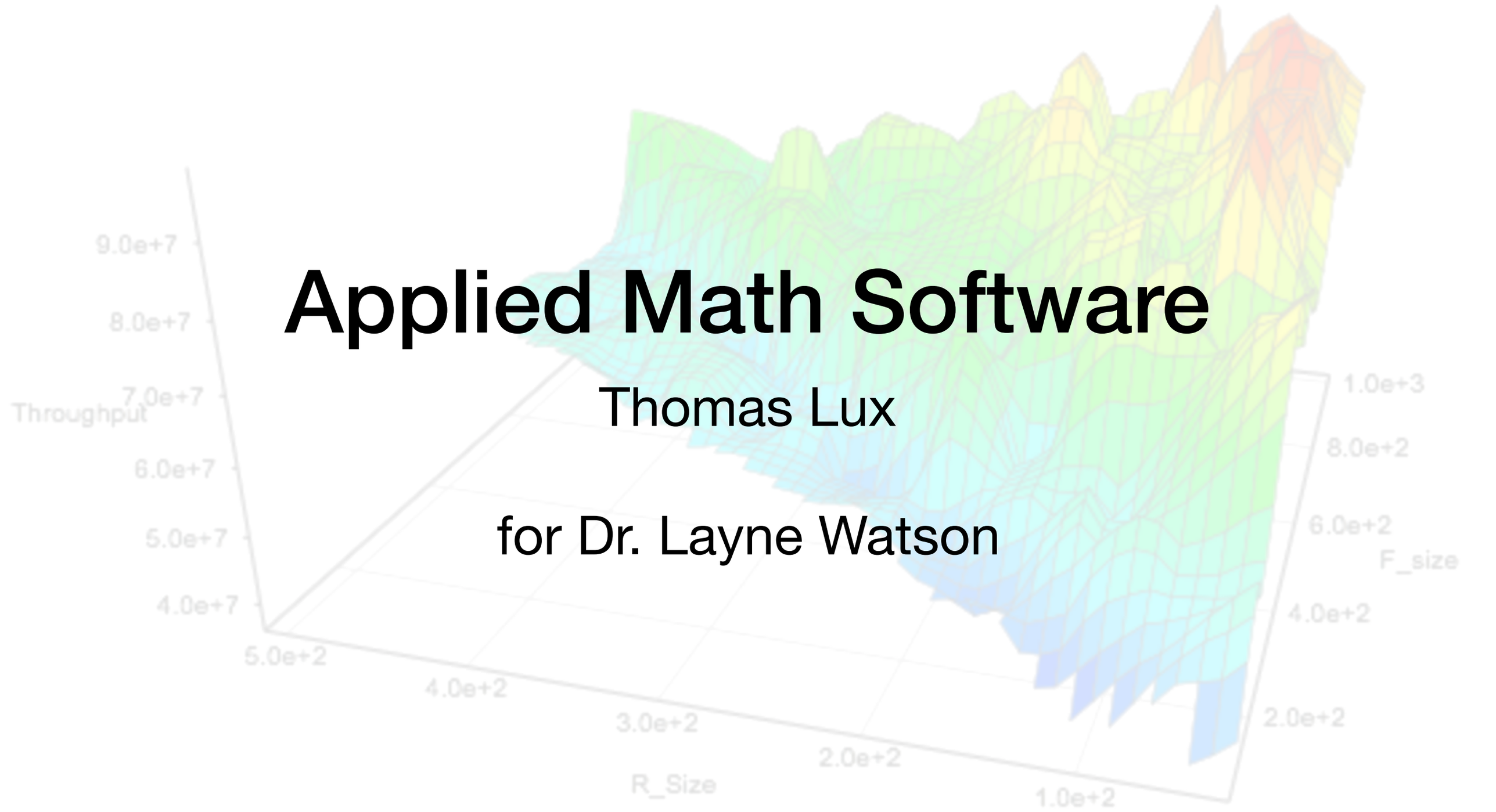

Applied Math Software

Thomas Lux

for Dr. Layne Watson

COLLEGE OF ENGINEERING
COMPUTER SCIENCE
VIRGINIA TECH

Modeling and Analysis for HPC Systems

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Modeling and Analysis for HPC Systems

Computers have many interacting parts, when we run the same program repeatedly performance will vary.

