Anastasios N. Angelopoulos

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Statistics for reliable machine learning and computer vision, with applications to medical and computational imaging.

Education

University of California, Berkeley — Ph.D., Electrical Engineering & Computer Science
GPA: 4.00/4.00, Advisors: Michael I. Jordan, Jitendra Malik — 2019–Current

Stanford University — B.S., Electrical Engineering
GPA: 4.00/4.00, Advisors: Stephen Boyd, Gordon Wetzstein — 2016 –2019

Publications

[1] **A. N. Angelopoulos** and S. Bates, "A Gentle Introduction to Conformal Prediction and Distribution-Free Uncertainty Quantification", 2021.

[2] **A. N. Angelopoulos**, S. Bates, E. J. Candès, M. I. Jordan, and L. Lei, "Learn then test: Calibrating predictive algorithms to achieve risk control", *arXiv preprint arXiv:2110.01052*, 2021.

[3] **A. N. Angelopoulos**, S. Bates, L. Lei, J. Malik, and M. I. Jordan, "Distribution-Free, Risk-Controlling Prediction Sets", *Journal of the ACM (to appear)*, 2021.

[4] **A. N. Angelopoulos**, S. Bates, J. Malik, and M. I. Jordan, "Uncertainty Sets for Image Classifiers using Conformal Prediction", *International Conference on Learning Representations*, 2021, Spotlight oral.

[5] **A. N. Angelopoulos**, S. Bates, T. Zrnic, and M. I. Jordan, "Private Prediction Sets", *arXiv preprint arXiv:2102.06202*, 2021.

[6] **A. N. Angelopoulos**, A. Kohli, S. You, and L. Waller, "Shift-Variant Deblurring for Rotationally Symmetric Systems", *Computational Optical Sensing and Imaging, Optical Society of America*, 2021.

[7] **A. N. Angelopoulos**, J. N. Martel, A. P. Kohli, J. Conradt, and G. Wetzstein, "Event-Based, Near-Eye Gaze Tracking Beyond 10,000Hz", *IEEE Transactions on Visualization and Computer Graphics*, 2021, Oral at IEEEVR conference and TVCG special issue.

[8] **A. N. Angelopoulos**, R. Pathak, R. Varma, and M. I. Jordan, "On Identifying and Mitigating Bias in the Estimation of the COVID-19 Case Fatality Rate", *Harvard Data Science Review*, Special Issue 1 2020.

[9] R. Konrad, **A. N. Angelopoulos**, and G. Wetzstein, "Gaze-Contingent Ocular Parallax Rendering for Virtual Reality", *ACM Transactions on Graphics (TOG)*, vol. 39, no. 2, pp. 1–12, 2020.

[10] **A. N. Angelopoulos**, H. Ameri, D. Mitra, and M. Humayun, "Enhanced Depth Navigation Through Augmented Reality Depth Mapping in Patients with Low Vision", *Scientific Reports, Nature Publishing Group*, vol. 9, no. 1, pp. 1–10, 2019.

[11] **A. N. Angelopoulos**, *Universal Pickup*, US Patent 8,993,868, Mar. 2015.

Scholarships and Awards

1. NSF Graduate Research Fellowship — 2021–2024
2. Berkeley Fellowship — 2019–2021

3. Frederick Emmons Terman Award (Top 30 at Stanford) 2019
4. Phi Beta Kappa 2019
5. Tau Beta Pi 2019
6. Departmental Distinction in Electrical Engineering 2019
7. National Merit Scholar 2016–2019
8. US National Debate Champion, Member of US National Debate Team 2013–2016

Industry Experience

MHR Vision Los Angeles, CA
Founder, with Ming Hsieh, Mark Humayun, and Rohit Varma 2018-today

- Diagnosing people's eyeglass prescriptions from a smartphone.
- Myopia currently afflicts 1.9 billion people; this number will double in the next twenty years. Not enough optometrists are being trained to keep up with the demand, particularly in populous nations like China and India, creating a need an automated screening and diagnostic tool in those markets. MHR Vision has built an app that has redesigned standard optometric tests using computer vision to work on a smartphone, and validated these tests in a several hundred-person clinical trial over two clinical sites in Los Angeles. I led a nine-person technical team towards the software development and clinical experimentation for this product.

International Space Station + USC Los Angeles, CA
Co-Investigator November 2018-Summer 2020

- This project investigated why astronauts go blind in space by sending mice to the ISS as an animal model and examining their eye, brain, and middle ear after months of micro-gravity exposure.
- The mice were successfully sent to space, euthanized, frozen, and returned. However the sample analysis has been delayed by a combination of the COVID-19 pandemic and spaceflight-related issues you can read about in the national news here. I led the grant and scientific plan for this project which will soon resume.

