

# Solving Problems with Data Science at Virginia Tech

## Summer REU 2024

### Data Sciences Project:

Data-Driven Methods for Science and Engineering (Ross Lab)

### Project Description:

Students working in the Ross Lab work on physics-based mathematical modeling, and data analysis for classification or prediction. For summer 2024, projects may include: (1) **Machine health monitoring using fractals and chaotic analysis**, (2) **Modeling of jumping, re-orientation, and landing in gliding animals**, (3) **orbital mechanics beyond GEO**, and (4) **autorotating airdrop delivery, a parachute-less approach inspired by maple seeds**.

### Expected Qualifications of Students:

Students from physics, applied mathematics, computational modeling, or engineering (mechanical, aerospace) preferred; familiarity with mathematical modeling, MATLAB or Python programming, and machine learning is a plus.

### Faculty Bio:

Dr. Shane Ross is a professor at Virginia Tech in Aerospace and Ocean Engineering. He has a B.S. in physics and a Ph.D. in applied mathematics (control and dynamical systems), both from the California Institute of Technology (Caltech). Working with students is his favorite part of the job. He's also worked at the University of Southern California, NASA/JPL, and Boeing.

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