Joseph Tarriela

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EDUCATION

Georgia Institute of Technology *Atlanta, GA*

- Master of Science in Computer Science *2025-Present*

University of South Florida *Tampa, FL*

- Master of Science in Mechanical Engineering *May 2022*
  - *Specialization: Computational Fluid Dynamics*
- Bachelor of Science in Chemical Engineering *May 2020*

SKILLS

Primary Analysis Skills: Hydrocode, CFD, FEA, Optimization Methods, Data Visualization
Software Skills: CTH, ANSYS, COMSOL, ALE3D, LS-Dyna, CHEETAH, Dakota, Paraview, Tecplot, Linux
Optimization & ML: Multi-Objective Genetic Algorithms, Surrogate Modeling, Physics-Informed Neural Networks, Variational Autoencoders, CNNs, Cluster Analysis (k-means, DBSCAN), HPC/Parallel Computing (Linux clusters, Dask)
Languages: Python, Java, C++, C-Shell,

INDUSTRY EXPERIENCE **ACTIVE CLEARANCE**

Raytheon Missiles & Defense | Computational Mechanics Engineer *Remote (NYC) | Jun 2022 – Present*

- Computational Eulerian & ALE hydrocode/FEA modeling and optimization on HPC:
  - Shock physics, high-strain rate static/dynamic multibody deformation and energetic materials
- Directed optimization framework of novel History Variable Reactive Burn Model (HVRB) coefficients for energetics
  - Built two-stage surrogate pipeline (classifier/multi-output regressors) with LightGBM to fit HVRB models for gap/wedge tests
  - Developed 1-D reduced order regression routine using BCAT and CHEETAH along with reduced Euler equations to compute training data for physics-informed neural network
- Technical lead, generative warhead design optimization:
  - Built parallel software architecture for multi-objective optimization of fragment patterns, terminal flight conditions, and mass and trained a classifier to categorize patterns by warhead type
  - Implemented a neural-network-based global surrogate model for rapid optimization, incorporating free-form deformation (FFD) for geometric manipulations.
  - Implemented a variational autoencoder (VAE) to compress warhead geometries for CNN surrogate training, enabling design inference from fragment spray patterns and warhead types.
- Led multi-layered shaped-charge liner optimization, resulting in $1.2M IRAD funding.
- Conducted hydrocode investigations for flight termination system (FTS) failures.

Northrop Grumman Space Systems | Mechanical Systems Engineering Intern *Roy, UT | Jun 2021 – Aug 2021*

- Performed RANS/LES CFD simulations of air vehicle outer mold lines to characterize aerothermal heating

Johnson & Johnson Ethicon | Robotics R&D Co-Op *Blue Ash, OH | Jan 2021 – Apr -2021*

- Structural FEA optimization and sensitivity analysis to reduce stress along robotic endocutter stapler arm

Unbounded Labs (OTG) | Biomedical Engineer & Regulatory Specialist I *Tampa, FL | Dec 2019 – Oct 2020*

- Created detailed designs for systems, component assemblies and subsystem interfaces
- Created test plans, requirements and led execution for system and subsystem tests on multiple product lines

RESEARCH EXPERIENCE

BFBSM Lab at USF | Dr. Wenbin Mao | Graduate CFD Research Assistant *Tampa, FL I Aug 2020 – Aug 2022*

- Multi-fidelity CFD analysis (RANS, DES, LES) on heart pumps in Ansys Fluent focused on turbulence model resolution of stress fields and hemolytic effects

IBIS Lab at USF | Dr. Anna Pyayt | Undergraduate CFD Research Assistant *Tampa, FL I Sept 2018 – Jan 2021*

- Design and development of convective microfluidic CFD models validated with particle image velocimetry data
  - Published 1 peer-reviewed article, first author