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Kavi Dey

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Education

Harvey Mudd College (HMC) — **Claremont, CA** — **Aug 2022 – May 2026**
- B.S. in Computer Science

Seattle Academy High School (SAAS) — **Seattle, WA** — **Jan 2019 – June 2022**
- High School Diploma, High Honor Roll

Employment

Summer 2023 — **Audio Information Retrieval** — **Prof. Tsai, MIR Lab, Harvey Mudd College**

Goal: To train large language models to understand and classify music data; Audio tampering detection
- Developed novel online alignment algorithms for 3 way audio alignment of piano concertos
- Lead data collection and created new audio tampering detection systems
- One publication in preparation

2020-2022 — **Robotic Tele-Operation** — **Prof. Cakmak, HCR Lab, University of Washington**

Goal: To develop accessible robot tele-operation interfaces
- Performed data analysis of user studies [IEEE RO'MAN 2021 Paper].
- Led interface design and studies of interface alternatives. Co-first authored [IEEE IROS 2021 Co-First Authored Paper].
- Led research in programming by demonstration & human-in-the-loop object grasping and manipulation approach
- Mentored 5 undergraduates across 3 different projects

Other Internships and Research

2024 — **Variational Deep Learning** — **Prof. Hope, Hope Lab, HMC**

Goal: Learned about and implemented SVAEs with a variety of priors. Integrated S4/S5 models with linear dynamical system prior in SVAE. Working towards publication

2023 — **Embedded Programming** — **Prof. Spencer, ACE Lab, HMC**

Goal: Revise and test ultrasonic beam forming sonar sensor. Led low level embedded development on SAM-4 MCU. Implemented embedded communication protocol for talking to an Ethernet chip using SPI

2022 — **Zero-shot Image Classification** — **Prof. Carr-Markell, Bee Lab, HMC**

Goal: Pollen detection and classification (translational ML work with biologists)
- Trained zero shot classifier using Siamese Net & ResNet transfer learning.
- Developed public website to share the model and blog post explaining the basics of siamese nets and auto encoders.

2020-2021 — **Full Stack Web Development** — **WA State Hospital Association**

Goal: Develop custom Personal Protective Equipment exchange website to help address COVID shortages. Engineered custom PPE-Distribution algorithm with input from MultiCare Hospital.

2019 — **Deep Learning** — **Prof. Froehlich, Makeability Lab, UW**

Goal: Integrate deep learning into curb-ramp detection to improve temporal tracking of sidewalk quality to improve transparency about sidewalk accessibility [ACM ASSETS 2021 Poster]

2018 — **Voice Activity Detection** — **Adobe**

Goal: Develop ultra-lightweight ML speech detection classifier for Character Animator. Added to developer credits

Publications

Ather Sharif, Paari Gopal, Michael Saugstad, Shiven Bhatt, Raymond Fok, Galen Weld, **Kavi Dey**, and Jon E. Froehlich. Experimental crowd+ai approaches to track accessibility features in sidewalk intersections over time. In Jonathan Lazar, Jinjuan Heidi Feng, and Faustina Hwang, editors, *ASSETS Adjunct Proceedings*, pages 65:1–65:5. ACM, '21. doi: 10.1145/3441852.3476549. URL https://doi.org/10.1145/3441852.3476549

Maria E. Cabrera*, **Kavi Dey***, Kavita Krishnaswamy, Tapomayukh Bhattacharjee, and Maya Cakmak. Cursor-based robot tele-manipulation through 2d-to-se2 interfaces. In *IEEE/RSJ IROS*, pages 4230–4237. IEEE, '21. doi: 10.1109/IROS51168.2021.9636008. URL https://doi.org/10.1109/IROS51168.2021.9636008. *Co First Authors

Maria E. Cabrera, Tapomayukh Bhattacharjee, **Kavi Dey**, and Maya Cakmak. An exploration of accessible remote tele-operation for assistive mobile manipulators in the home. In *30th IEEE RO-MAN*, pages 1202–1209. IEEE, '21. doi: 10.1109/RO-MAN50785.2021.9515511. URL https://doi.org/10.1109/RO-MAN50785.2021.9515511

Significant Projects

2020-2023 **Electronic Speed Control (ESC) Design** **SAAS**

Goal: Design and manufacture custom brushless motor ESC. Led team (3 high school students); Taught college level electrical engineering and brushless motor control theory, schematic design, PCB design, microcontroller programming

2019-2022 **Team Lead; ECE Lead** **MATE & FRC Robotics, SAAS**

Goal: Build for and compete in national robotics competitions

- Led 30+ person team in remote and in person settings with focus on culture, education and diversity
- Developed multi-node realtime communication system and UI, enhanced documentation and process, led team effort to build underwater robot.

2022-2023 **Compiler & Silicon Design** **HMC**

Goal: Design and implement a C to assembly compiler and associated processor in Verilog

- Designed and implemented a compiler for a subset of C. Compiler supports control flow, recursion, register allocation, and stack allocation.
- Designed a processor in Verilog with support for the compiler's assembly language

Languages and Technologies

- **Expert:** Python, Typescript, Svelte, Pytorch, JAX,Pandas/Matplotlib
- **Intermediate:** THREE.js, C++, ROS, Unix, Compiler Design, LaTeX, Verilog, MATLAB
- **Engineering:** Schematic Capture, Board Layout, Altium, I2C, Trapezoidal and Field-Oriented ESC Design, PIC Programming, MOSFETs, Solidworks
- **Advanced studies including:** Real Analysis; Linear Algebra; Multivariable Calculus; Quantum Theory; Inverse Kinematics; Optimization; Machine Learning; Quantum Mechanics; Variational Baysian Methods

Additional Experience and Awards

2024 **Astronaut Scholarship Nominee**
2023 **HMC Davies Engineering Prize**
2022 **Harvey S. Mudd Merit Award**
2021 **World Championship Top 10** MATE Telepresence Competition
2020 **Rookie All Star Award**, FRC: Redshift 8032
2020 **FRC Dean's List Semi-Finalist**
2018 **Regional Competition Top 5** MATE Pacific Northwest Region