Dmitriy Pautov

dpautov.com | dpautov2@illinois.edu | 847-505-2215

Physics & Electrical Engineering Student, University of Illinois Urbana-Champaign. Focused on beyond standard model (BSM) and solid-state physics, with interests in RF systems, meteorology, and instrumentation design and standards.

WORK EXPERIENCE

Physics Intern, Gabrielse Group at Northwestern University Evanston, IL | Jun 2023 – Aug 2023

- Contributed to the most precise measurement of the electron's magnetic moment to explore new physics.
- Updated a 20-year-old bandpass filter, increasing resolution to 16 bits, sampling speed 3x, and FFT computation speed 8x. Designed a circuit board with an advanced microcontroller (STM32H7) for signal processing, enabling faster and more precise measurements. Added Ethernet, USB-C, and an LCD for easier use in future research.
- Assembled, cleaned, and tested components for cryogenic and high-vacuum systems.
- Worked with students and professors, presented findings, and collaborated on ongoing projects.

Project Lead, UIUC EV Concept Car Urbana, IL | Aug 2024 – Present

- Lead a 5 person team to implement regenerative and rheostatic braking systems for an electric vehicle prototype.
- Designed multiple PCBs in KiCad, including aluminum boards handling over 30A and 4-layer controller PCBs.
- Implemented CAN bus, STM32 microcontrollers, 30A buck converters, 3kw resistor bank, and more.
- Participating in the 2024 Shell Eco-marathon, fostering innovation in the electric car automotive field.

Assistant Tutor, CS124 at UIUC Urbana, IL | January 2025 - Present

- Provided one-on-one and group support to help students master programming in Java & OOP programming.
- Created and refined course materials, including video explanations of problems and learning resources.

SELECTED PROJECT

Turbomolecular Pump Driver

- Created a custom variable frequency & voltage inverter for driving Turbomolecular Vacuum Pumps (TMPs).
- Designed a mains voltage-powered PCB, centered around an STM32 MCU controlling a 6-step inverter powered by 120VDC with a PWM signal. Speed & Temperature Control is achieved through the back EMF of the TMP.
- Implemented a control algorithm in C++ for ramp-up; guaranteed that TMP could not crash due to circuit failure.
- Over a dozen successful pump downs to <10^-6 Torr, with no vibration of TMP at full speed.

EDUCATION

University of Illinois Urbana-Champaign Champaign, IL | Expected May 2028
Physics, B.S. & Electrical Engineering, B.S.

Adlai E. Stevenson High School Lincolnshire, IL | May 2024
High School Diploma

Relevant Coursework
Introduction to Computing, Introduction to Electronics, Introduction to Computer Science I, Multivariable Calculus, Linear Algebra, Differential Equations, Statistics, Relativity, Mechanics, Electricity and Magnetism, Quantum Physics, Thermal Physics, General Chemistry

SKILLS

Technical: CAD modeling with Inventor & Fusion 360, Analog & Digital Circuit Design, Circuit Simulation with LTspice, PCB Layout with KiCAD, LaTeX
Programming: Java, Embedded System Programming with C++, LABVIEW, Android Studio, Python, NumPy, SciPy, matplotlib
Languages: Native fluency in English and Russian; Basic Proficiency in Spanish