K. DORUK KARINCA

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EDUCATION

University of California, Los Angeles (UCLA)
M.S. in Computer Science 3.85/4.0 GPA, Expected Jun 2021
B.S. in Computer Science and Engineering *3.5/4.0 GPA,* Aug 2019
Courses: Computer Vision, Statistical ML, Gender Bias in NLP, Statistical Bioinformatics, [Machine] Learnability Theory, Search Algorithms, Networks, Statistics, Discrete Math
Honors: Dean's Honors

RESEARCH EXPERIENCE

UCLA, Computer Science, StarAI Lab Los Angeles, CA
Undergraduate Researcher and Developer April 2019 – Jun 2019
- Utilized Probabilistic Sentential Decision Diagram Framework (which represents joint probability distributions over binary variables as circuits) to extract features from gene sequences.

UCLA, Electrical and Computer Engineering, Ozcan Research Group Los Angeles, CA
Howard Hughes Medical Institute (HHMI), *Undergraduate Researcher and Developer* Dec 2015 – March 2019
- Sickle cell detection using a smartphone
  - Developed **MATLAB**-based **machine learning** image-analysis software (RUSBoost ML algorithm), detecting sickle cell anemia from portable microscope images, raising detection accuracy from 75% to 90%.
  - Built software to reduce sickle cell disease screening costs in Sub-Saharan African countries that have >150,000 deaths/year.
  - Received *Best Project Award at HHMI Ozcan Research Group* showcase.
- Water turbidity detection using a smartphone
  - Helped to develop a **Python** script for data postprocessing to detect ocean water turbidity.
  - Developed Windows Phone app with job control that allows a user to take photos of images, sends them to a MATLAB server and displays the turbidity detected from the image.
- Coliform detection using an xy-translational stage
  - Built low-cost **Raspberry Pi** system with two stepper motors that move an attached platform on an xy plane.
  - Wrote Python script that "scans" the entire platform and takes photos at predetermined intervals to expedite the analysis of a large batch of test tubes and to eliminate the need of biology experiment supervision.
- Portable phosphorus detector using a smartphone
  - Wrote MATLAB script that compares treated blood samples for phosphorus presence by measuring their average brightness from a photo and gives information on phosphorus content based on a calibration curve.
  - Developed Windows Phone app to upload photos for server-side analysis of results on MATLAB.

PUBLICATIONS AND PRESENTATIONS

- Peer-reviewed articles
  - H.C. Koydemir, S. Rajpal, E. Gumustekin, D. Karinca, K. Liang, Z. Gorocs, D. Tseng, and A. Ozcan, "Smartphone-based turbidity reader," Scientific Reports DOI: 10.1038/s41598-019- 56474-z (2019)
  - Snow, Jonathan W., Hatice Ceylan Koydemir, Doruk Kerim Karinca, 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
  - S. Rajpal, H. Ceylan Koydemir, D. Karinca, Z. Gorocs, A. Ozcan, "Water turbidity detection using a smartphone" (in preparation)
  - D. Karinca, K. Liang, A. Ray, A. Ozcan, "Proof-of-concept blood diagnostics using mobile devices" (in preparation)
- Conference proceedings
  - H. Ceylan Koydemir, S. Rajpal, E. Gumustekin, D. Karinca, 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. Karinca, 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. Karinca, 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. Karinca, 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. Karinca, 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. Karinca, 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
  - J. Snow, Columbia Univ., H. Ceylan Koydemir, D. Tseng, D. Karinca, K. Liang, A. Ozcan, “Bee parasite detection using a smartphone”, SPIE Photonics West Conference, February 2, 2019, The Moscone Center, San Francisco, CA, USA
  - S. Rajpal, H. Koydemir, Z. Gorocs, D. Karinca, 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. Karinca, 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. Karinca, 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
  - D. Karinca, 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
  - D. Karinca, 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
  - D. Karinca, 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

WORK EXPERIENCE

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 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**, **PL/SQL**.
- Developed full-stack app using **Spring Boot** and **JavaFX** to auto-renew users’ expiring Veritas licenses.
- Wrote **Java** app to analyze PDF invoices heuristically using Tesseract and LingPipe **NLP,** extracting payment date, tax amount etc. saving time by eliminating manual data entry, servicing to 86% of Fortune 500 firms**.**
- Improved navigation experience for **Angular**-based web app for customers like Intel, T-Mobile, and BofA.
- Organized events as a lead intern and wrote articles on Veritas’ on-campus life with interns.

Guitarist and composer Sep 2011 – Present

- Released solo EP on Spotify: https://open.spotify.com/artist/1Wxt1wEoNTDiR5cvQbXD2Y

PROJECTS

Featuretools (Github: github.com/FeatureLabs/featuretools) Aug 2019

- Contributed to **Python** open-source project that automates the machine learning feature engineering process.
- Added support for classifying features that contain US states and regions; wrote unit tests.

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.

History Slides (web application: historyslides.com): May 2014 – Sep 2018

- Implemented slideshow capability, using native **JavaScript,** for a map-based app for interactive history teaching to fill the gap of visualization of history in traditional Turkish education system.
- Built interactive world map in which major WWI events are chronologically highlighted on historical boundaries.

TECHNICAL SKILLS

- **Proficient:** Python (Numpy), Java (Spring Boot, JavaFX), Node.js, MATLAB, React Native, C, C++, Bash.
- **Basic Knowledge:** TensorFlow, Oracle PL/SQL, C#, Verilog