Arjun Earthperson

The B. John Garrick Institute for the Risk Sciences
University of California Los Angeles
Engineering VI - Room 550
Los Angeles, CA 90095

+1 (619) 962-2755
http://arjun372.com
arjun@engineering.ucla.edu
GitHub: arjun372, *LinkedIn:* arjun372

EDUCATION

North Carolina State University *In Progress*
Ph.D. Nuclear Engineering

University of California Los Angeles *Fall 2017*
B.S. Electrical Engineering

EMPLOYMENT

The B. John Garrick Institute for the Risk Sciences, UCLA *May 2018 - July 2020*
Software Development Engineer, Full-Time

- Development lead for all in-house and on-contract software deliverables at the research institute.
- Responsibilities included collaborating with researchers to brainstorm research opportunities, specify design requirements, negotiate constraints and implement scalable, production-ready solutions.
- Trained and managed over 20 developers to deliver 4 web-based software tools over a period of 2 years.

Center for SMART Health, UCLA *June 2016 - Dec 2017*
Student Researcher, Part-Time

- Lead a team of 6 to develop a remote health monitoring system currently servicing 1000+ patients.
- Tasks included embedded development, database design, and API integration for web and mobile applications.
- Implementation of machine learning algorithms (TensorFlow) tackling time-series health-care datasets.
- Design and implementation of a cloud-based fleet management platform using AWS for 1000+ devices.

COURSEWORK

Risk Assessment for Engineers, Program Management for Engineers, Digital Signal Processing, FPGA Design, Algorithm Design, Operating Systems, Feedback Control, Automata Theory

SKILLS

Programming: C/C++, Java, Typescript, React, MATLAB, Verilog, Python, UNIX Shell, LaTeX
Frameworks: NodeJS, Django, Docker, Kubernetes, TensorFlow, Android, SpringBoot, OpenCV, Weka, Xilinx
Hardware: EAGLE, NgSpice, Arduino, PCB Design & Etching, SMT soldering rework

PROJECTS

Human Activity Recognition on Smartwatch: Real-time detection using supervised learning on wrist-worn MEMS inertial motion sensor data. Distinguishes between *walking*, *running*, *lying down*, *sitting*, *standing* or *inactive*. 256 extracted features include energy & entropy in time & frequency domains. Classification using deep neural networks performs at $\geq 85\%$ accuracy in real-world scenarios. Currently being used by 300+ patients in an LA rehab facility.

Indoor Location Fingerprinting Using Ambient Wi-Fi: Models multimodal WiFi RSSI as Gaussian Processes and performs Bayesian Estimation for probabilistic location classification. Time-segmented feature extraction on highly sparse datasets. Written for Android with near-real-time feedback and online supervised learning. $\geq 70\%$ accurate within 3 seconds, $\geq 90\%$ accurate with 10 seconds.

Convex Polygon Detector: Real-time polygon detection for low-powered ARM DSPs. The multistage pipeline includes IIR Deriche filter, progressive blurring kernel, gradient detection, non-maximal suppression, hysteresis thresholding and Hough Transform. Final step computes polygon edge count, orientation and side-lengths.

Analog Utility Meter Reader: Power consumption detection in real-time from analog dials in LA power meters using snapshots from mounted USB cameras. OpenCV implementation pipeline includes noise suppression, SIFT, circular Hough Transform & needle angle detection.

PUBLICATIONS

Rabiei, E.; Huang, L.; Chien, H.; **Arjun**; Diaconeasa, M.; Woo, J.; Iyer, S.; White, M; Mosleh, A. *"Electronic COTS Parts Reliability Estimation in Space Application: The Expert System"*, Part O: Journal of Risk and Reliability (Submitted Jan 2020).

R. Malavalli, **Arjun**, N. Gupta, *"Indoor Localization Through Machine Learning on WiFi Fingerprints"*, International Conference on Indoor Positioning and Navigation (IPIN'17).

Arjun, *"DSP optimization techniques for LCDK with focus on IoT applications"*, Undergraduate Capstone Design Project, DOI: 10.13140/RG.2.2.20822.40008, June 2017

Bouchard K., Ramezani R., **Arjun**, Naeim A., *"Evaluation of Bluetooth Beacons Behavior"*, The 7th IEEE Annual Ubiquitous Computing, Electronics and Mobile Communication Conference (UEMCON'16), pp.1-3, IEEE, 2016.

B. Moatamed, **Arjun**, F. Shahmohammadi, R. Ramezani, A. Naeim, M. Sarrafzadeh, *"Low-cost indoor health monitoring system"*, Wearable and Implantable Body Sensor Networks Conference (BSN 2016), pp.159-164, IEEE, 2016.

PATENTS

PCT/US2016/037398: *"Subject assessment using localization, activity recognition and a smart questionnaire"*, A.Naeim, R. Ramezani, **Arjun**, B. Moatamed, M. Sarrafzadeh

US Provisional Application (62/330,730) filed May 2, 2016: *"Indoor Health Monitoring System"*, A.Naeim, R. Ramezani, **Arjun**, B. Moatamed, M. Sarrafzadeh