

Anna Kay

MSTP STUDENT · COMPUTER SCIENCE AND ENGINEERING

✉ ankhos@umich.edu

My research focuses on computer vision and its applications to healthcare with current projects in understanding the progression of age-related macular degeneration and improving data representations. I previously worked on landmark detection for hip displacement surveillance and analyzed disparities in pediatric emergencies. As an undergraduate, I studied renal aquaporin trafficking through a cell biology lens.

Education

University of Michigan

2021 - present

MEDICAL SCIENTIST TRAINING PROGRAM

GPA 4.0/4.0

- PhD department: Computer Science and Engineering
- Advisor: Prof. Stella Yu

Massachusetts Institute of Technology

2016 - 2021

PHYSICS (8), CHEMISTRY AND BIOLOGY (5-7)

GPA 5.0/5.0

- Minors: economics, computer science

Select Presentations

** equal contribution*

EXTERNAL CONFERENCES

- A. Kay**, J. Miller, S.X. Yu. Segmentation of early-stage reticular pseudodrusen with limited annotations. Association for Research in Vision and Ophthalmology: Imaging in the Eye. (Format to be decided, 2025)
- A. Kay**, J. Krogue, M. Firtha, P. Donohue, M. Villalba, S.X. Yu, V.A. Kulkarni. HipScreen AI: Artificial Intelligence Algorithm Accurately Measures Migration Percentage on Hip Surveillance Radiographs Acquired from a Mobile Device. American Academy for Cerebral Palsy and Developmental Medicine Annual Meeting. (Podium, 2024, top-10 paper)
- M. Nguyen*, **A. Kay***, K. Miller, Y. Paulus. The impact of race on pediatric eye-related injuries in school and daycare. American Academy of Ophthalmology. (Poster theater, 2023)
- A. Kay***, M. Nguyen*. Pediatric emergency room visits for eye-related injuries in school and daycare: trends from 2003-2022. Women in Ophthalmology. (Poster, 2023)

INTERNAL CONFERENCES

- A. Kay**, J. Miller, S.X. Yu. Self-supervised learning of retinal changes in age-related macular degeneration. Vision Research Retreat. (Highlight/oral, 2024)

TALKS

- Feature learning: Training and understanding your AI**. Department of Computational Medicine & Bioinformatics: Tools and Technology Seminar Series. <https://www.youtube.com/watch?v=Sn1vhuigSWw>. (2024)

UNDERGRADUATE

- A. Khoroshilov**, C. Paunescu, S. Cheung, A. Nair, R. Bouley, D. Brown. Phosphorylated forms of AQP2 are re-distributed onto intracellular vesicles after colchicine mediated microtubule disruption in renal epithelial cells. KUH Summer Undergraduate Research Conference. (Poster, 2019)
- A. Khoroshilov**, M.L. Antony, K. Noble-Orcutt, K. Sachs, Z. Sachs. Effect of Mebendazole Dependent Myb Inhibition in NRAS Mutant AML. Molecular Biology of the Cell, 29 (26), 3063 (abstract P1316). <https://doi.org/10.1091/mbc.E18-10-0647>. (Student poster competition, 2018)

Outreach & Professional Development

MENTORSHIP

- 2023-curr. **Explore CS Research Team**, research mentor to undergraduate senior
Project: contrastive learning for ancient coin classification
- 2017-curr. **International Olympiad on Astronomy and Astrophysics**, team Canada leader (2017-2019),
now consultant role
- 2023-2024 **UM-INSPIRE**, mentor to undergraduate sophomore
- 2021-2022 **Doctors of Tomorrow Foundations**, capstone leader for grades 9-10

SERVICE

- 2024-curr. **University of Michigan Medical School Admissions Committee**, interviewer
- 2023-curr. **Diversity in Medicine Conference**, finance director
- 2023-curr. **MSTP Justice Diversity Accessibility Equity task force**, member
- 2023 **UM CSE internal reviewer**, for Computer Vision and Pattern Recognition
- 2022 **Medical Educational Consulting Group Student Impact Symposium**, organizer
- 2021-2022 **Galens**, financial allocations committee, Tag Days volunteer
- 2021-2022 **University of Michigan Medical School Admissions**, SLounge coordinator

LEADERSHIP

- 2024-curr. **Ophthalmology Student Interest Group**, director of research and education
- 2022-curr. **Michigan Journal of Medicine**, editor
- 2021-curr. **Medical French**, vice-president
- 2023 **Clinical Assessment Task Force**, student representative
- 2022-2023 **Michigan Ophthalmology Pipeline**, co-president
- 2021-2022 **American Medical Women's Association**, president
- 2021-2022 **Wolverine Street Medicine**, education coordinator
- 2021-2022 **Medical Education Consulting Group**, team leader

TEACHING

- Fall 2024 **EECS 524 Advanced Computer Vision**, graduate student instructor

Select Undergraduate:

- Fall 2019 **8.012 Physics I: Classical Mechanics**, office hours lead
- Fall 2018 **8.02 Physics II: Electricity and Magnetism, Seminar XL**, instructor
- 2017-2018 **Science Club for Girls**, rocket team mentor

Grants & Training Programs

- 2025 **CI Pathways program (NSF award 2417789)**, Parallel Computing Pathway
- 2024 **e-HAIL: E-Health & Artificial Intelligence**, Dataset Creation Award
- Nov 2019 **American Society of Nephrology**, Kidney STARS program
- 2017-2019 **Emerson Scholar**, Piano Performance / Vocal Performance

Languages

- Russian (native)
- French (near native/fluent)
- Spanish (DELE C1)

Research Journal Publications

** equal contribution*

UNDER REVIEW

K. Miller, K. Reddy, **A. Kay**, M. Nguyen, R. Issa, L. Juratli, M. Johnson Griggs, M. Yacim, A. Elam, A. Sugar, S. Mian, A. Kaplan. Michigan Ophthalmology Pipeline: Five Years of Aiming to Increase Diversity in Ophthalmology. *Journal of Academic Ophthalmology*.

