

Paul Pham

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EDUCATION

Washington University in St. Louis | Bachelor of Science in Electrical Engineering | *Expected May 2029*

- Intended Minor: Computer Science, Philosophy
 - Relevant Coursework: Calculus 1 - 3, Physics I, Linear Algebra, Differential Equations and Dynamical Systems Modeling, Digital Logic and Computer Design, Physics II
 - Activities: WashU Design, Build, Fly (DBF) - Avionics Team, Vietnamese Student Association (VSA), WashU Badminton Club
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RELEVANT PROJECTS

Handwritten Digit Classification | *Sept 2025*

- Developed a K-means clustering algorithm in MATLAB to interpret and classify a dataset of 1500 handwritten digits, achieving 71.5% accuracy with a new set of data with 200 digits.
- Implemented centroid initialization techniques such as the 'elbow method' to determine the optimal clustering (k=18).
- Designed a statistical data outlier detection strategy based on cluster distance thresholds.

Discrete-Time State-Space Circuits as Resonators, Sensors, & Filters MATLAB Simulations | *Nov 2025*

- Modeled RLC circuit physical dynamics using a discrete-time state-space approach in MATLAB to analyze how component values control damping and oscillation.
- Designed specific frequency domain filters for audio applications, including a resonator emulating a tuning fork, as well as a band-pass filter to denoise music files.
- Engineered a targeted sensor algorithm to isolate specific frequencies, such as an 84 Hz rotor sound.

Linear Optical Imaging & Holographic Reconstruction | *Dec 2025*

- Developed a linear optical simulation in MATLAB using 4x4 ray transfer matrices to model the propagation of over 3 million light rays through free space and thin lenses.
 - Implemented a K-means clustering algorithm to separate ray angles, successfully identifying and reconstructing three hidden holographic objects from a computational light field.
 - Applied image processing techniques, including Laplacian scoring and Contrast Limited Adaptive Histogram Equalization (CLAHE), to optimize focus and resolve grainy features.
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LEADERSHIP & ENGINEERING EXPERIENCE

1st Place | WashU Biomedical Engineering Competition | *Apr 2024*

- **Project:** "The Pilliken" - An automated pill dispenser paired with a mobile app created to improve medication adherence among 16.8% of the total population of the U.S., the elderly.
- **Design:** Spearheaded a cost-effective, single motor radial dispensing mechanism with a replaceable 10-vessel chute system.
- **Product Strategy:** Executed a business strategy, proposing the device as a Medicare-funded Durable Medical Equipment (DME) to address financial barriers for low-income patients.
- **Impact:** The design handles complex medication schedules with a simplified user interface, directly addressing the targeted user population's dexterity and memory limitations.

Project Lead | WashU Gateway Arch Engineering Competition | *Nov 2024*

- Led a team to design an ADA-compliant pedestrian bridge connecting the Arch grounds' North Overlook to the historic Eads Bridge, solving a major accessibility gap.
- Engineered a model that was up to strict anti-terrorism security protocols and preserved the integrity of the Eads Bridge's limestone anchors.
- Constructed a comprehensive \$977k budget and construction schedule, presenting physical CAD models to a board of professional judges.

Academic Mathematics & English Tutor | Sigel Elementary School | *Jan 2025*

- Mentored 25+ students across grades K-6, with a primary focus on the 4th-grade curriculum, transforming complicated math concepts and reading comprehension into accessible lessons for all students.
 - Managed classroom engagement and provided one-on-one mentorship to enhance students' problem-solving skills.
 - Adapted teaching strategies to support diverse age groups, improving overall student comprehension and confidence.
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TECHNICAL SKILLS

- **Programming:** MATLAB, Java (OOP), LaTeX, Python (Scripting), Python
- **Hardware & Embedded:** Raspberry Pi
- **Software and Tools:** Circuit Simulation, GitHub
- **Core Concepts:** Linear Algebra, Vector Calculus, Electrochemistry, State-Space Modeling