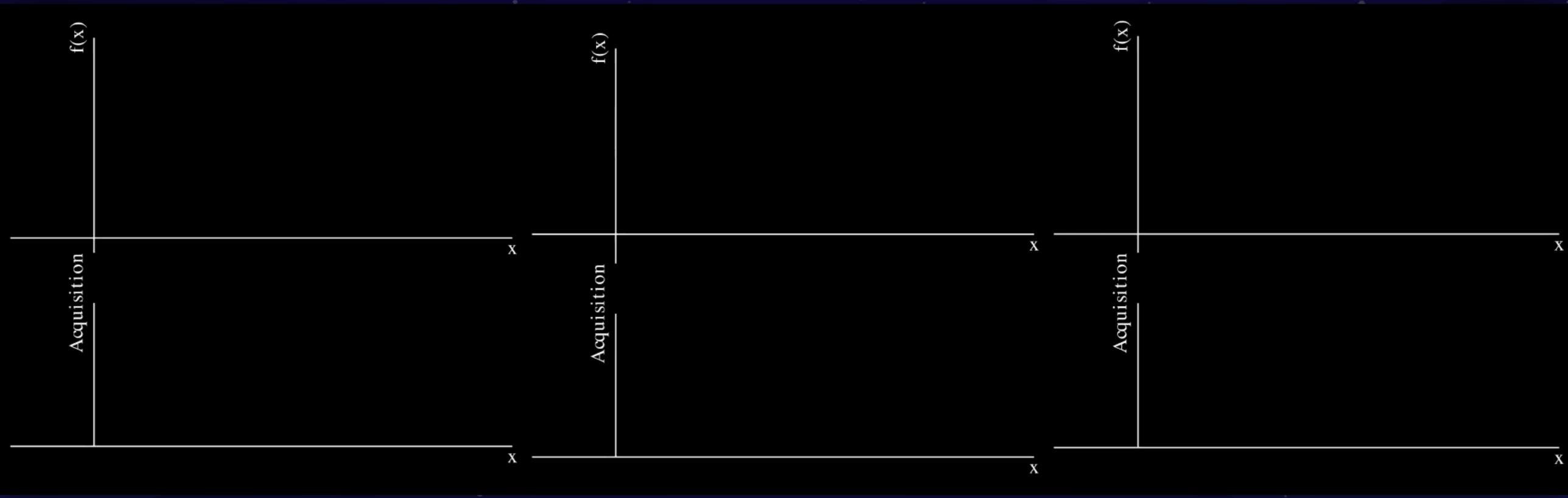
Exploitation (Local optimisation)
dictated by μ_{GP}



Bayesian optimisation

Active learning for the surrogate Likelihood

Exploitation *Exploration* *Mixture*



Acquisition function $\rightarrow$ next Λ for COMPAS simulation that improves $L_{\text{surr}}(\mathscr{D} \mid \Lambda)$