

Paul Trusov

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EDUCATION

May 2028 **Cornell University**
B.S. Computer Science
Relevant Coursework: Data Structures, Linear Algebra, Discrete Mathematics, Multivariable Calculus, Computer Vision

EXPERIENCE

Cornell University, ASTRA Lab — Undergraduate Researcher Aug 2025 – Present
– Design and benchmark SVM, random forest, and XGBoost models to predict ionic-liquid suitability for electrospray thrusters.
– Build an interpretable screening workflow using SHAP to rank candidates and identify key chemical-property drivers for laboratory testing.

National Institutes of Health, NCBI — Special Volunteer Aug 2024 – Present
– Develop a random-forest classification model to analyze mass spectrometry data and improve peptide identification.
– Use dynamic programming to cluster complementary fragments of doubly charged peptides and improve identification reliability.

University of Houston, Health and Human Performance — Project Lead Feb 2024 – Aug 2025
– Developed an LSTM-based digital-twin framework to reconstruct healthy gait patterns and identify movement abnormalities.
– Trained models on more than 3,000 healthy gait cycles while accounting for individual differences in joint movement.

Temple Allen Industries, EMMA System — Software Intern Jun 2024 – Aug 2024
– Built a Python and Linux control module for the EMMA robotic arm, including communication, scheduling, and safety functionality.
– Prepared training data and supported model training and evaluation for robotic-arm control.

PROJECTS

GaitGuard — Co-Creator Nov 2025 – Present
– Built a wearable rehabilitation system that compares user movement with an ML-generated personalized “healthy twin” and provides real-time corrective feedback.
– Recognized at YHack and featured on the official Cornell Bowers Computing and Information Science website.

Foipal — Designer and Developer Jun 2021 – Jun 2023
– Built a wearable, ML-powered wingfoiling trainer that analyzes motion and provides real-time light cues to improve balance and reduce falls.
– Integrated an inertial measurement unit, GPS, LEDs, and a Raspberry Pi to collect movement data and adapt feedback based on previous riding patterns.

SELECTED PUBLICATIONS

Tahsin Abu Taqui Md, Paul Trusov, Abderrahim R. Bendimerad, and Elaine Petro. “Machine Learning to Predict Ionic Liquid Propellant Properties.” *AIAA SciTech Forum*, 2026.

Paul M. Trusov, Aleksey Ogurtsov, Oleg Obolensky, and Yi-Kuo Yu. “Comparative Analysis of Charge-State Determination Methods in Mass-Spectrometry-Based Proteomics.” *NIH Research Festival*, 2025.

Paul M. Trusov, Dacia Martinez Diaz, and Charles S. Layne. “Digital Twin-Based Controls in Gait Analysis: A Machine Learning Approach.” *International Journal of Physical Medicine & Rehabilitation*, 2024.

AWARDS & PROGRAMS

- Y Combinator Startup School, 2026
- Cornell Undergraduate Research Award, Boeing-funded (\$2,250)
- YHack, 3rd Overall (\$2,000)
- Dr. Vaccaro Research Scholarship
- IEEE Baltimore Robot Challenge, 1st Place

SKILLS

Languages Python, C/C++, Java, SQL, MATLAB, Bash
ML & Tools Scikit-learn, XGBoost, TensorFlow/Keras, SHAP, Git, Linux, ROS
Interests Wingfoiling, volleyball, swimming, chess