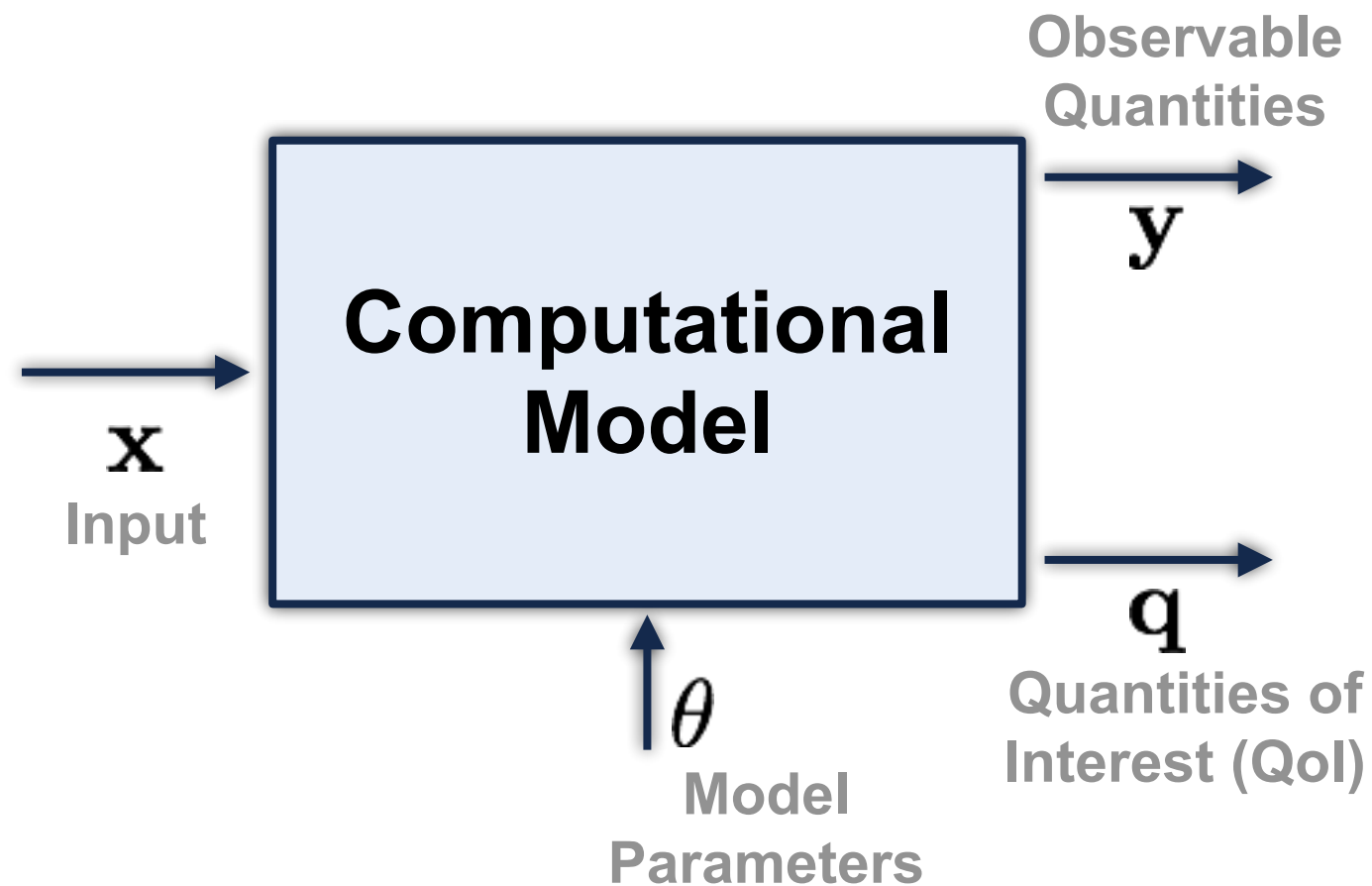


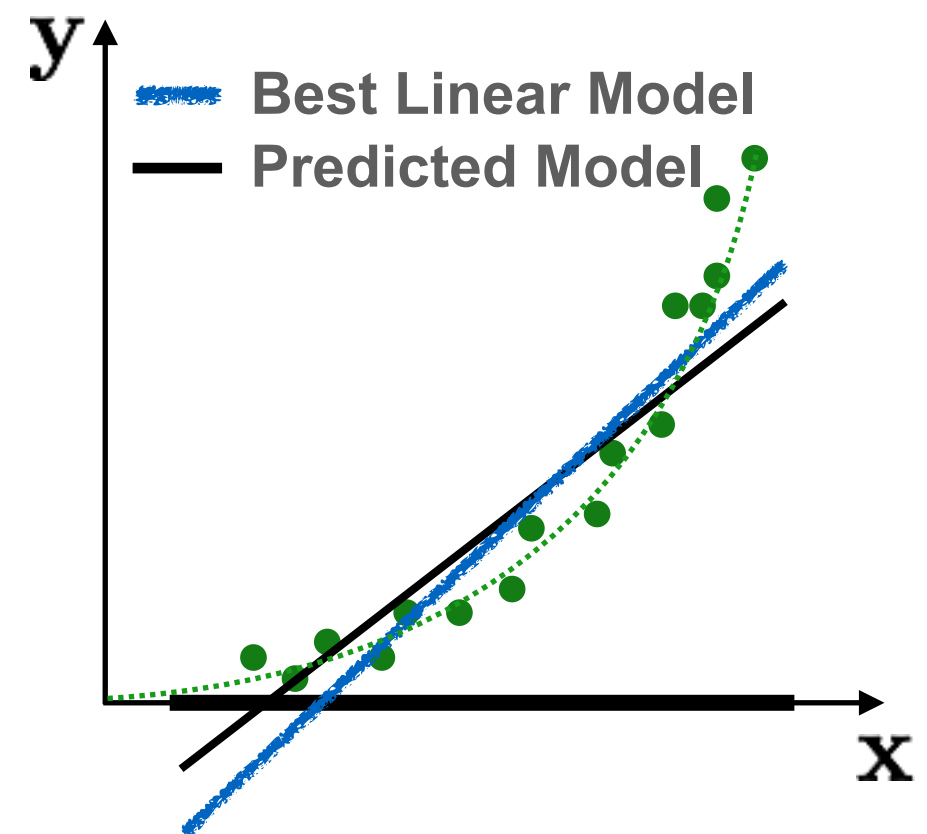
# Last Class ...

