Current partial progress on example for FoKL-GPy's "to_pyomo" method, 2024/03/18

Known (i.e., toy problem):

$$t \in [0, 1]$$

$$\begin{cases} x_0 = \sin(3\,\pi\,t) \\ x_1 = \cos(3\,\pi\,t) \end{cases}$$

$$y = -\sin(\pi\,t)\,(\mathcal{B}_1(x_0) + \mathcal{B}_2(x_1) + \mathcal{B}_2(x_0)\,\mathcal{B}_3(x_1))$$
where $\mathcal{B} \equiv$ scaled orthogonal Bernoulli polynomial

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Goal:

$$\text{Find } t \text{ for } y = y_{\max}.$$

Solution:

- A FoKL model was trained to find $y = f(x_0, x_1)$.
- The FoKL model was converted to Pyomo.
- Pyomo constraints were added for $x_0 = f(t)$ and $x_1 = f(t)$.

Current Results:

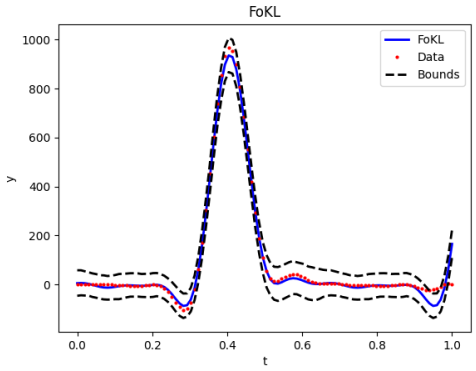

Figure 1. FoKL model

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EXIT: Optimal Solution Found.

y_avg = 2.9555881048833896
x0 = 0.5859198742533958
x1 = 0.9925624581799593
t = 0.01832370958676231
```

Figure 2. Pyomo solution