Atticus D. Rex

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Education and Skills

Virginia Tech (Summa Cum Laude, Honors Laureate Diploma Recipient) (**May 2023)**

- B.S. in **Mechanical Engineering** (Cumulative GPA: 3.83 / 4.0)
- B.S. in **CMDA** (Computational Modeling and Data Analytics) (In-Major GPA: 3.91 / 4.0)
- Minors in **Mathematics, PPE** (Philosophy, Politics and Economics)

Skills and Certifications

- Fundamentals of Engineering (**FE Mechanical**) Certification
- Advanced proficiency in **Python, Java, SQL, C/C++, R, MATLAB, Git, Linux**
- Prototyping, FEA and CFD in Solidworks, Ansys, Siemens NX
- Spanish Fluency (Advanced Speaking, Reading, Writing)

Work Experience

Private Tutor (August 2020 – Present, ~8 hrs./wk)

- Private tutor in over 40 classes including Mathematics (Precalculus, Calculus, Differential Equations, Linear Algebra), Physics (Mechanics, Electricity, Magnetism, Optics, Thermodynamics), Computer Science, Spanish, and Visual Arts

Software and Data Science Intern in Riobamba, Ecuador (May 2022 – July 2022, ~50 hrs./wk)

- Software Development and Data Analytics lead for VT Agriculture and Applied Economics Research Group

Data Science for the Public Good Intern (May 2021 – August 2021, ~45 hrs./wk)

- Joint Symposia through Virginia Tech and the University of Virginia
- Analyzing Vegetative Health using **Convolutional and LSTM Neural Networks** on Multispectral Satellite Data
- Reconstructing a Multidimensional Poverty Index for Zimbabwe Statistical Agency

Mathematics Lecturer – VT SAASS (August 2021 – August 2022, ~6 hrs./wk)

- Held weekly open lectures in Precalculus, Business Calculus, Calculus I, II and Multivariable (Highest-paid Undergraduate Position at Virginia Tech)

Research

Optimal Shock Damping for Improved Controllability of Antenna Test Fixture (August 2022 – May 2023)

- Industry Sponsor: Naval Surface Warfare Center Dahlgren Division
- Technical Lead: responsible for design and validation, including FEA, dynamics, and electromagnetic simulation.
- Designed, validated, and implemented active control system to reproduce complex shock pulses.

Adapting Echo State Networks for Dynamical System Modeling (August 2022 – May 2023)

- Faculty Advisor: Serkan Gugercin, Ph.D.
- Investigated reservoir computing model for Extended Dynamical Mode Decomposition and modeling. Applied to various chaotic systems such as the Lorenz Attractor, Inverted Pendula.
- Compared results with existing frameworks such as SINDy and traditional DMD.

Eigenvalue Processing of Pendula Dynamics (January 2023 – May 2023)

- Faculty Advisor: Mark Embree, Ph.D.
- CMDA Capstone: Manufactured pendulum with multiple swinging masses, developed object tracking algorithm and theoretical framework to demonstrate eigenvalue analysis to future CMDA Math Modeling students.

Dopamine, Mimicry and Value Alignment: Artificial Intelligence and Addiction (January 2023 – May 2023)

- Faculty Advisor: Melinda Miller, Ph.D.
- PPE Capstone: Economics research applying research in neuroeconomics to the economic externalities and ethical violations caused by AI mimicking neuropleasurable experiences.

VT Motorsports Formula SAE (Aug 2019 – Sept 2021)

- Worked on Suspension Subteam developing bellcranks, laptime simulations, FEA, and many test schemes

Genetic Algorithm Neural Net Algorithm to Optimize Forex Trading (May 2021)

- Sold software to investment firm in San Francisco to develop automated intraday Foreign Exchange Trading

Extracurricular

Virginia Tech Honors College

- Taught reading seminar on Romantic-Era Poetry, completed Faculty-Student Agreements in Philosophy and Math
- Completed four investigations on Information Ethics, Political Realism, Big Nudging, and Dynamical Systems

Sigma Phi Epsilon Fraternity

- Academic Chair for SigEp Learning Community
- Consistently raised $30,000+ annually for Montgomery County Emergency Assistance Program (MCEAP)