Christopher X. Miller

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Experience

ShieldAI; *San Diego, CA*

Product Manager – Hivemind Edge — June 2022 – Present

- Product manager for the AI pilot, a set of SaaS software packages that enable both Shield AI's solutions team and defense companies to develop their own autonomy software to control military vehicles ranging from drones and fighter jets to ground vehicles and sea vessels known as Hivemind Enterprise (HME)

TuSimple; *San Diego, CA*

Product Manager I – Virtual Driver Products — Jan 2022 – May 2022

- 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, Azure DevOps, Jira, AirTable, Project, SQL, Altium Designer, TensorFlow, KERAS, scikit-learn, pandas
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

Emergency siren detection in autonomous vehicles, USPTO, 2023, US20230065647A1
Systems and methods for granting access to autonomous vehicles, USPTO, 2023, US20230398959A1
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