

In general:

$$P((f_{\text{emu}} \ \mathbf{x}) \mid \text{memo table} = (\mathbf{x}_{\text{past}}, \mathbf{y}_{\text{past}})) \sim P(f(\mathbf{x}) \mid f(\mathbf{x}_{\text{past}}) = \mathbf{y}_{\text{past}}),$$

where $f \sim P(f_{\text{emu}} \mid \text{memo table} = (\emptyset, \emptyset))$

For $\mathcal{GP}(\mu_{\text{prior}}, K_{\text{prior}})$ prior on f_{emu} :

$$P((f_{\text{emu}} \ \mathbf{x}) \mid \mathbf{x}_{\text{past}}, \mathbf{y}_{\text{past}}) \sim \mathcal{N}(\mu(\mathbf{x}), K(\mathbf{x}, \mathbf{x}))$$

$$\mu(\mathbf{x}) = \mu_{\text{prior}}(\mathbf{x}) + K_{\text{prior}}(\mathbf{x}, \mathbf{x}_{\text{past}}) K_{\text{prior}}(\mathbf{x}_{\text{past}}, \mathbf{x}_{\text{past}})^{-1} (\mathbf{y}_{\text{past}} - \mu_{\text{prior}}(\mathbf{x}_{\text{past}}))$$

$$K(\mathbf{x}, \mathbf{x}) = K_{\text{prior}}(\mathbf{x}, \mathbf{x}) - K_{\text{prior}}(\mathbf{x}, \mathbf{x}_{\text{past}}) K_{\text{prior}}(\mathbf{x}_{\text{past}}, \mathbf{x}_{\text{past}})^{-1} K_{\text{prior}}(\mathbf{x}_{\text{past}}, \mathbf{x})$$

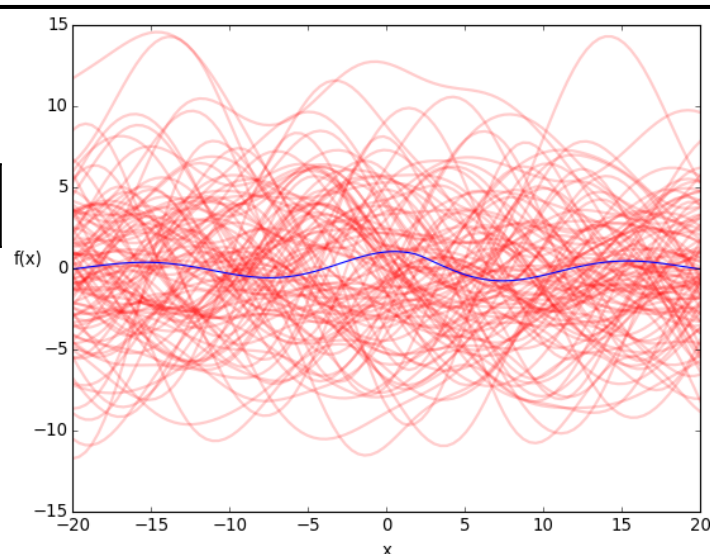
If f is (nearly) smooth, then as $|\mathbf{x}_{\text{past}}| \rightarrow \infty$, $f_{\text{emu}} \approx f$.

```
(assume_list
 (f_probe f_emu)
 (mem&em f θ))
```

[code that calls f_{emu} but not f_{probe}]

$f_{\text{emu}} \sim$

\mathbf{x}	$(f \ \mathbf{x})$

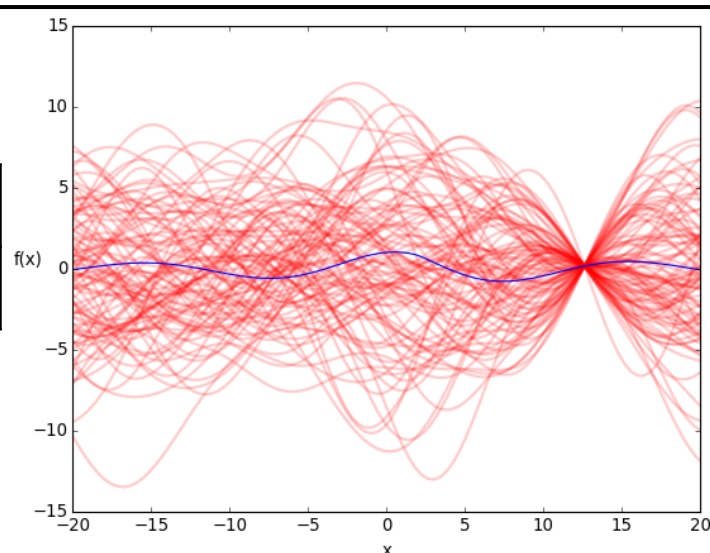


```
(predict (f_probe x_1))
```

[code that calls f_{emu} but not f_{probe}]

$f_{\text{emu}} \sim$

\mathbf{x}	$(f \ \mathbf{x})$
x_1	y_1



```
(predict (f_probe x_2))
```

[code that calls f_{emu} but not f_{probe}]

$f_{\text{emu}} \sim$

\mathbf{x}	$(f \ \mathbf{x})$
x_1	y_1
x_2	y_2

