

SIMIODE Text

Kurt Bryan

February 11, 2022

Motivation

Motivation

- Use modeling and applications of ODE's right up front, to motivate why the subject is important...

Motivation

- Use modeling and applications of ODE's right up front, to motivate why the subject is important...
- To illuminate, not to replace the mathematics. Application and modeling provide context and a hook for ODE's, and help students see the effectiveness of ODE's as a tool for describing the world.

Motivation

- Use modeling and applications of ODE's right up front, to motivate why the subject is important...
- To illuminate, not to replace the mathematics. Application and modeling provide context and a hook for ODE's, and help students see the effectiveness of ODE's as a tool for describing the world.
- Incorporate important allied topics and applications to enrich the presentation, for example, dimensional analysis and scaling, parameter estimation, control theory, and model assessment using data.

Highlights

- The text incorporates many SIMIODE modeling projects, and some new ones.

Highlights

- The text incorporates many SIMIO modeling projects, and some new ones.
- Many projects include data sets.

Highlights

- The text incorporates many SIMIODE modeling projects, and some new ones.
- Many projects include data sets.
- The text includes inline “Reading Exercises,” traditional end-of-section problems, and numerous end-of-chapter modeling projects. There is a complete set of solutions available.

Highlights

- The text incorporates many SIMIODE modeling projects, and some new ones.
- Many projects include data sets.
- The text includes inline “Reading Exercises,” traditional end-of-section problems, and numerous end-of-chapter modeling projects. There is a complete set of solutions available.
- There is an allied website that contains data sets and code in Maple, Mathematica, Matlab, and Sage.

Suggestions?

- Are there additional mathematical topics that should be covered, either in the main text or an appendix?
- Are there additional areas of application that should receive attention (e.g. in problems or projects, or even a section of the book?)
- Are there other resources that would help—for example, computational support in another programming language?
- Anything else?