

# Baurice Kovatchev

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## EDUCATION

**Brown University**, *B.Sc. Electrical Engineering*, 4.0/4.0 GPA  
*B.A. Economics*, 4.0/4.0 GPA

Providence, RI | **Expected Graduation May 2027**  
Tau Beta Pi Engineering Honors Society Inductee

Relevant Courses: Linear System Analysis, Control Systems, Electricity & Magnetism, Scientific Computing, Linear Algebra with Theory

## INDUSTRY EXPERIENCE

**Doppelmayr Cable Car**, *Hydraulics Intern*

Wolfurt, Vorarlberg, Austria | July 2025 – August 2025

- Constructed and optimized advanced hydraulic systems powering ski lift motors, emergency brakes, and rope-lifting mechanisms for the world's leading ropeway manufacturer, whose innovative transport solutions operate across all continents and climatic conditions.
- Collaborated within a six-person hydraulics engineering team to assemble and validate high-performance devices utilizing precision pumps and pistons and operating at 300 bar, capable of lifting loads exceeding 10 metric tons throughout their operational lifespans.
- Designed, executed, and led comprehensive safety, fatigue, and pressure-stability testing campaigns to verify operational integrity under extreme mechanical loads, ensuring zero system failures and enabling 100% deployment of manufactured units to ski lifts worldwide.
- Calibrated precision hydraulic monitoring and control devices to maintain long-term performance accuracy, durability, and compliance with stringent international safety standards, reinforcing the company's global reputation for reliability and engineering excellence.

**Mercedes-Benz**, *Production Intern*

Stuttgart, Baden-Württemberg, Germany | June 2024 – July 2024

- Owned three precision assembly stations within the Mercedes-Benz axle production line for AMG A-Class performance components.
- Maintained rigorous quality control standards by verifying component alignment and torque precision, and structural integrity, ensuring compliance with the company's exacting performance and safety and durability benchmarks. Contributed to large-scale manufacturing workflows enabling efficient production of over 6,000 axles, while strengthening operational consistency across the production line.
- Drove targeted process improvement initiative that reduced assembly downtime by 16%, significantly increasing station efficiency.

## CO-CURRICULAR EXPERIENCE

**Brown University Formula SAE Car Team**, *Drivetrain Lead / Electronics Member*

Providence, RI | March 2024 – Present

- Lead responsible engineer for full drivetrain system, from design through manufacturing, assembly, and on-track testing. Oversee 16 custom components including driveshafts, pillow blocks, bearings, engine and rear sprockets, and an adjustable-preload differential.
- Develop and run MATLAB-based lap-time and drivetrain simulations incorporating detailed models of torque delivery, gear ratios, wheel slip, and aerodynamic effects to optimize performance to optimize final gear ratio and acceleration profiles in dynamic events.
- Manage and mentor a seven-member drivetrain subteam, directing design reviews, machining operations, and validation testing. Teach new members MATLAB, controls, CAD, FEA, and CNC principles while maintaining strict team-wide timelines and quality standards.
- Integrate drivetrain data streams with vehicle ECU, enabling monitoring of torque, RPM, and wheel speed, enabling detailed post-run analytics and driver feedback. Analyze detailed race and simulation data to identify efficiency losses and optimize power delivery.
- Collaborate closely with electronics, engine, suspension, and chassis teams to synchronize electronic control strategies with mechanical performance, refine torque mapping, optimize vehicle traction, and develop predictive models for a wide range of racing conditions.
- Contributed advanced simulation fidelity, data-driven analysis, and sensor-integrated performance tuning that helped achieve a 10th place Endurance and 18th-place Overall finish at the 2025 FSAE competition in Michigan, the team's best performance in two decades.

**Wheeler School**, *High School Economics Teacher*

Providence, RI | October 2024 – August 2025

- Taught weekly lessons in macroeconomics, market theory, portfolio strategy, and personal finance to 30+ students. Developed a year-long curriculum focused on behavioral finance and real-life applications. Grew club from 0 students to the most attended at the school.
- Led club to 2nd and 3rd place finishes in the 2025 RI Economics and Personal Finance Challenges by emphasizing applied financial strategy and competition preparation. Ran a simulated portfolio management exercise using real-time data to teach risk-return tradeoffs.

**Nanoscale Physics and Quantum Devices Lab**, *Research Assistant*

Providence, RI | September 2025 – Present

- Engineer advanced precision noise-reduction circuits to minimize thermal, 1/f, and random telegraph noise in magnetic tunnel junction (MTJ) measurements, increasing detectability for highly sensitive studies of quantum tunneling and other spin-dependent phenomena.
- Advance the lab's goal of detecting ultra-small magnetic fields with high stability for next-generation brain wave detection applications.
- Streamlined the MTJ sample testing process by designing, developing, and deploying a custom PCB-based measurement system that reduced setup time, improved measurement stability, and was adopted as the new lab-wide standard for Faraday cage experiments.

**Brown Design Workshop**, *Monitor*

Providence, RI | December 2024 – Present

- Leads workshops on soldering and electronics, miter saw, table saw, bandsaw, planar, jointer, CNC mill, wood lathe, and 3D printing.
- Ensures the safety of workshop users and aids members with academic and personal projects. Guides tours for guests and newcomers.

**Brown University Club Ice Hockey Team**, *Assistant Captain / Treasurer*

Providence, RI | September 2023 – Present

- Leads 25-player roster, strengthening teamwork and on-ice discipline and driving a positive, competitive, and accountable team culture.
- Coordinates defensive structures and power play strategies, directly contributing to the team's competitive performance in games.
- Secures resources for the team by organizing fundraising events and building lasting partnerships with alumni and local supporters. Manages the team budget and collaborates with Club Sports Office to negotiate funding allocations, advocating for the team's needs.

## SKILLS AND INTERESTS

**Computer:** Proficient in MATLAB, Simulink, Java, KiCad, PCB design, SolidWorks, CAD, LTspice, Fusion 360, CAM, Arduino, soldering, DAQ systems, oscilloscope, Microsoft Office/Excel spreadsheets, Google Workspace, Adobe Photoshop, GitHub. Intermediate in Python, C.

**Languages:** Native English and German. Proficient in Bulgarian and the Cyrillic alphabet. Beginner in Spanish.

**Cabin Construction:** Built a 12'x18' off-grid cabin with loft, bed, living area, kitchen, and deck for leisure, overnight stay, and tool storage.

**Cello:** Member of a chamber music group, currently playing the Ravel String Quartet in F Major and the Dvořák Quartet No. 12 "American".