

MaxVar

The maximum variance acquisition method

- The next evaluation point is acquired where the variance of the unnormalised approximate posterior is maximised

$$\theta_{t+1} = \arg \max_{\theta} \text{Var}(p(\theta) \cdot p_a(\theta))$$

$$p_a(\theta) = \Phi \left(\frac{\epsilon - \mu_{1:t}(\theta)}{\sqrt{v_{1:t}(\theta) + \sigma_n^2}} \right)$$

- ϵ is the ABC threshold, $\mu_{1:t}$ and $v_{1:t}$ are determined by the GP surrogate, σ_n^2 is the noise.

RandMaxVar

The randomized maximum variance acquisition method

- The next evaluation point is drawn randomly from the density corresponding to the variance of the posterior

$$\theta_{t+1} \sim q(\theta), \text{ where } q(\theta) \propto \text{Var}(p(\theta) \cdot p_a(\theta))$$

$$p_a(\theta) = \Phi \left(\frac{\epsilon - \mu_{1:t}(\theta)}{\sqrt{v_{1:t}(\theta) + \sigma_n^2}} \right)$$

- ϵ is the ABC threshold, $\mu_{1:t}$ and $v_{1:t}$ are determined by the GP surrogate, σ_n^2 is the noise.