

# Jonathan Cangelosi

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## EDUCATION

**Rice University**, Houston, TX

Ph.D. in Computational and Applied Mathematics, *expected* May 2025.

M.A. in Computational and Applied Mathematics, December 2022.

**Louisiana State University**, Baton Rouge, LA

B.S. in Mathematics (with honors), December 2019.

B.S. in Computer Science (with honors), December 2019.

## RESEARCH INTERESTS

Optimal control, trajectory optimization, adaptive surrogate modeling, model reduction

## TEACHING EXPERIENCE

**Undergraduate:** Lead tutor at the Center for Academic Success; tutored math and computer science courses spanning across the curriculum.

**Graduate:** Teaching assistant for an undergraduate course on numerical methods for PDEs. Responsibilities include holding a weekly recitation session and office hours. Also gave a few guest lectures. Currently pursuing the Certificate of Teaching Excellence at Rice, which includes a practicum and a portfolio.

## RESEARCH EXPERIENCE

**Research Assistant**, Rice University

Advisor: Dr. Matthias Heinkenschloss

Studying trajectory optimization for hypersonic vehicles under AFOSR MURI Grant FA9550-22-1-0004.

## SERVICE

**AWM Math Nights Volunteer**, Rice University

Assisted undergraduate students in applied mathematics courses such as calculus, matrix analysis, and numerical methods for PDEs.

**Graduate Seminar Organizer**, Rice University

Arranged research talks for graduate students in the department.

**Undergraduate mentorship, Rice University**

Mentored an undergraduate student studying feedback control systems.

**PRESENTATIONS**

**Technical paper presentation at AIAA SciTech 2024, Hyatt Regency Center, Orlando**

Title: Simultaneous Design and Trajectory Optimization for Boosted Hypersonic Glide Vehicles

Co-author: Jacob Needels, Stanford University

**Minisymposium presentation at SIAM-TXLA 2023, University of Louisiana at Lafayette**

Title: Adaptive Gaussian Process Modeling for Trajectory Simulation with Model Inexactness

**Poster presentation at RTG workshop 2023, Rice University**

Title: Adaptive Gaussian Process-Based Surrogate Modeling for the Simulation of Hypersonic Vehicle Trajectories

**Poster presentation at SIAM-TXLA 2022, University of Houston**

Title: Trajectory Optimization of Hypersonic Vehicles via a Radau Pseudospectral Method

**PUBLICATIONS**

**Towards an Adaptive Surrogate Model Refinement (ASMR) Framework for Trajectory Simulation and Optimization**

PhD thesis (tentative title). Work in progress. Expected completion date: May 2025.

**Sensitivity-Driven Adaptive Surrogate Modeling for Trajectory Simulation**

Technical paper (tentative title). Work in progress. Expected completion date: May 2024.

**Simultaneous Design and Trajectory Optimization for Boosted Hypersonic Glide Vehicles**

Technical paper. Published by AIAA SciTech 2024.

**Trajectory Optimization of Hypersonic Vehicles via a Radau Pseudospectral Method**

Master's thesis. Published by Rice University 2023.

**SKILLS**

Programming expertise in Python, particularly numpy, scipy, IPOPT, Jax, and Pyomo. Basic competence in MATLAB, C++, and Julia.