

# K. DORUK KARINCA

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## EDUCATION

### University of California, Los Angeles (UCLA)

*M.S. in Computer Science*

3.92/4.0 GPA, Jun 2021

*B.S. in Computer Science and Engineering*

3.5/4.0 GPA, Aug 2019

**Courses:** Computer Vision, NLP in Gender Bias, Statistical Bioinformatics, [Machine] Learnability Theory, Search Algorithms, Statistics, Discrete Math, Data Mining, Probabilistic Databases, Reinforcement Learning

**Honors:** Dean's Honors

## RESEARCH EXPERIENCE

### UCLA Visual Machines Group

Los Angeles, CA

*Graduate Student Rotation Researcher*

Apr 2020 – Present

- Detect heart rate from webcam videos of faces for telemedicine use.
- Develop generative synthetic dataset augmentation to improve said heart rate detector in a deep learning setting.
- Develop provisional-patented model to help reduce in-person doctor visits during the pandemic.

### Howard Hughes Medical Institute, Ozcan Research Group

Los Angeles, CA

*Undergraduate Researcher and Developer*

Dec 2015 – Mar 2019

- Contributed to 4 academic papers, 11 conference proceedings and 4 oral presentations overall.
- Used **MATLAB**-based **machine learning** image analysis using Boosted Tree & **neural network**.
- Raised sickle cell anemia detection accuracy from portable microscope images from 75% to 92%.
- Reduced diagnosis costs in Sub-Saharan African countries having >150,000 deaths/year.
- Received *Best Project Award at Ozcan Research Group* showcase.

## WORK EXPERIENCE

### UCLA

Los Angeles, CA

*Teaching Assistant*

Mar 2020 – Mar 2021

- Taught Intro to Computer Science in C++ to undergrads spanning control flow, simple algorithms, and pointers.
- Taught Software Engineering in Java to undergrads spanning UML, design patterns, and course project guidance.

### LendingClub

San Francisco, CA

*Software Engineering Intern*

Jun 2019 – Aug 2019

- Implemented full-stack click tracker using **React**, **Node**, **SQL**, **Spring Boot** to collect users' loan preferences.
- Captured 800+ clicks/week on partner loans using this tracker, gathering key business insights on user behavior.
- Revised UI state management for loan offers page to preserve user's progress even after a browser refresh.

### Veritas

Santa Clara, CA and Mountain View, CA

*Software Engineering Intern*

Jun 2018 – Sep 2018 and Jun 2017 – Sep 2017

- Developed authentication client & server compatible with Veritas products using **REST**, **RSA crypt**, and **PL/SQL**.
- Developed full-stack desktop app using **Spring Boot** and **JavaFX** to auto-renew users' expiring Veritas licenses.
- Wrote **Java NLP** app for eliminating manual data entry, providing service to 86% of Fortune 500 firms.
- Organized events as a lead intern and wrote articles on Veritas' on-campus life with interns.

## PERSONAL PROJECTS

### keras-buoy (Github: [github.com/dorukkarcinca/keras-buoy](https://github.com/dorukkarcinca/keras-buoy))

Sep 2018

- Built Keras wrapper that automatically recovers from a crashed/accidentally-cancelled **ML** training process.
- Made pip package in **Python** to help aspiring data scientists train **ML** models for longer periods easily.
- Project downloaded over 2000 times, received 13 stars and 4 forks on Github.

### Uplift (Android app):

Nov 2016 and Apr 2015

- Built backend of social network application based on location-based content ranking using **Node.js**.
- Won Top 10 Prize at LA Hacks, UCLA's hackathon, among 200 teams.
- Won Facebook Award: Best Product among 10 teams, as decided by a jury of Facebook engineers.

## TECHNICAL SKILLS

- **Proficient:** Python (Pytorch), Java (Spring Boot), MATLAB.
- **Basic:** TensorFlow (Keras), PL/SQL, Bash.