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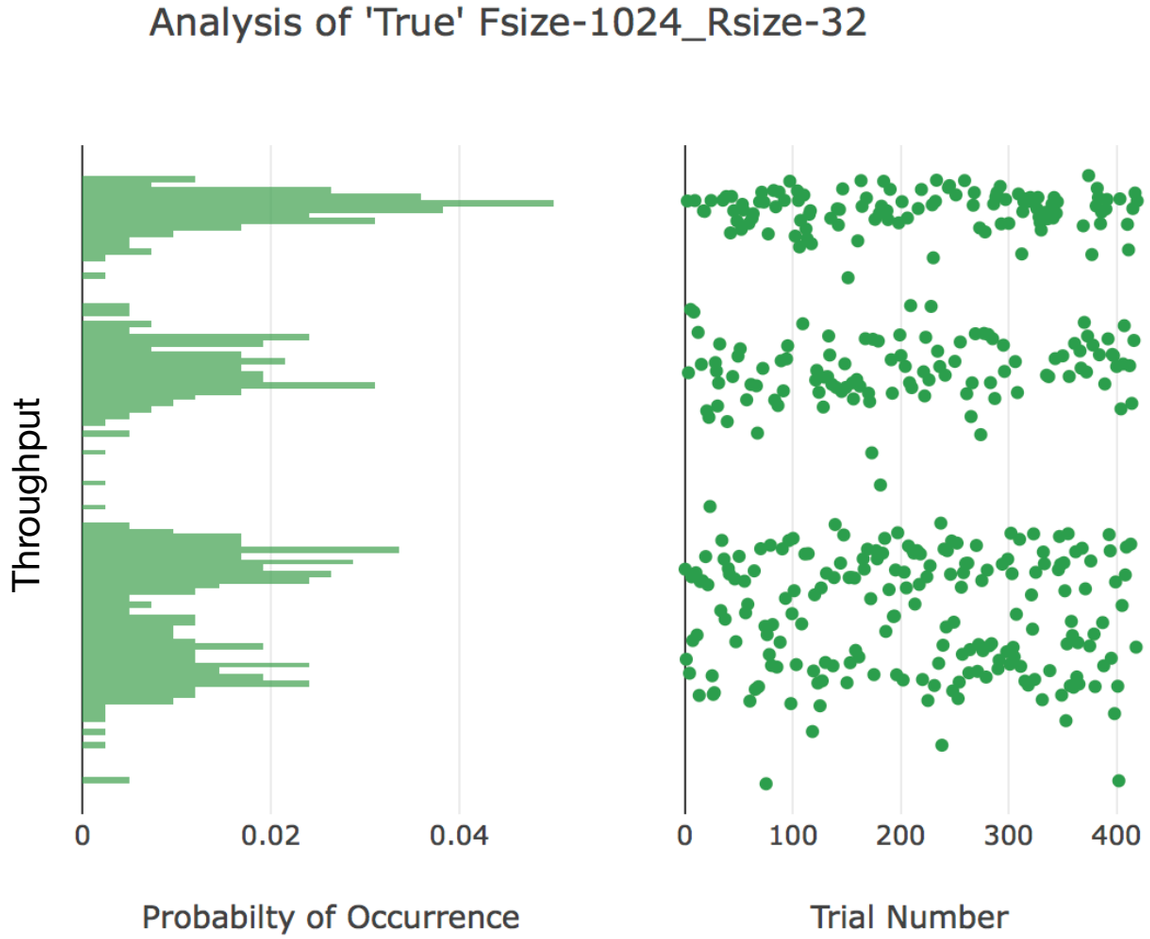