“The ultimate purpose of most computational models is to make predictions, commonly in support of some decision-making process (e.g, for design of operation of some system).” [1]



- Experimental or Measurement or **Observation Error**: ● vs —
- **Model Uncertainty** or Structural Inadequacy: — vs ●
- **Parameter Uncertainty**: — vs —

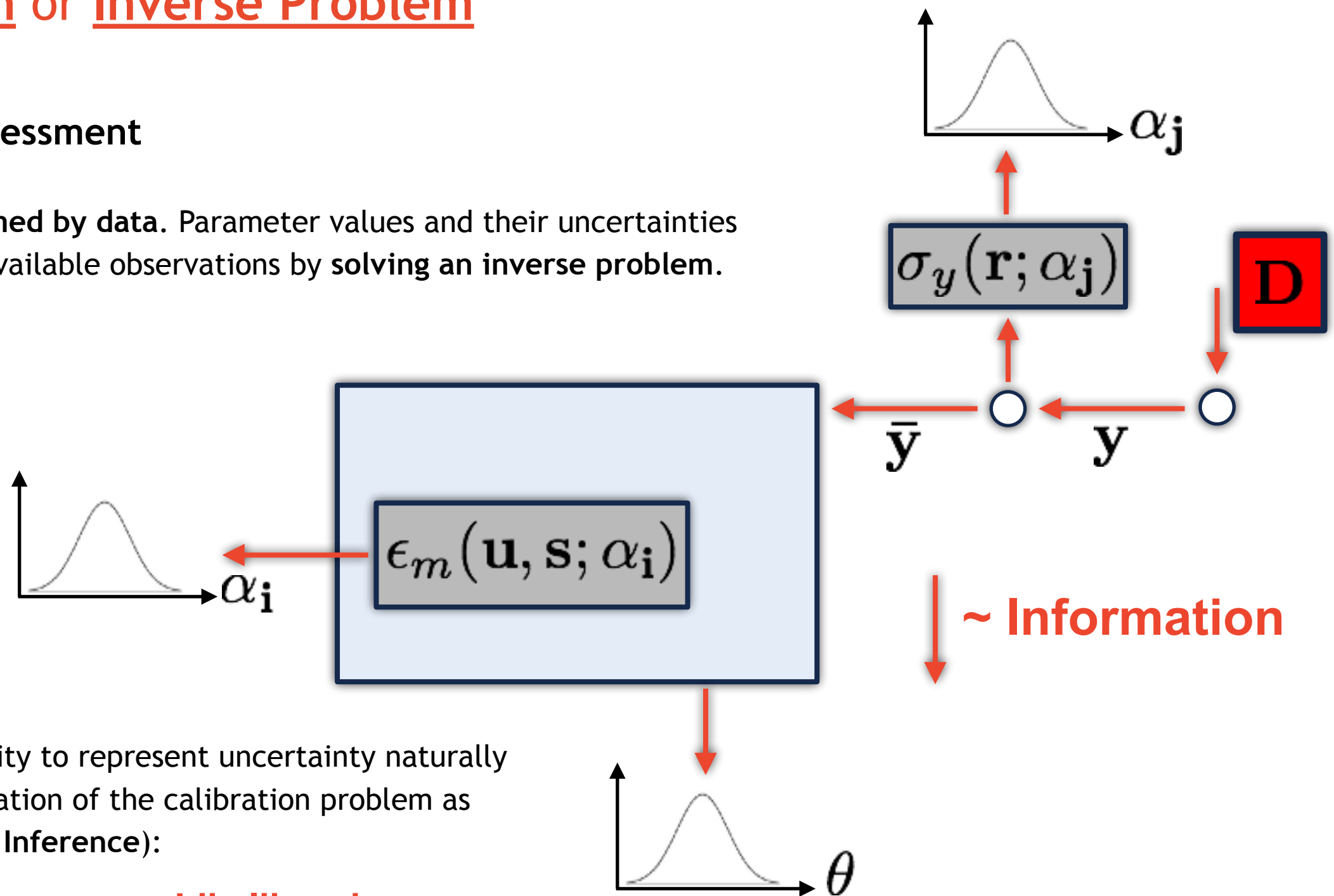
Due to Embedded Model!



# Last Class ...

- Calibration or Inverse Problem
- Validation
- Predictive Assessment

The model is **informed by data**. Parameter values and their uncertainties are inferred from available observations by **solving an inverse problem**.



The use of probability to represent uncertainty naturally leads to the formulation of the calibration problem as Bayesian (**Bayesian Inference**):

$$p(\theta, \alpha | \mathbf{D}, \mathcal{M}) = \frac{\text{Likelihood} \quad \text{Prior}}{\int \text{Likelihood} \quad \text{Prior} \, d\theta d\alpha}$$