## PUBLICATIONS AND PRESENTATIONS

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- Preprints
  - Y. Ba, Z. Wang, D. Karınca, O. D. Bozkurt, A. Kadambi, "Overcoming Difficulty in Obtaining Dark-skinned Subjects for Remote-PPG by Synthetic Augmentation," [arXiv:2106.06007](https://arxiv.org/abs/2106.06007) (June 10, 2021)
  - P. Chari, K. Kabra, D. Karınca, S. Lahiri, D. Srivastava, K. Kulkarni, T. Chen, M. Cannesson, L. Jalilian, A. Kadambi, "Diverse R-PPG: Camera-Based Heart Rate Estimation for Diverse Subject Skin-Tones and Scenes," [arXiv:2010.12769](https://arxiv.org/abs/2010.12769) (December 9, 2020)
- Peer-reviewed articles
  - F. Ghaderinezhad, H.C. Koydemir, D. Tseng, D. Karınca, K. Liang, A. Ozcan, and S. Tasoglu, "Sensing of electrolytes in urine using a miniaturized paper-based device," Scientific Reports [DOI: 10.1038/s41598-020-70456-6](https://doi.org/10.1038/s41598-020-70456-6) (August 12, 2020)
  - K. de Haan, H.C. Koydemir, Y. Rivenson, D. Tseng, E. Van Dyne, L.S. Bakic, D. Karınca, K. Liang, M. Ilango, E. Gumustekin, and A. Ozcan, "Automated screening of sickle cells using a smartphone-based microscope and deep learning," npj Digital Medicine [DOI: 10.1038/s41746-020-0282-y](https://doi.org/10.1038/s41746-020-0282-y) (May 22, 2020)
  - H.C. Koydemir, S. Rajpal, E. Gumustekin, D. Karınca, K. Liang, Z. Gorocs, D. Tseng, and A. Ozcan, "Smartphone-based turbidity reader," Scientific Reports [DOI: 10.1038/s41598-019-56474-z](https://doi.org/10.1038/s41598-019-56474-z) (December 27, 2019)
  - Snow, Jonathan W., Hatice Ceylan Koydemir, Doruk Kerim Karınca, Kyle Liangus, Derek Tseng, and Aydogan Ozcan. "Rapid imaging, detection, and quantification of *Nosema ceranae* spores in honey bees using mobile phone-based fluorescence microscopy." Lab on a Chip, January 28, 2019, <https://pubs.rsc.org/en/content/articlelanding/2019/lc/c8lc01342j>
- Conference proceedings
  - K. De Haan, H. Ceylan Koydemir, Y. Rivenson, D. Tseng, E. Van Dyne, L. Bakic, D. Karınca, K. Liang, M. Ilango, E. Gumustekin, A. Ozcan, "Screening of sickle cell disease using a smartphone-based microscope and deep-learning," SPIE Photonics West, Optics and Biophotonics in Low-Resource Settings VII, March 6-11, Virtual Conference, Paper # 11632-9
  - K. de Haan, H.C. Koydemir, Y. Rivenson, D. Tseng, E. Van Dyne, L. Bakic, D. Karınca, K. Liang, M. Ilango, E. Gumustekin, A. Ozcan, "Sickle cell disease screening from thin blood smears using a smartphone-based microscope and deep learning," SPIE Optics and Photonics Conference, August 24-28, 2020, Virtual Conference, Paper # 11469-54
  - K. de Haan, H. Ceylan Koydemir, Y. Rivenson, D. Tseng, E. Van Dyne, L. Bakic, D. Karınca, K. Liang, M. Ilango, E. Gumustekin, A. Ozcan, "Automated Screening of Sickle Cells Using a Smartphone-Based Microscope and Deep Learning," OSA Conference on Lasers and Electrooptics (CLEO), May 11-15, 2020, Virtual Conference
  - H. Ceylan Koydemir, S. Rajpal, E. Gumustekin, D. Karınca, K. Liang, Z. Gorocs, D. Tseng, A. Ozcan, "Turbidity analysis using a smartphone-based reader", SPIE Photonics West, Optics and Biophotonics in Low Resource Settings VI, February 1-6, 2020, San Francisco, CA, USA
