**KRISH KABRA**

[krish@kabra.com](mailto:krish@kabra.com) | [linkedin.com/in/krish-kabra](https://www.linkedin.com/in/krish-kabra) | [github.com/krishk97](https://www.github.com/krishk97) | <https://krishk97.github.io/>

**RESEARCH FOCUS**

My primary research mission is to develop responsible computer vision systems. I investigate novel methods to evaluate black-box vision models, with an emphasis on conducting causal analyses of learned feature representations and model outputs.

**EDUCATION**

**Doctor of Philosophy, Electrical and Computer Engineering** Expected June 2026

*Rice University*

* GPA**:** 4.00/4.00
* Advisor: Prof. Guha Balakrishnan

**Master of Science, Electrical and Computer Engineering** June 2021

*University of California, Los Angeles*

* GPA**:** 4.00/4.00
* Advisor: Prof. Achuta Kadambi
* Thesis: Diverse R-PPG: Contactless Smartphone Camera-based Heart Rate Estimation for Diverse Skin Tones and Scenes

**Bachelor of Science, Physics** June 2019

*University of California, Los Angeles*

* GPA**:** 3.78/4.00, Cum Laude

**RESEARCH EXPERIENCE**

**Graduate Student Researcher** August 2021 – Present

*Department of Electrical & Computer Engineering, Rice University*

* Advisor:Prof. Guha Balakrishnan
* Researching methods to better understand and evaluate deep learning-based computer vision systems.
* Utilized state-of-the-art image generation models to synthetically create facial image counterfactual pairs for causal analysis of perceptual evaluation metrics.
* Developed an automatic framework that combines large language models and vision-language models to reveal visual biases in datasets and image generation models.

**AI/ML Research Intern** May 2024 – August 2024

*Adobe (Location: San Jose)*

* Mentors: Zhoutong Zhang, Yuting Yang

**Graduate Student Researcher** April 2020 – June 2021

*Department of Electrical & Computer Engineering, University of California, Los Angeles*

* Advisor:Prof. Achuta Kadambi
* Constructed and compiled the world’s first telemedicine-focused remote vital signs dataset, named VITAL, containing a large and diverse subject population in collaboration with UCLA Health
* Developed camera-based vital sign monitoring technology with focus on mitigating skin-tone performance bias, resulting in 22% enhancement of heart rate estimates for dark skin-tone subjects in the VITAL dataset
* Led weekly group meetings, journal club and coffee social hours, which included mentoring fellow research students, and creating a positive and productive social work environment

**Undergraduate/Graduate Student Researcher** May 2017 – March 2020

*Department of Physics & Astronomy, University of California, Los Angeles*

* Advisor:Professor Pietro Musumeci
* Investigated laser shaping tools, such as spatial light modulators, for ultrafast electron photoinjector beamlines
* Conceptualized and conducted the world’s first electron ghost imaging experiment, which utilized a computational imaging and compressive sensing framework
* Gained technical expertise with operating with ultrafast lasers, building table-top optics, and simulating experimental designs with MATLAB, Mathematica, and Zemax

**SKILLS**

Programming languages: Experienced: Python (NumPy, Matplotlib, Pandas, Scikit-Learn, OpenCV, PyTorch, PyTorch Lightning, Transformers, Diffusers, OpenAI API, Tensorflow, Keras), MATLAB | Basic: C++, R

Software: Git, Docker, Linux (Ubuntu), Label Studio

Hardware: Arduino, Raspberry Pi, Oscilloscopes, Soldering, Ultra-fast lasers, Spatial Light Modulators, Optical table-top prototyping

**TEACHING EXPERIENCE**

**Teaching Assistant** Spring 2023, Spring 2024

*COMP/ELEC 447/546: Introduction to Computer Vision (Rice University)*

* Instructor:Prof. Guha Balakrishnan

**D2K Fellow Mentor** Spring 2022, Spring 2023

*COMP 449/549 DSCI 435/535: Applied Machine Learning and Data Science Projects (Rice University)*

* Instructor: Dr. Arko Barman, Dr. Xinjie Lan
* Sponsor organization: Houston Audubon
* Project: Development of Machine Learning Algorithms for Precision Waterbird Monitoring

**Undergraduate Teaching Assistant** Fall 2018, Winter 2019

*Physics 117: Electronics for Physics Measurements (University of California, Los Angeles)*

* Instructor: Dr. Christian Schneider

**PREPRINTS & PUBLICATIONS**

* **K. Kabra,** K. M.Lewis, G. Balakrishnan (2023). GELDA: A generative language annotation framework to reveal visual biases in datasets. *arXiv preprint arXiv: 2311.18064*
* **K. Kabra,** G. Balakrishnan (2023). F?D: On understanding the role of deep feature spaces on face generation evaluation. *arXiv preprint arXiv: 2305.20048*
* **K. Kabra**, A. Xiong, W. Li, M. Luo, W. Lu, R. Garcia, D. Vijay, J. Yu, M. Tang, T. Yu, H. Arnold, A. Vallery, R. Gibbons, A. Barman (2022). Deep object detection for waterbird monitoring using aerial imagery. 2022 21st IEEE International Conference on Machine Learning and Applications (ICMLA). IEEE, 2022.
* P. Chari, **K. Kabra**, D. Karinca, S. Lahiri, D. Srivastava, K. Kulkarni, T. Chen, M. Cannesson, L. Jalilian, A. Kadambi (2020). Diverse R-PPG: Camera-Based Heart Rate Estimation for Diverse Subject Skin-Tones and Scenes. *arXiv preprint arXiv:2010.12769.*
* **K. Kabra**, S. Li, F. Cropp, Thomas J. Lane, P. Musumeci, D. Ratner (2020). Mapping photocathode quantum efficiency with ghost imaging. *Phys. Rev. Accel. Beams, 23(2)*. doi:10.1103/PhysRevAccelBeams.23.022803
* S. Li, F. Cropp, **K. Kabra**, Thomas J. Lane, G. Wetzstein, P. Musumeci, D. Ratner (2018). Electron Ghost Imaging. *Phys. Rev. Lett., 121(11)*. doi:10.1103/PhysRevLett.121.114801

**SERVICE**

**Electrical & Computer Engineering Graduate Student Association (Rice University)** January 2024 – Present

*President*

* Represented the interests of the ECE department graduate students (~100-200), primarily by organizing events, surveying graduate student wellbeing, and communicating with department faculty and staff.

**Upsilon Lab (UCLA)** April 2018 – June 2019

*President & Project Manager*

* Taught undergraduate students digital electronics and microcontrollers through different projects. Led organization by ensuring the steady progress of projects and access to department resources.

**Society of Physics Students (UCLA)** September 2017 – June 2018

*Vice President*

* Coordinated weekly meetings for undergraduates, including professor talks, student panels, social activities, and study halls.