

Christopher X. Miller

San Diego, CA
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Experience

TuSimple; San Diego, CA

Product Manager I – Virtual Driver Products

Jan 2022 – Present

- Designing the patent-pending capability for authorities to interact with pulled-over vehicles in partnership with state and local law enforcement agencies
- Designing a method for the autonomous vehicle to interact with weigh stations in partnership with state law enforcement, external partners, and federal regulators

Product Manager I – OEM Hardware

Feb 2021 – Jan 2022

- Designed and launched the vehicle's first prototype sensor-cleaning system capable of cleaning most of the vehicle's sensor suite to expand the vehicle's operational domain
- Designed and launched the company's first prototype emergency vehicle siren detector used to both detect and locate an emergency vehicle in 3D space
- Defined TuSimple's 4-year production roadmap for hardware, virtual driver, and oversight products with OEM partner Navistar and coordinated executive approvals between both TuSimple and Navistar
- Authored and secured leadership approval for the TuSimple and Navistar production program product requirements for sensor cleaning, toll booth interactions, cabin monitoring, vehicle access management, vehicle law enforcement interactions, cellular/GPS communications, truck yard communications, headlights, weigh station communication, hand held device communication, vehicle fueling and related communication, and cabin control
- Assessed, interpreted, and implemented US federal (i.e., FMVSS) and state regulatory compliance across all hardware products; translated regulations to requirements in collaboration with both engineers and in-house regulatory teams
- Generated over 50 KPIs to guide the development of the company's second-generation, pre-production self-driving trucks by conducting trucking industry research, interviewing developers, and driving executive approvals

Motivo; Los Angeles, CA

Associate Product Manager

May 2020 – Feb 2021

- Saved Motivo \$XX by identifying timeline inefficiencies, facilitating engineers' communications, and reallocating company-wide resources across automotive, ag-tech, sporting, and robotics projects
- Increased company revenue by XX% through the launch and small-scale manufacture of a new Ag-tech product for use in crop harvesting by leading a five-person team of engineers and technicians and partner
- Decreased weekly burn rate by XX% for a team of seven engineers and technicians across several robotics projects totaling XXM by optimizing people placement, detailing KPIs, and following Agile methodology
- Developed eight new client engagements with Fortune 500 and private company executives by researching company financials, analyzing business operations, and synthesizing opportunity reports for Motivo's executive leadership

Robotics: Assistive and Rehabilitation (argallab), Northwestern Univ; Chicago, IL

Research Assistant

Jul 2017 – Aug 2020

- Designed, managed, and executed a 16-person, IRB-approved study to classify human-robot (wheelchair) control inputs
- Modeled when to autonomously shift between assistance modes by classifying human control commands using RNNs, anomaly detection, and classical methods (KERAS/TensorFlow/scikit-learn); published results in IEEE-IROS 2021
- Developed software to measure the quality of human control commands (ROS/Python/C++) for a smart wheelchair
- Co-designed and -managed a 20-person, IRB-approved study to classify the control difficulty for a 6-DOF robotic arm (Kinova MICO) and developed control-sharing modes software (ROS/Python) using an in-house potential fields library

National Robotics Engineering Center (NREC), Carnegie Mellon Univ; Pittsburgh, PA

Electrical Engineer II

Jun 2016 – Jul 2017

- Led the electrical design for a Wheel-to-Track Transformer Robot as part of the DARPA Ground Vehicle X Program
- Designed wheel-track's rugged, noise-immune electronic control and monitoring system through mixed-signal circuit design and PCB fabrication in Altium; assembled benchtop electrical prototype; assisted with full system integration
- Designed for Anglo American Copper, a mining pipeline profiler robot's high-level electrical system, motherboard, motor controller interfaces, power supplies and cable harnesses in Altium Designer and supported systems integration/testing

- Served as the lead electrical engineer and electrical system project manager on US DoD/DARPA- and industry-sponsored robotics projects through high-level system design in Visio, personnel task allocation, and milestone tracking
- Communicated updates with executive sponsor leadership via monthly presentations and quarterly reports

NASA's Jet Propulsion Laboratory/Caltech; Pasadena, CA

Summer Undergraduate Research Fellow

May 2014 – Aug 2014

- Miniaturized the BioSleeve V3, a surface EMG gesture recognition system, from the size of a small desktop computer to that of an index card by developing C++ and MATLAB drivers for existing computer systems

Education

Master of Science in Mechanical Engineering (Robotics/Machine Learning) – Northwestern University Sep 2017 – Jun 2020

Bachelor of Science in Electrical Engineering – The Pennsylvania State University Aug 2012 – May 2016

Major Awards

National Defense Science and Engineering Graduate Fellowship – U.S. Dept. of Defense (\$124K + tuition) Apr 2019

Graduate Research Fellowship – The National Science Foundation (\$138k) Apr 2019

Technical Skills

Languages Python, ROS, MATLAB, C++

Tools JAMA, Jira, Visio, MS Project, Altium Designer, TensorFlow, KERAS, scikit-learn, pandas, SolidWorks

Hardware PCB design, Arduino, SPI, I2C, UART, CAN, motion controllers, LIDAR, encoders, microcontrollers (TI, STM, & Microchip), EEG/EMG biosensing systems

Other Agile, technical writing, IRB review, human trial design, battery characterization/modeling, cable harness design, Kalman filters, particle filters, rugged system design, robotic potential fields, robot arm control

Selected Publications

An Analysis of Human-Robot Information Streams to Inform Dynamic Autonomy Allocation, **1st Author**, IEEE/IROS 2021

Formalized Task Characterization for Human-Robot Autonomy Allocation, **2nd Author**, IEEE/ICRA, 2019

State of Charge Estimation for an Electric Wheelchair using a Fuel Gauge Model, **1st Author**, DSCC 2016