

Daniel Fernández

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Strengths

Automotive	By-Wire Control, CAN Communications, OBD-II, Electrical System Design, Routing, Functional Safety, ISO 26262, Udacity Self-Driving Cars Nanodegree
Software	ROS, Apollo, Autoware, Python, C++, MATLAB, Qt, OpenCV, TensorFlow, Keras, Bash, Git, CARLA, Solidworks, ANSYS AQWA, WAMIT, Atlassian Suite
Academic	Model Predictive Control, Convolutional Neural Networks, LeNet Architecture, Kalman Filtering, Computer Vision, Lane Marker Detection, Sensor Fusion, Path Planning w/ Uncertainty, Marine Field Robotics, Wave Energy Conversion
Leadership	Product Strategy, Storyboarding, Sprint Planning, Ideation, Issue Tracking, Team Culture, Agile, Recruiting, Professional Development, Mentoring, Lean/6-Sigma Production
Industrial	Tool Design, Technical Writing, Ordnance Handling, Process Planning, Silver Solder, Oxy Braze, TIG Welding, CNC Machining, Molybdenum Laser Welding
Field Work	R/V <i>Elakha</i> (11 Cruises), <i>Oceanus</i> (2), <i>Coral Sea</i> (1), <i>Atlantic Explorer</i> (1)

Professional Experience

Navi Robotics Portland, OR

Founder and AV Consultant, ADAS // Autonomous Vehicles Apr 2019 – Present

Founder of a new mobility consulting firm focussed on autonomous and electrified vehicles, software development, and automotive functional safety. Selected Roles (anonymized):

- **Head of Product**, AV Startup: consulted as a Head of Product for a young AV startup; Designed v1 of product suite through industry research and user story workshops. Product emphasizes modularity and seeks to solve customer problems remote monitoring, assisting, and driving a connected, autonomous fleet vehicle.

Jaguar Land Rover Portland, OR

Interim Engineering Manager, ADAS // Autonomous Vehicles Apr 2019 – Present

Senior Software Engineer, ADAS // Autonomous Vehicles Jan 2018 – Present

Engineering lead for North America AV team liaising with greater ADAS Engineering team in UK, Ireland, Hungary, and China to develop and integrate L3+ KPI and features. Driverless systems have inferred a major strategic shift for the electrical engineering organizations within major automakers; this role includes strategic alignment duties emphasizing finding and holding true north in an ever-changing industry to realize tomorrow's connected car. Selected Contributions:

- Architected, designed, and implemented a translation API for communicating mobile device messages to vehicle telematics and near-field sensing modules.
- Engineered HMI and UI/UX user tests by actuating test vehicles via CAN/LIN to mimic L3+ ADAS features under development including: remote control drive/park, learned maneuvers, and highway transfer of control.
- Automated bash infrastructure to reduce Qt prototype development time.
- Collaborated with Intel/Mobileye highway perception and fusion teams by developing software to convert raw ROS bag data to front-facing videos with bounded detected objects.
- Managed ADAS engineering sprint planning and issue tracking emphasizing collaboration through rapid and concise JIRA/GitLab communication with minimal meeting times.
- Earned Self-Driving Cars Nanodegree through Udacity with focuses on: lane detection using openCV, behavioral cloning with CNN's, sensor fusion with EKF's, and PID/MPC control
- Created a seminar series for coworkers to develop technical presentation skills, created a weekly reading group for team members to stay in touch with the driverless industry, wrote a Udacity-based training curriculum, and defined team culture in an inclusive, evolving document.

- Participated in local recruiting events to expand Portland talent deck including organizing meetups with the PDX Women in Tech, Technology Association of Oregon, and Forth Mobility. Liaised with a university driverless SAE racing team to expand student pipeline.
- Strict adherent to automotive safety standards; firm detractor of any culture to the contrary.

Member, Oregon DOT Task Force on Autonomous Vehicles

Apr 2018 - Present

Serving for JLR as the sole automotive industry representative per Oregon House Bill 4063 which charges a task force to provide the state legislature with a set of recommendations for autonomous vehicles legislation. Working with industry counselors and lobbyists to ensure legislation will not reduce the cost effectiveness of testing and deploying L3+ capable vehicles. [2018, 2019 reports available.]