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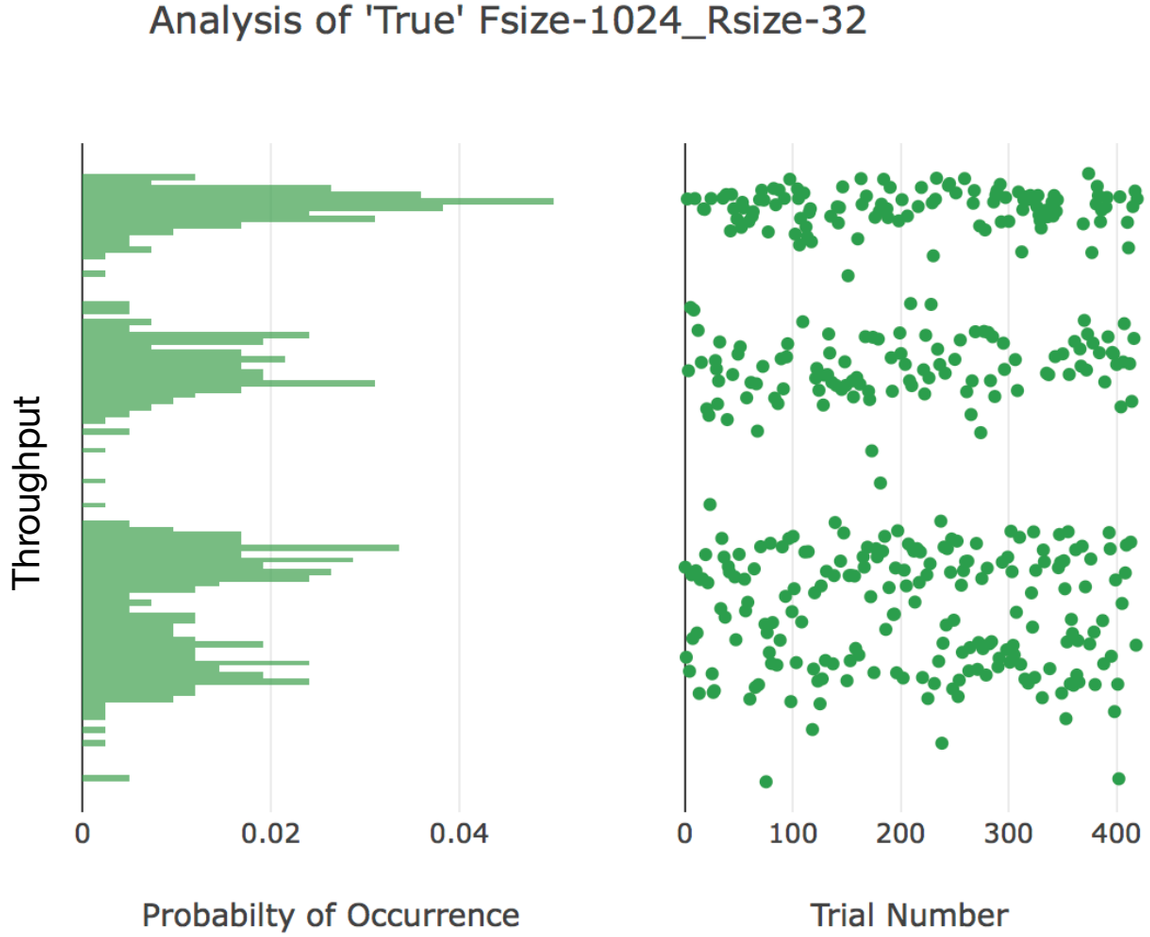

