**KRISH KABRA**

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**RESEARCH FOCUS**

My primary research mission is to develop visual machines with exceptional sensing acuity and intelligence, with a specific interest in digital health and medical applications. I investigate topics in computer vision, computational imaging, machine learning, signal processing and artificial intelligence.

**EDUCATION**

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

*University of California, Los Angeles*

* GPA**:** 4.00/4.00
* Advisor: Professor Achuta Kadambi

**Bachelor of Science, Physics** September 2015 - June 2019

*University of California, Los Angeles*

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

**RESEARCH EXPERIENCE**

**Graduate Student Researcher** April 2020 – Present

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

* Advisor:Professor 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

**TEACHING EXPERIENCE**

**Undergraduate Teaching Assistant** September 2018 – March 2019

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

* Instructor:Dr. Christian Schneider
* Assisted teaching students’ theoretical concepts and practical laboratory skills for analog circuits and digital electronics
* Organized and maintained electronics laboratory by testing, fixing and purchasing parts and equipment

**PUBLICATIONS**

* 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. (In submission)*
* **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

**COURSE & PERSONAL PROJECTS**

* SloGAN: Character Level Adversarial Lyric Generation
* Generative Adversarial Networks for Enhanced EEG-Based Motor Imagery Classification
* Penley: Smart Pen for Handwritten Digit Recognition using Pen Motion (2nd place, IDEA Hacks 2020)
* Quadcopter Drone with PID Stabilization
* Spicely: An Automated Spice & Seasoning Dispenser (Top 9, IDEA Hacks 2018)

**SERVICE & MENTORING**

**Upsilon Lab** 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** September 2017 – June 2018

*Vice President*

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

**SKILLS**

Programming: MATLAB, Python (NumPy, SciPy, Matplotlib, Pandas, OpenCV, Tensorflow, Keras, PyTorch), C++, LaTeX

Software: Mathematica, LabVIEW, Zemax, Inkscape, Microsoft Office: Word, PowerPoint, Excel

Electronics:Arduino, Raspberry Pi, Analog & Digital Electronics, Oscilloscopes, Soldering

Optics: Ultra-fast lasers, Spatial Light Modulators (Texas Instruments DLP DMD, Thorlabs Exulus SLM), Cameras, Table-top prototyping