Anna Kay

MSTP Student · Computer Science and Engineering

✉ ankhoros@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=Snlvhuig5Ww`. (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
2024-curr.	**CSE faculty search visits**, graduate student host
2023-curr.	**Diversity in Medicine Conference**, finance director
2023-curr.	**MSTP community**, Justice Diversity Accessibility Equity task force	ethics committee
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

Select Undergraduate:

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)