Maximum probability of improvement (MPI)

Current best value : f^*

$$\mu(x) = P(\widehat{f}(x) \geq f^* + \epsilon) = \Phi(\frac{\mathbb{E}\widehat{f}(x) - f^* - \epsilon}{\mathrm{Var}[\widehat{f}(x)]})$$

Works well if value of maximum is known