Hypernet Labs Palo Alto, CA
Second Engineer 2017-2018

- Buy, sell, and use compute from anywhere.
- Hypernet Labs built a blockchain technology for dynamically buying and selling compute. I was their second engineering hire, and built their early network tunneling codebase.

Golden Eye Bionics Pasadena, CA
Software Engineer Summer 2018

- Software engineering for prosthetic retina.
- Golden Eye Bionics is a startup developing a high-resolution prosthetic retina—a 16x16 array of electrodes that can be surgically attached to the optic nerve and restore vision to the blind. I worked on software to model the patient's vision after implantation, including the size and shape of the visual percepts generated by electrodes, and algorithms to process video and improve the patient's VA and functional vision.

Camtek Pasadena, CA
MEMS Engineer Summer 2018

- Manufacturing intra-ocular eye pumps.
- I manufactured parylene intra-ocular eye pumps using industrial tools like photolithography and polymer deposition. I also built a system that automatically identifies manufacturing errors in the pumps using computer vision and a camera-enabled microscope.

Service

1. **Organizer** of ICML Workshop on Distribution-Free Uncertainty Quantification 2021
2. **Reviewer** for Biometrika, the Harvard Data Science Review, ICML, PLOS One, SIGGRAPH 2021, SIGGRAPH Asia 2021, NeurIPS 2021, and Scientific Reports

Formal Talks

1. Distribution-Free Risk-Controlling Prediction Sets, Allstate Insurance Group, 2021
2. Uncertainty Sets for Image Classifiers Using Conformal Prediction, Allstate Insurance Group, 2021
3. Distribution-Free Risk-Controlling Prediction Sets, Berkeley ML-MRI Seminar, 2021
4. Distribution-Free Risk-Controlling Prediction Sets, MIT CSAIL CSL Seminar, 2021 https://www.youtube.com/watch?v=z8WDmD5D-I0
5. Distribution-Free Risk-Controlling Prediction Sets, EPFL ML and Vision Reading Group, 2021
6. Uncertainty Sets for Image Classifiers using Conformal Prediction, ICLR 2021 Spotlight Oral, 2021
7. Event-Based Near-Eye Gaze Tracking Beyond 10KHz, IEEEVR 2021 Oral Presentation, 2021 https://www.youtube.com/watch?v=qc0f9pFiS2s
8. Uncertainty Sets for Image Classifiers using Conformal Prediction, BAIR Retreat, 2021
9. Private Prediction Sets, John Duchi Group Meeting (Stanford), 2021
10. Distribution-Free Risk-Controlling Prediction Sets, Deborah Marks Lab (Harvard Medical School), 2021
11. Distribution-Free Risk-Controlling Prediction Sets, Stanford Partnership in AI-Assisted Care (Stanford Medical School with Fei-Fei Li), 2021
12. Distribution-Free Risk-Controlling Prediction Sets, Stanford Information Theory Forum, 2021, https://www.youtube.com/watch?v=ITJAR3fcNuI
13. Distribution-Free Risk-Controlling Prediction Sets, USC ECE Department Seminar, 2021
14. Distribution-Free Risk-Controlling Prediction Sets, Sharon Li group (UW Madison), 2021
15. Distribution-Free Risk-Controlling Prediction Sets, Weissman group (Stanford), 2021
16. Uncertainty Sets for Image Classifiers using Conformal Prediction, RISE Poster Session, 2021
17. Uncertainty Sets for Image Classifiers using Conformal Prediction, CS329S: Model Evaluation, 2021
18. Distribution-Free Risk-Controlling Prediction Sets, Darrell group (Berkeley), 2021
19. Distribution-Free Risk-Controlling Prediction Sets, SMILELab (Northeastern), 2021
20. Distribution-Free Risk-Controlling Prediction Sets, Perona group meeting (Caltech), 2021
21. Distribution-Free Risk-Controlling Prediction Sets, Candes group meeting (Stanford), 2021
22. Uncertainty Sets for Image Classifiers using Conformal Prediction, RISE Retreat, 2020
23. Uncertainty Sets for Image Classifiers using Conformal Prediction, Berkeley AI Seminar, 2020, https://www.youtube.com/watch?v=jW-mbsVgcIc
24. Dark Data and COVID-19, Occidental College 'The Matrix' Speaker Series, 2020, https://www.youtube.com/watch?t=171
25. Augmented Reality Low Vision Aid, Berkeley AI Seminar, 2019
26. Event-Based Near-Eye Gaze Tracking Beyond 10KHz, Annual Stanford Center for Image Systems Engineering Industry Affiliates Meeting, 2019
27. Augmented Reality Low Vision Aid, USC Institute for Biomedical Therapeutics, 2018
28. Augmented Reality Low Vision Aid, Facebook/Stanford SystemX Alliance, 2018