Hassan Shahid

ENGINEERING RÉSUMÉ

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PROFILE

High school engineering researcher focused on mathematical modeling in robotics, topology, stochastic systems, and electromagnetism. Author of three independent technical manuscripts, with hands-on experience assembling and testing radio hardware.

EDUCATION

Gainesville High School | Gainesville, FL • Expected graduation 2028

Completed coursework: AP Calculus AB, AP Calculus BC, AICE Physics AS
Current coursework: AICE Physics A-Level, AP Chemistry, AP Computer Science A, AP Microeconomics, AP Macroeconomics

SELECTED RESEARCH

Geometric Control, Actuator Feasibility, and Algebraic Equilibria in a Four-Wheel X-Drive Robot | Independent technical manuscript • 2026

- Modeled four-wheel robot kinematics and actuator limits using geometric control, Lie-group pose errors, and a Riemannian effort metric.
- Analyzed idealized controller stability and numerical cases; physical robot validation remains future work.

Persistent Homology and Stochastic Dynamics: Stability in Financial Modeling | Independent research manuscript • 2026

- Connected correlation-based persistent-homology features to stochastic price models; studied perturbation and model-path stability through analytical examples.

Topology in Electromagnetic Confinement: Literature Review and Conceptual Synthesis | Independent literature review

- Completed a conceptual synthesis of electromagnetic-confinement research and mathematical topology.

PRACTICAL EXPERIENCE

Radio Kit Assembly and Test | Personal project • Summer 2026

- Assembled a radio kit using supplied components and soldering equipment; confirmed successful signal transmission and reception.

INDEPENDENT VENTURE

Exodus Industries | Founder and CTO • 2026–present

- Developing the direction for a concept-stage aerospace engineering initiative focused on modular avionics and electronics.

TECHNICAL SKILLS

Analytical: Differential equations, rigid-body kinematics, geometric control, topological methods, stochastic modeling
Hardware: Soldering, radio assembly and functional testing, VEX V5 hardware familiarity
Research: Literature reviews, hand derivations, mathematical modeling, technical writing