  - J. Snow, H. Ceylan Koydemir, D. Tseng, D. Karınca, K. Liang, and A. Ozcan, "Rapid and automated detection of *Nosema* infection in honey bees using a mobile microscope," BMES (Biomedical Engineering Society) Annual Meeting, October 16-19, 2019, Philadelphia, Pennsylvania, USA
  - H. Ceylan Koydemir, S. Rajpal, E. Gumustekin, D. Karınca, K. Liang, Z. Gorocs, D. Tseng, and A. Ozcan, "Water quality analysis using a smartphone-based turbidity reader," BMES (Biomedical Engineering Society) Annual Meeting, October 16-19, 2019, Philadelphia, Pennsylvania, USA
  - H. Ceylan Koydemir, S. Rajpal, E. Gumustekin, D. Karınca, K. Liang, Z. Gorocs, D. Tseng, and A. Ozcan, "Field portable smartphone based reader for turbidity analysis," 20th Annual UC Systemwide Bioengineering Symposium, June 27-29, 2019, University of California, Merced, CA, USA
  - J. Snow, H. Ceylan Koydemir, D. Tseng, D. Karınca, K. Liang, and A. Ozcan, "Detection of *Nosema ceranae* in honey bees using a mobile microscope," 20th Annual UC Systemwide Bioengineering Symposium, June 27-29, 2019, University of California, Merced, CA, USA
  - K. Liang, J.W. Snow, H.C. Koydemir, D.K. Karınca, D. Tseng, and A. Ozcan, "Honey Bee Parasite Detection Using a Smartphone," The Emerging Researchers National (ERN) Conference in Science, Technology, Engineering and Mathematics (STEM), Organized by AAAS and NSF, February 21-23, 2019, Washington DC, USA
  - H. Ceylan Koydemir, J. Snow, D. Karınca, K. Liang, D. Tseng, and A. Ozcan, "Bee parasite detection using a smartphone", SPIE Photonics West 2019, Optics and Biophotonics in Low Resource Settings V, February 2-7, 2019, San Francisco, CA, USA
  - S. Rajpal, H. Koydemir, Z. Gorocs, D. Karınca, A. Ozcan, "Turbidity measurement using a smartphone," BMES (Biomedical Engineering Society) Annual Meeting, October 17-20, 2018, Atlanta, Georgia, USA
  - H. Ceylan Koydemir, E. Van Dyne, D. Tseng, S. Feng, D. Karınca, K. Liang, R. Nadkarni, R. Varma, and A. Ozcan, "Sickle cell detection using a smartphone based transmission microscope", 17th Annual UC Systemwide Bioengineering Symposium, June 13-15, 2016, University of California, San Francisco, CA, USA
- Oral presentations
  - D. Karınca, K. Liang, J. Snow, H. Ceylan Koydemir, D. Tseng, A. Ozcan, "Bee parasite detection using a smartphone based microscope", May 22, 2018, Undergraduate Research Week, UCLA

- o D. Karınca, K. Liang, J. Snow, H. Ceylan Koydemir, D. Tseng, A. Ozcan, "Bee parasite detection using a smartphone based microscope", May 14, 2018, HHMI Day, UCLA
- o D. Karınca, K. Liang, R. Nadkarni, R. Varma, H. Ceylan Koydemir, E. Van Dyne, D. Tseng, S.W. Feng, A. Ozcan, "Automated detection and classification of sickle cells from whole blood using a smartphone based transmission microscope and machine learning", May 24, 2017, Undergraduate Research Week, UCLA
- o D. Karınca, K. Liang, H. Ceylan Koydemir, D. Tseng, S. W.Feng, A. Ozcan, "A smartphone based microscope to detect sickle cell disease", May 24, 2017, HHMI Day, UCLA