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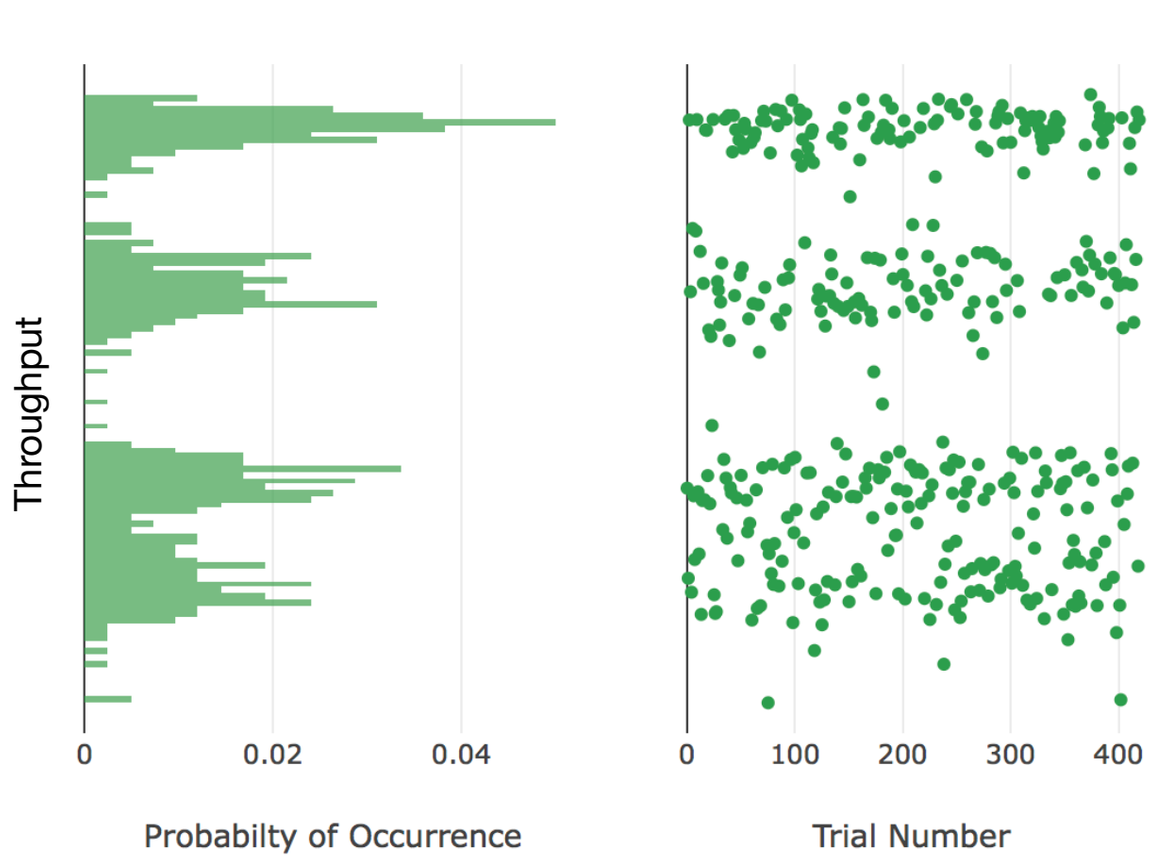

Can we predict how a computer will perform a task based on its configuration?

Can we model and predict this stochastic behavior?

We CAN Model Systems, but…

It’s a hard problem that requires new methods.

Typical machine learning would use a common algorithm like neural networks, decision trees, etc..

