

Lecture 1: Introduction to Predictive Modeling

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What is predictive modeling?

What can go wrong in an engineering system?

- Engineering systems can be very complicated.
- There are **known knowns**.
- There are **known unknowns**.
- There are **unknown unknowns**.



Orbiter challenger as it lifts from Pad 39A

A shot at defining predictive modeling

Predictive modeling is the process of describing our state of knowledge about *known unknowns* in order to make informed decisions.

What about unknown unknowns?

- There is no widely accepted automated way for turning unknown unknowns into known unknowns.
- Effectively, this is what science is doing.
- Automating the process requires understanding how humans perform induction.
- It may require general artificial intelligence.