

# Arjun Earthperson

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EDUCATION	<b>North Carolina State University</b> <i>Ph.D. Nuclear Engineering</i>	<i>In Progress</i>
	<b>University of California Los Angeles</b> <i>B.S. Electrical Engineering</i>	<i>Fall 2017</i>
EMPLOYMENT	<b>The B. John Garrick Institute for the Risk Sciences, UCLA</b> <i>Software Development Engineer, Full-Time</i>	<i>May 2018 - July 2020</i>
	<ul style="list-style-type: none"><li>• Development lead for all in-house and on-contract software deliverables at the research institute.</li><li>• Responsibilities included collaborating with researchers to brainstorm research opportunities, specify design requirements, negotiate constraints and implement scalable, production-ready solutions.</li><li>• Trained and managed over 20 developers to deliver 4 web-based software tools over a period of 2 years.</li></ul>	
	<b>Center for SMART Health, UCLA</b> <i>Student Researcher, Part-Time</i>	<i>June 2016 - Dec 2017</i>
	<ul style="list-style-type: none"><li>• Lead a team of 6 to develop a remote health monitoring system currently servicing 1000+ patients.</li><li>• Tasks included embedded development, database design, and API integration for web and mobile applications.</li><li>• Implementation of machine learning algorithms (TensorFlow) tackling time-series health-care datasets.</li><li>• Design and implementation of a cloud-based fleet management platform using AWS for 1000+ devices.</li></ul>	
COURSEWORK	Risk Assessment for Engineers, Program Management for Engineers, Digital Signal Processing, FPGA Design, Algorithm Design, Operating Systems, Feedback Control, Automata Theory	
SKILLS	<i>Programming:</i> C/C++, Java, Typescript, React, MATLAB, Verilog, Python, UNIX Shell, L <sup>A</sup> T <sub>E</sub> X <i>Frameworks:</i> NodeJS, Django, Docker, Kubernetes, TensorFlow, Android, SpringBoot, OpenCV, Weka, Xilinx <i>Hardware:</i> EAGLE, NgSpice, Arduino, PCB Design & Etching, SMT soldering rework	
PROJECTS	<b>Human Activity Recognition on Smartwatch:</b> Real-time detection using supervised learning on wrist-worn MEMS inertial motion sensor data. Distinguishes between <i>walking, running, lying down, sitting, standing</i> or <i>inactive</i> . 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.  <b>Indoor Location Fingerprinting Using Ambient Wi-Fi:</b> 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.  <b>Convex Polygon Detector:</b> 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.  <b>Analog Utility Meter Reader:</b> 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.; <b>Arjun</b> ; Diaconeasa, M.; Woo, J.; Iyer, S.; White, M; Mosleh, A. “ <i>Electronic COTS Parts Reliability Estimation in Space Application: The Expert System</i> ”, Part O: Journal of Risk and Reliability (Submitted Jan 2020).  R. Malavalli, <b>Arjun</b> , N. Gupta, “ <i>Indoor Localization Through Machine Learning on WiFi Fingerprints</i> ”, International Conference on Indoor Positioning and Navigation (IPIN’17).  <b>Arjun</b> , “ <i>DSP optimization techniques for LCDK with focus on IoT applications</i> ”, Undergraduate Capstone Design Project, DOI: 10.13140/RG.2.2.20822.40008, June 2017  Bouchard K., Ramezani R., <b>Arjun</b> , Naeim A., “ <i>Evaluation of Bluetooth Beacons Behavior</i> ”, The 7th IEEE Annual Ubiquitous Computing, Electronics and Mobile Communication Conference (UEMCON’16), pp.1-3, IEEE, 2016.  B. Moatamed, <b>Arjun</b> , F. Shahmohammadi, R. Ramezani, A. Naeim, M. Sarrafzadeh, “ <i>Low-cost indoor health monitoring system</i> ”, Wearable and Implantable Body Sensor Networks Conference (BSN 2016), pp.159-164, IEEE, 2016.	
PATENTS	PCT/US2016/037398: “ <i>Subject assessment using localization, activity recognition and a smart questionnaire</i> ”, A.Naeim, R. Ramezani, <b>Arjun</b> , B. Moatamed, M. Sarrafzadeh  US Provisional Application (62/330,730) filed May 2, 2016: “ <i>Indoor Health Monitoring System</i> ”, A.Naeim, R. Ramezani, <b>Arjun</b> , B. Moatamed, M. Sarrafzadeh	