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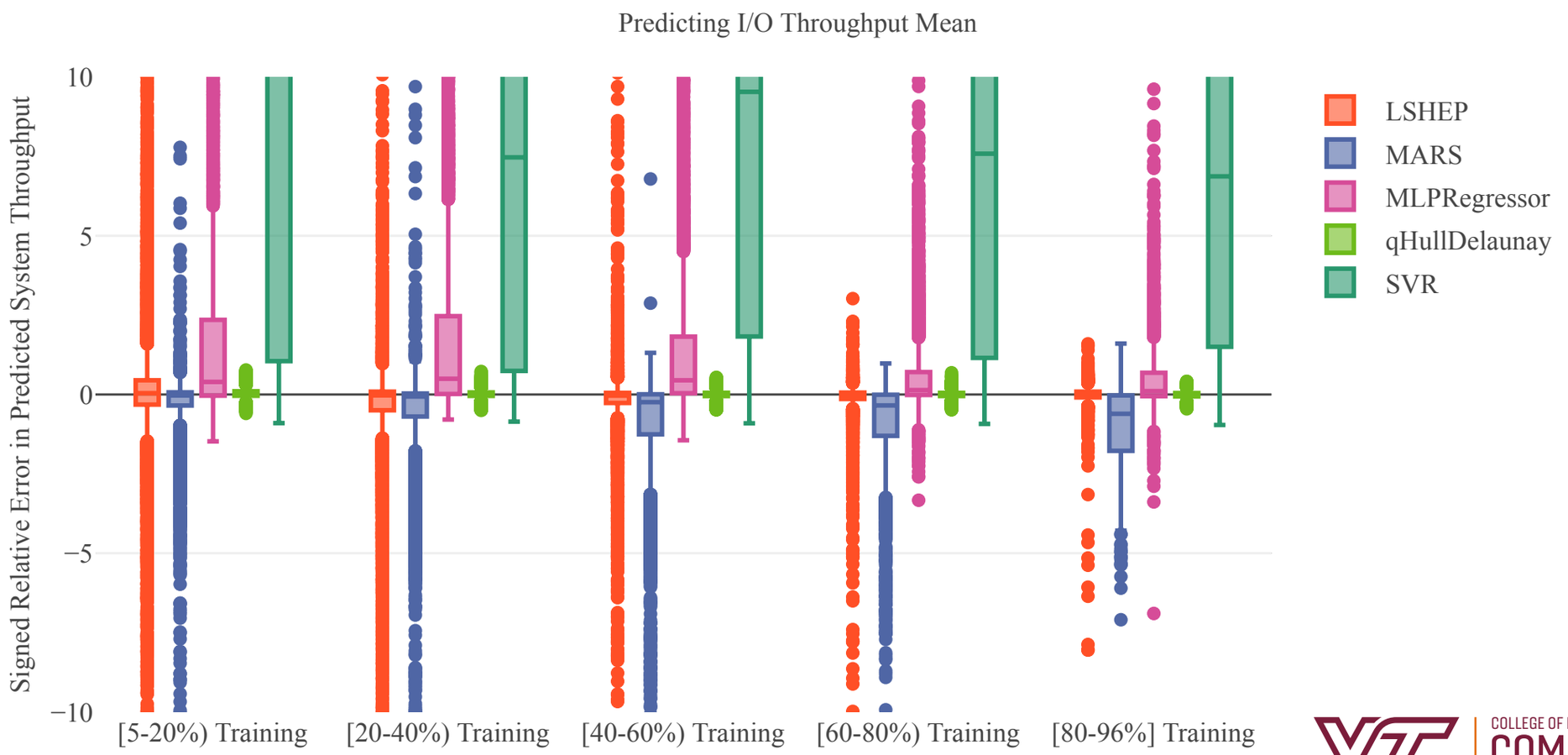

Intro → Math Modeling

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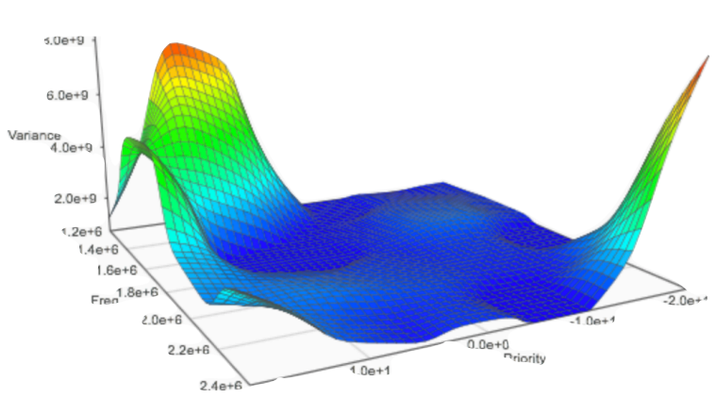
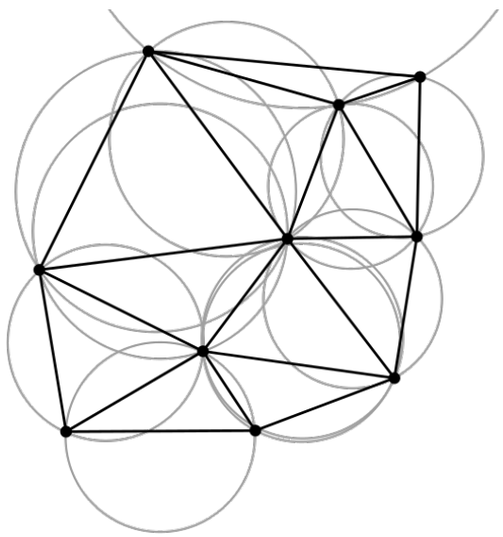
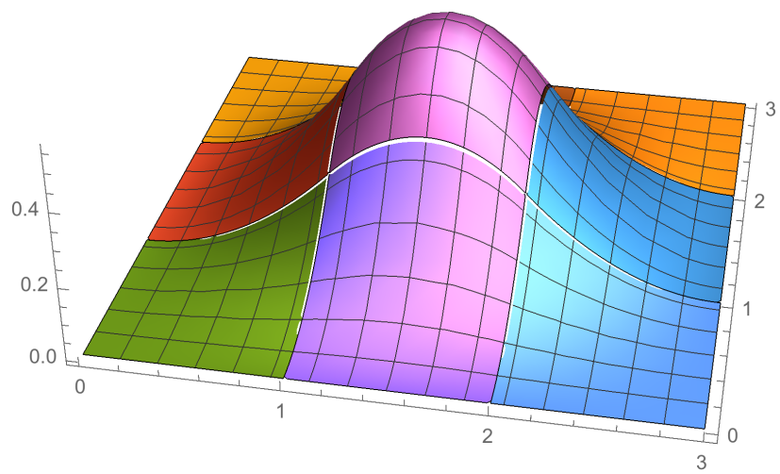






