Motivations

- Showing some UQ applications
  - Giving a road map of Predictive Science through examples;

- 2nd week of class … too early for applications?
  - Overview of the UQ class' building blocks;
  - Stimulating ideas for the final project.

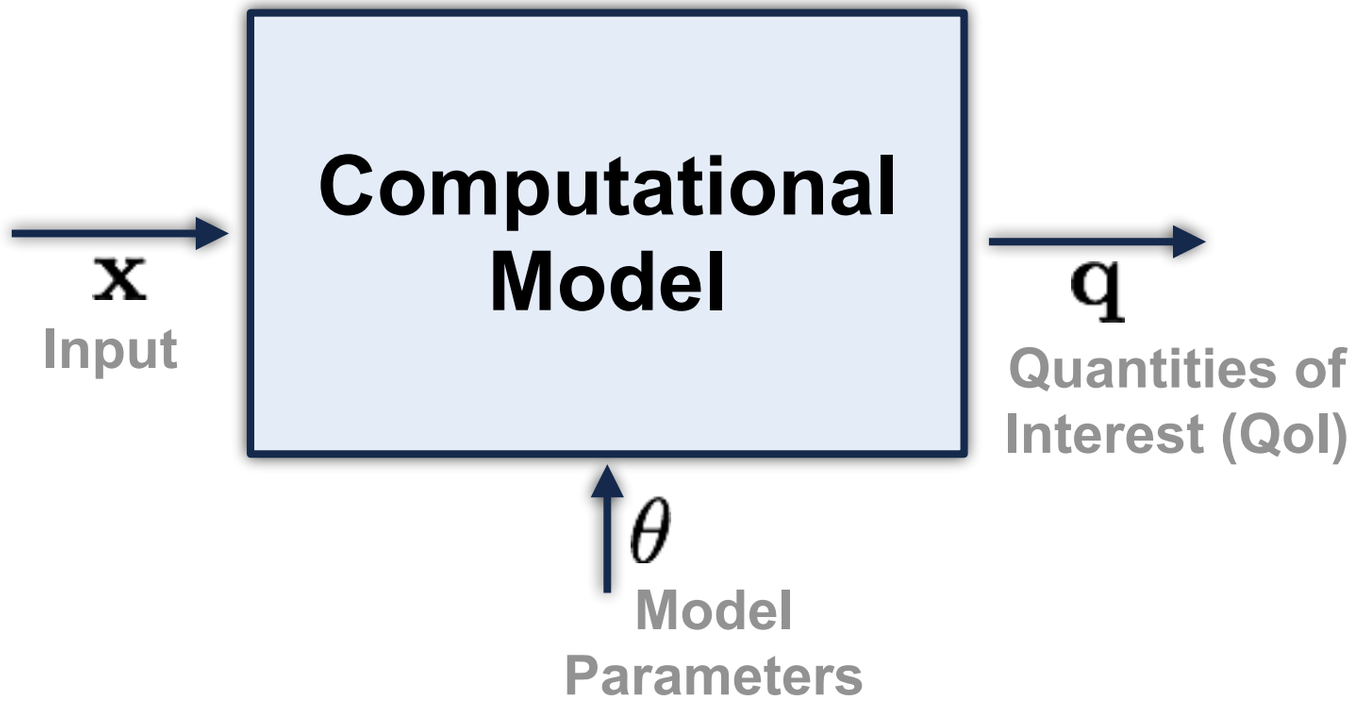
Outline

- Introduction
  - What is Predictive Science and why is it important for my research?

- A 1st Example: Mass-Spring-Damper System

Introduction

"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]



Reliability Assessment of the Computational Model

- **Verification**: Computer Simulation vs Mathematical Model
- **Uncertainty Quantification**: Determining uncertainties on the QoIs
- **Validation**: Deciding whether the model is a sufficient representation of reality for the purpose for which it will be used

[1] Oliver et al., "*Validating Predictions of Unobserved Quantities*", Computer Methods in Applied Mechanics and Engineering, Vol. 283, 2015.