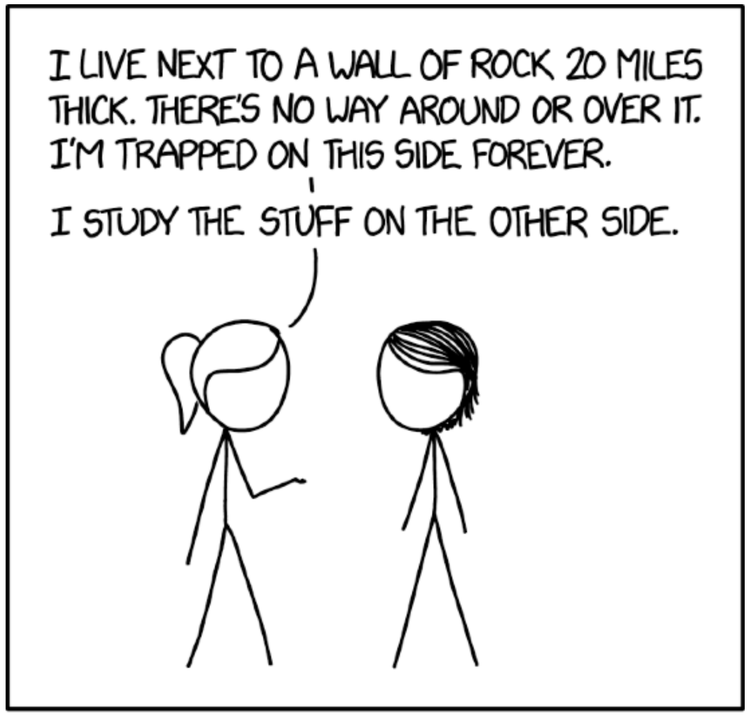
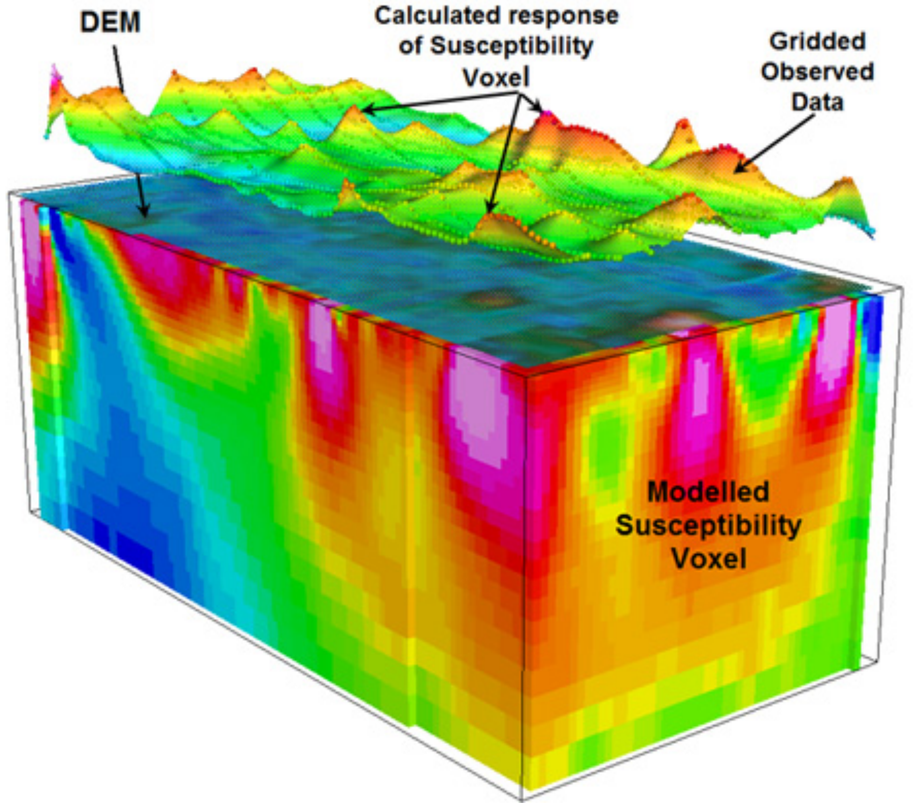
Inverse problems





$$g(x) = \int K(x, y) f(y) \mathrm{d}y$$

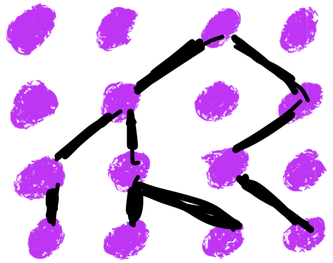
data

model

stuff we want to know about

Inference frameworks

Wright-Fisher process at the core



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

π : average pairwise divergence

S : # segregating sites

T_D : deviation from neutrality

Probabalistic models (big data, more complex populations)

Forward time:

- PDEs / diffusion
- selective sweeps

Reverse time:

- coalescent geneology
- coalescent HMM

Machine learning (big data, arbitrarily complex population)

Supervised learning