PolySync

Portland, OR

Robotics Application Engineer, Open-Source Car Control (OSCC) Team

Jun 2016 – Nov 2017

Developed and productionalized the OSCC DriveKit autonomous vehicle platform, which enables self-driving applications by actuating existing by-wire systems. A generalist engineering role at the intersection of safety-critical testing and fault-tolerant, embedded systems engineering. Selected Contributions:

- Architected the full OSCC DriveKit system on the 2014-2016 Kia Soul, including Arduino-based control modules, non-native brake actuators, wiring harnesses, and all supporting compute hardware. Developed communication between vehicle OBD-II CAN bus and OSCC control modules. Characterized analog signal ranges between by-wire systems and incorporated ranges into OSCC firmware, all using a man-in-the-middle integration approach with native connectors.
 - Led all productionalization efforts: supervised in-house builds, compiled customer-built, by-wire kits with a kaizen emphasis, established supply chain of safety-minded vendors with supporting process documentation.
 - As the resident field roboticist, advised and aided a team of self-driving engineering nanodegree students at Self Racing Cars in a joint effort with Udacity. The team designed a simulator to test an end-to-end Neural Net driving application using training data from the Thunderhill raceway track collected on an OSCC-powered car. Methods applied included a Convolutional Neural Network, Recurrent Neural Network, and a PoseNet approach, yielding a total of 800 meters of uninterrupted autonomous driving.
 - Maintained OSCC repository in GitHub and supported OSCC customers in-field or remotely with application or integration issues. Provided field support and sensor troubleshooting for PS Core.
 - Represented the growing company at trade and auto shows by giving demonstrations of OSCC vehicles, judiciously tailoring the dialogue for technical, non-technical, or government audiences.
 - Practiced a systematic, cross-functional approach to vehicle development from requirements and architecture, through design and implementation, to testing and quality processes.
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Oregon State University

Corvallis, OR

Graduate Research Assistant, Robotic Decision Making Laboratory

Sep 2014 – Sep 2015

Supported marine robotics grants under Dr. Geoffrey Hollinger. Researched methods of supporting marine renewable energy arrays with autonomous robotic vehicles. Aquatic platforms included: SeaBotix vLBV300 ROV, openROV, and Slocum gliders. Selected Contributions:

- Designed a model predictive controller for the laboratory ROV to compensate for water wave forces. Algorithm showed a 74% reduction in RMS position error when compared to traditional feedback control and also resisted noisy sensor observations of observed wave parameters.
- Supported the W. M. Keck Foundation Award, a cross-disciplinary approach to installing bio-acoustic sensors on Slocum Gliders. RDML focus applied path-planning optimization methods to maximize information gain in tracking macrofauna off the Oregon Coast.
- Built a workflow optimizer for a local industrial partner using robotic decision-making techniques. Genetic algorithm yielded a 61% increase in efficiency for the investment casting area.
- Served as openROV team leader, investigated potential for ultra-low-cost robotic platforms.

Assistant Glider Tech, CEOAS Glider Research Group, R/V Elakha

Jul 2014 – Jun 2015

Supported deployment and retrieval of SeaGlider and Slocum 200m/350m ocean-going gliders for Oregon State College of Earth Ocean, and Atmospheric Sciences. Operations include ballast trimming, battery and hardware replacements, operational S/W updates, off-site piloting, and on-site handling via OSU support vessel, R/V *Elakha* (Newport, OR).

Engineering Technician, O.H. Hinsdale Wave Research Laboratory

Summer 2014

Served as engineering liaison for visiting scientists in the tsunami wave basin and long wave flume. Assisted in beach construction, instrument layout, and wavemaker assembly, among other tasks.

Lockheed Martin Missiles and Fire Control

CA/AL/FL

Systems Engineer, Santa Barbara Focalplane, Santa Barbara, CA

Feb 2013 – Mar 2014, 2016

Supported SBF External Defense and Joint Strike Fighter Customers in a mechanical and software engineering role. Worked on both development and manufacturing projects and provided solutions for tooling, automation, rework, and technical documentation issues. Selected Contributions:

- Led all productionalization efforts for the MS-177 Project, a high orbit, angled detector assembly with uniquely specific design considerations.
- Designed C++/Qt4 applets as production aids including: epoxy weight/volume convertors, cure time recorders, reminders, and precision measurement calculators for design-driven assembly.
- Justified use of automated “rapid” pump down vacuum baking stations on the JSF dewar assembly, where the large air volume draw was a concern. Along with joint stress analysis, designed resulting procedure, an automated process which aims to realize \$1,800,000 in savings over the contract life.
- Provided mistake-proofing procedures in response to a failed tooling audit. Standardized SBF tool ordering process and updated 15 year old tool records accordingly.

Production Support Engineer, Pike County Operations, Troy, AL

Jun 2010 – May 2012

Supported MFC Troy’s Javelin and AGMS programs; responsible for designing and updating visual-based manufacturing and test procedures. Addressed defects qualitatively and implemented mistake-proofing strategies where possible. Interacted with government customer daily.

Student Technical Specialist, Ocala Operations, Ocala, FL

Summers 2009, 2007

Summer Internships as a manufacturing engineer supporting production and tooling of AGMS and Javelin circuit-card assemblies, sensor groups, and guidance assemblies.

Doma Ventures, LLC

Miami, FL

Development Engineer, South Miami Office

June 2012 – Sep 2013

Supported a startup ecommerce firm as a technical lead. Analyzed product lines for potential failures and gave engineering approval for all product launches. Used CADD skills in a product design role and worked with offshore-based manufacturing facilities to ensure quality. Provided web development support across multiple platforms.