UNDERGRADUATE

M. L. Antony, D. Chang, K. Noble-Orcutt, **A. Kay**, J. L. Jensen, H. Mohei, C. Myers, K. Sachs, Z. Sachs. CD69 marks a sub-population of acute myeloid leukemia with enhanced colony forming capacity and a unique signaling activation state, *Leukemia & Lymphoma* (2023), <https://doi.org/10.1080/10428194.2023.2207698>.

P. Cheung*, M. Boukenna*, R. Babicz, S. Mitra, **A. Kay**, T. Paunescu, N. Baylor, L. Chen-Chung, A. Nair, R. Bouley, D. Brown. Intracellular sites of AQP2 S256 phosphorylation identified using inhibitors of the AQP2 recycling itinerary, *American Journal of Physiology-Renal Physiology* (2023), <https://doi.org/10.1152/ajprenal.00123.2022>.

C. Chiou, M. Wang; E. Taniguchi, R. Nascimento e Silva, **A. Khoroshilov**, D. Li, H. Wang, S. Greenstein, S. Brauner, A. Turalba, L. Pasquale, L. Shen. Characterization of Prelaminar Wedge-Shaped Defects in Primary Open Angle Glaucoma, *Current Eye Research* (2020), <https://doi.org/10.1080/02713683.2020.1836229>.

Other Conference Presentations

** equal contribution*

CASE STUDIES

O. Lee, **A. Kay**, H. Hakim, M. Nakamura. A man with a painful rash (Rowell Syndrome). Michigan Dermatological Society meeting. (Case write-up, 2024)

A. Kay, K. Leonard. Unilateral laterothoracic exanthem in a young adult. Michigan Dermatological Society meeting. (Case write-up, 2022)

MEDICAL STUDENT EDUCATION

K. Reddy, K.D. Miller, **A. Kay**, M. Nguyen, R. Issa, L. Juratli, M.A. Johnson-Griggs, M. Yacim, A. Elam, A. Sugar, S.I. Mian, A. Kaplan. Advancing Diversity in Ophthalmology: Analyzing a Single Institution's Minority Pipeline Program. *Invest. Ophthalmol. Vis. Sci.*, 65(7):4193. <https://iovs.arvojournals.org/article.aspx?articleid=2795721>. (Poster, 2024)

K.D. Miller, K. Reddy, M. Nguyen, **A. Kay**, M.A. Johnson-Griggs, L. Juratli, M. Yacim, R. Issa, A. Sugar, S.I. Mian, A. Kaplan. Factors Considered by Medical Students in Choosing a Medical Specialty and Whether to Pursue Ophthalmology. *Invest. Ophthalmol. Vis. Sci.*, 65(7):4210. <https://iovs.arvojournals.org/article.aspx?articleid=2798907>. (Poster, 2024)

M. Nguyen, K. Miller, **A. Kay**, M. Johnson-Griggs, S. Mian, A. Kaplan. Medical Student Barriers to the Pursuit of a Career in Ophthalmology. *Rabb-Venable*. (Poster, 2023)

LANDMARK DETECTION FOR HIP DISPLACEMENT

V.A. Kulkarni, C. Yeh, J. Krogue, **A. Kay**, M. Firtha, P. Donohue, M. Villalba, S. Jeon, S.X. Yu. Deep-Learning Quantification of Hip Displacement in Children with Cerebral Palsy: Validation on International Radiographic Set from 24 Centers. *American Academy for Cerebral Palsy and Developmental Medicine Annual Meeting*. (Podium, 2023)

C. Yeh, **A. Kay**, S. Jeon, P. Donahue, M. Villalba, J. Krogue, S.X. Yu, V.A. Kulkarni. Automated measurement of migration percentage in hip surveillance radiographs. *e-Health and Artificial Intelligence symposium*. (Poster, 2023)

AI IN OPHTHALMOLOGY

A. Kay, J. Miller, S.X. Yu. Segmentation of reticular pseudodrusen with limited annotations. *AAP/ASCI/APSA Joint Meeting*. (Poster, 2025)

A. Kay, M. Nguyen. Transfer learning with VGG16 deep convolutional neural network model effectively differentiates between subtypes of bright and dark lesions. *Invest. Ophthalmol. Vis. Sci.*, 64(8):242. <https://iovs.arvojournals.org/article.aspx?articleid=2790696>. (Poster, 2023)

PEDIATRIC OPHTHALMIC EMERGENCIES

M. Nguyen*, **A. Kay***. The impact of race on eye emergencies across ages. *Invest. Ophthalmol. Vis. Sci.*, 65(7):2435. <https://iovs.arvojournals.org/article.aspx?articleid=2797448>. (Poster, 2024)

UNDERGRADUATE

R. Bouley, M. Boukenna, **A. Khoroshilov**, C. Paunescu, S. Cheung, D. Brown. AQP2 pSer256 phosphorylation in the plasma membrane, cytoplasmic vesicles and trans Golgi identified using inhibitors of the AQP2 recycling itinerary. ASN Kidney Week Conference. (Poster, 2019)

A. Khoroshilov, B. Burgos, B. Bloem, A. Graybiel. Comparing the reward-based learning of matrix and striosome Cre-expressing transgenic mouse strains in an optogenetic self-stimulation experiment. Campus Preview Weekend Research Expo. (Poster, 2018)