

# Inference frameworks

## Wright-Fisher process at the core

Summary statistics  
and simple calculations  
(small data, simple population)

$\Pi$  : average pairwise divergence

$S$  : # segregating sites

$T_D$  : deviation from neutrality

Probabilistic models  
(big data, more complex populations)

Forward time:

- PDEs / diffusion

- selective sweeps



Reverse time:

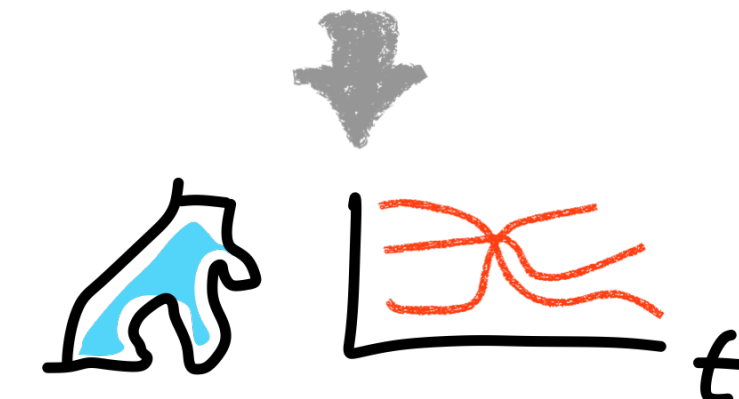
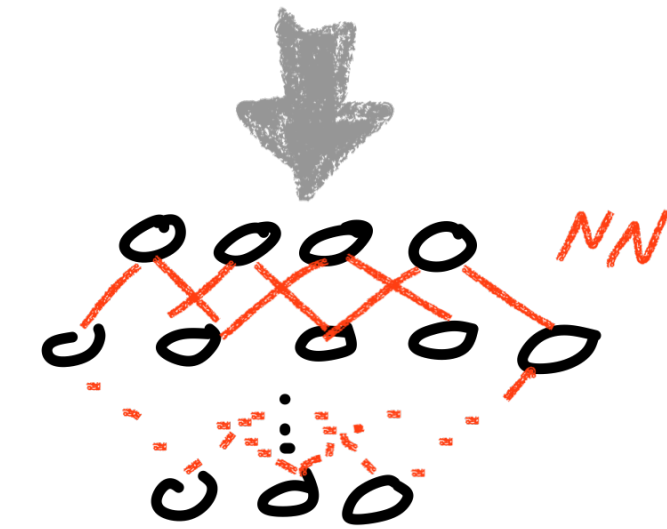
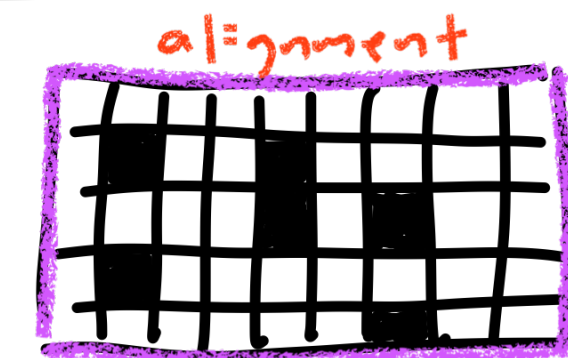
- coalescent genealogy

- coalescent HMM



Machine learning  
(big data, arbitrarily complex population)

Supervised learning



# Problem

The Wright-Fisher process is wrong!

Question: what's missing w/ WF model?