

# Daniel Ryan

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## EDUCATION

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**North Carolina State University, Raleigh, NC**

Expected: May 2029

*Candidate for PhD in Applied Mathematics*

**Southern Methodist University (SMU), Dallas, TX**

May 2024

*B.A. Mathematics, B.A. Computer Science, B.A. Music, summa cum laude*

GPA: 3.95/4.00

## SKILLS

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- **Computer:** CoH3 | Qiskit | Tensorflow/Keras | Scikit-Learn | NumPy | WebGL | NodeJS | LaTeX | Matplotlib
- **Programming Languages:** C++ | Python | MATLAB | R | Java | SQL | Git/Github | Bash
- **Other:** Nuclear Data | HPCs | Network Flows | Quantum Computing | Machine Learning

## EXPERIENCE

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**Los Alamos National Lab, Los Alamos, NM**

June 2024 – Present

*Student Intern*

- Worked under XCP-5 to build and train machine learning models for predicting photonuclear data
- Performed sensitivity tests on CoH3, an optical model and Hauser-Feshbach model code, for simulating nuclear reactions to be used with EXFOR and TENDL data libraries for training models on high performance computing
- Attended lectures by LANL staff on various topics spanning computational physics research

**Department of Mathematics, SMU, Dallas, TX**

August 2023 – May 2024

*Research Assistant*

- Worked with Dr. Alejandro Aceves as a part of the Hamilton Undergraduate Research Scholars Program to explore and document importance advancements in quantum computing relevant to applied math research
- Summarized findings and implementations of common quantum algorithms using IBM's Qiskit toolkit in a report

**Department of Operations Research, SMU, Dallas, TX**

May 2023 – Present

*Research Assistant*

- Researched the Backhaul Profit Maximization Problem (BPMP), a Network Flows optimization problem, under Dr. Eli Olinick as a part of the Summer Undergraduate Research Fellowship
- Collaborated with a team of an undergraduate and post-doc to develop multiple greedy heuristic based algorithms and local searches using C++ and tested performance with network sizes of up to 200 nodes on HPC
- Made novel discoveries towards the development of faster algorithms with performance competitive to current state-of-the art mixed integer programming solvers with hopes for practical applications in third party logistics

**Department of Computer Science, SMU, Dallas, TX**

January 2023 – May 2023

*Research Assistant*

- Collaborated with the Department of Human Rights towards collecting and analyzing press releases from the governor's office, Department of Public Safety, and Texas Military Department relating to Operation Lone Star
- Designed a Python script to scrape articles spanning over a 2-year period to analyze potential bias in its use of language using word frequency analysis, n-gram analysis, and LDA topic modeling

**Department of Mathematics, SMU, Dallas, TX**

August 2023 – May 2024

*Grading Assistant*

- Graded quizzes and homework for Calculus 3 and helped students with course materials

**Hart Center for Undergraduate Leadership, SMU, Dallas, TX**

September 2022 – May 2023

*Student Ambassador*

- Assisted advisors and professors in day-to-day operations, setting up for recruiting events and career fairs, and helped coordinate engineering student programs

*IT Intern*

- Wrote 100+ pages of end user documentation for services used throughout the company and its clients
- Designed forms for HR and IT, created automated workflows for onboarding and IT ticket request management, and built a virtual help bot with 50+ topics to aid in basic troubleshooting

**HONORS AND AWARDS**

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**NC State Provost Fellowship** (2024) given to outstanding new doctoral students in their respective departments; **Charles J. Pipes Merit Award** (2024) given to one or more junior or senior students who have demonstrated excellence in mathematics; **SMU Honor Roll with Distinction** (2021-2024) given to top 10% of students; **Maguire Ethics Essay Competition Finalist** (2023) for essay with topics in AI ethical dilemmas; **SMU Distinguished Scholar** (2020)

**PUBLICATIONS**

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D. Ryan, T. Lam, Y. Dong, & E. Olinick, “Practical and Effective Heuristics for the Backhaul Profit Maximization Problem”, *in preparation*

**PRESENTATIONS**

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- “Applications of Machine learning in Nuclear Data Evaluation.” *Talk*. XCP Computational Physics Workshop Reception. Los Alamos, NM. August 2024
- “Practical and Effective Heuristics for the Backhaul Profit Maximization Problem.” *Conference Proceeding*. INFORMS Telecommunications and Network Analytics Conference. Dallas, TX. May 2024
- “Applied Mathematics Meets Quantum Mechanics.” *Talk*. SMU Hamilton Scholars Reception. Dallas, TX. April 2024
- “Practical and Effective Heuristics for the Backhaul Profit Maximization Problem.” *Poster Session*. SMU Undergraduate Research Symposium. April 2024
- “The Backhaul Profit Maximization Problem.” *Talk*. Summer Undergraduate Research Program reception. Dallas, TX. September 2023

**SERVICE**

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**Tau Beta Pi, SMU, Dallas, TX**

August 2023 – May 2024

*President*

- Aided in the reestablishment of the Tau Beta Pi engineering honors society with the SMU Student Senate and organized events for academically excelling engineering students to promote collaboration and community

**East Asian Student Association, SMU, Dallas, TX**

May 2021 – May 2022

*Treasurer*

- Oversaw financial records and allocated semester budgets of \$18,000 and budget requests for 6 events on-campus to help promote East Asian culture

**ACTIVITIES**

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- Sports: Hiking, rock climbing, bouldering
- Music: French horn, piano