Linear Shepard, *Delaunay Triangulation*, and *Box Splines* are three examples of deterministic interpolants.

Other Projects…

Genetic Algorithms for composite structure (aircraft) design

Fluid mechanics simulation with large ODEs

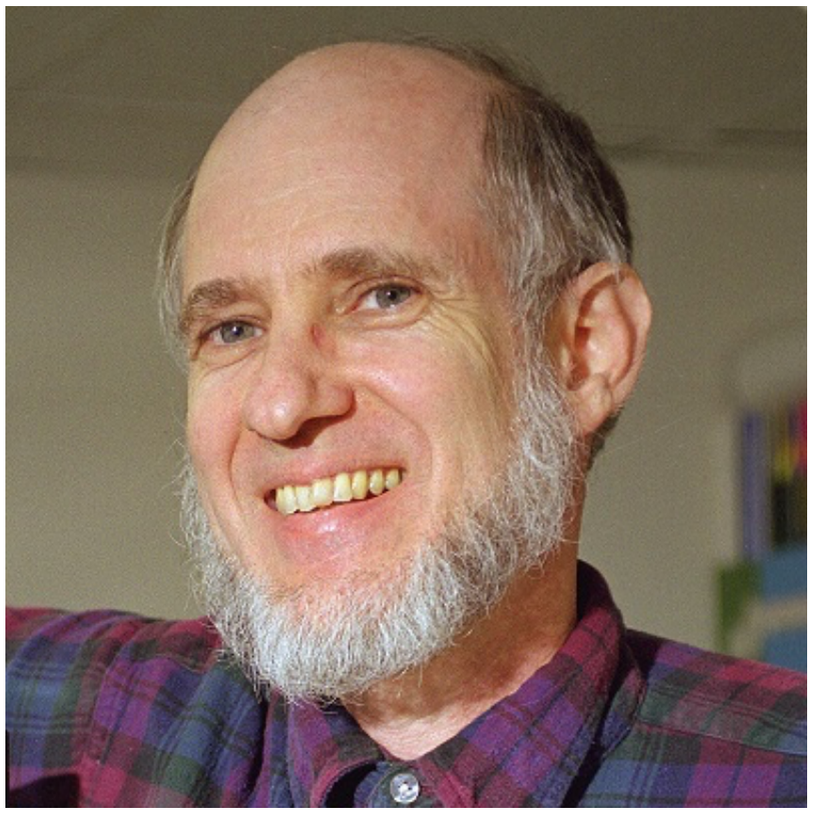
Circuit simulation via nonlinear systems

Parallel algorithms for nonlinear systems of equations

Interdisciplinary applications research (very broad topics)

Remote sensing and image processing

Contact Dr. Watson



Torg 2000

people.cs.vt.edu/ltw/shortvita.html

ltwatson@computer.org