Education

Oregon State University — Corvallis, OR

Relevant Coursework

M.S. Robotics Engineering, September 2015

Minor in Coastal/Ocean Engineering

Cumulative GPA: 3.7/4.0

Robotic Sequential Decision-Making
Linear Controls, Marine Glider Dynamics
Wave/Fluid Mechanics, Coastal Hazards
Coastal Oceanography, ROV Operation

University of Florida — Gainesville, FL

B.S. Mechanical Engineering, May 2010

Cumulative GPA: 3.2/4.0

Heat Transfer, Finite Element Method
Mechanical Vibrations, Solar Utilization
Computer Aided Draft and Design

Research Grants Supported

Department of Energy: Autonomous Support for Marine Renewable Energy Arrays (\$233,427)

W.M. Keck Foundation: Bioacoustic Sensors and Path Planning on Webb Slocum Gliders (\$128,786)

Office of Naval Research: Adaptive Decision Making, Autonomous Exploration/Exploitation (\$510,000)

PCC Structural, Inc: Investment Casting Work Schedule Optimization (\$110,000)

Publications and Reports

1. **D. Fernández**, G. A. Hollinger, "Model Predictive Control for Underwater Robots in Ocean Waves" In: *IEEE Robotics & Automation Letters*, 2.1:88–95, 2017.
 2. **D. Fernández**, G. A. Hollinger, "Model Predictive Control for Underwater Robots in Ocean Waves" In: *Proceedings of the IEEE International Conference of Robotics and Automation (ICRA)*, 2016
 3. **D. Fernández**, G. A. Hollinger, "Summary of Autonomous Underwater Path Planning Techniques and Applications", *Department of Energy Internal Circulation*, 2015
 4. B. McCay, **D. Fernández**, L. Premuda, "Automated Vacuum Bake Procedure for the JSF Dewar Assembly", *Department of Defense Internal Circulation*, 2013
 5. **D. Fernández**, R. Himoto, A. Soto, "Vacuum-Induced Stress Analysis for the JSF Coldfilter/Coldshield Joint Structure", *Lockheed Martin Missiles and Fire Control Internal Circulation*, 2013
 6. **D. Fernández**, "A Gage Repeatability and Reproducibility Analysis for the Javelin Forward Environmental Seal", *Lockheed Martin Missiles and Fire Control Internal Circulation*, 2011
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Organizations and Certifications

Forth Mobility	Member: 2018 - present
University of Michigan MCity TechLab	Member: 2016 - 2018
Institute of Electrical and Electronics Engineers	Member: 2015 – present
IEEE Robotics and Automation Society	Member: 2015 – present
American Society of Mechanical Engineers	Member: 2011 – present
Oregon State University Robotics Club	Member: 2014 – 2016
National Northwest Marine Renewable Energy Center	Member: 2013 – 2016
Engineers Without Borders	Member: 2007 – 2013
Society of Automotive Engineers	Member: 2007 – 2012
R/V Elakha Sea Safety & Survival Certified	April 2015
First-Aid, and SCUBA Certified, C.P.R. Trained	Various Dates
Languages: English and Spanish fluency, French basic	

Conferences, Trade Shows, and Awards

Forth Mobility: "Cutting-Edge Transportation Technologies: Autonomous Vehicles", Presenter, 2018
Automated Vehicles Symposium, Attendee, 2017
Self Racing Cars, Participant (joint with Udacity), 2017
North American International Auto Show, Exhibitor, 2017
AutoMobility LA Top Ten Automotive Startups, Winner, 2016
Los Angeles Auto Show, Exhibitor, 2016
Automated Vehicles Symposium, Exhibitor, 2016
IEEE International Conference on Robotics and Automation, Presenter, 2016
NNMREC Annual Assembly, Presenter, 2015
IEEE International Conference on Robotics and Automation, Attendee, 2015
ACM/IEEE International Conference on Human-Robot Interaction, Attendee, 2015
OWET Ocean Renewable Energy Conference, Attendee, 2014
Santa Barbara Focalplane Performance Management Team of Year, Dewar Test and Integration, 2013
Malcolm Baldrige National Quality Award Recipient, 2012
Pike County Operations Spot Recognition Award, January 2012
Pike County Operations Employee of the Month, November 2011
Pike County Operations Performance Management Team of the Year, Javelin, 2011
Florida Bright Futures Scholarship Recipient, 2005 – 2010
College Board AP Scholar with Distinction Award, June 2005

References

Alexander Voets	eMobility Product Manager, Daimler Trucks North America (fmr ADAS Eng. Manager, JLR) cell: 971.201.6411; email: voets.alexander@gmail.com
Manuela Papadopol	CEO, DesignatedDriver cell: 425.647.3640; email: papadopol@designateddriver.ai
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Thai Hai Pham	HMI Manager, Jaguar Land Rover cell: 503.501.6673; email: thpcgr@hotmail.com
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