DANIEL S. COHEN

4450 Apt 8 Bassett St, Santa Clara, CA 95054 ▪ (602) 471 -6435 ▪ https://danscohen.com
▪ https:gitbub.com/cohend2012 ▪ https://www.researchgate.net/profile/Daniel-Cohen-12 ▪
https://www.linkedin.com/in/daniel-cohen-robotics-software/ *▪cohend2012@gmail.com*

EDUCATION

ARIZONA STATE UNIVERSITY • TEMPE, ARIZONA
Master of Science, Robotics and Autonomous Systems, School of Aerospace and Mechanical Engineering

- GPA: 4.0
- Thesis Publication: Sagittal Plane Dynamic Modeling and Control of Aerial Manipulator for Phytobiopsy, Committee: Ph.D. Jnaneshwar Das, Ph.D. Hamidreza Marvi, Ph.D. David Saldaña
- Classes: Advanced Modern Control and Estimation, Advanced System Modeling Dynamics and Control, Robotic Modeling and Controls, Autonomous Exploration Systems with ROS, Python for Rapid Engineering Solutions with Machine Learning, Bio-Inspired Robotics, Linear Algebra

EMBRY-RIDDLE AERONAUTICAL UNIVERSITY • PRESCOTT, ARIZONA
Bachelor of Science, Mechanical Engineering (*magna cum laude*)

- Emphasis in Robotics
- The Outstanding Graduate in Mechanical Engineering (Faculty Vote)
- GPA: 3.7
- Dean's List

WORK EXPERIENCE

MKS INSTRUMENTS • MILPITAS, CALIFORNIA
Sr. Automation Engineer June 2022-Current

- Spearhead the strategic vision for robotics manufacturing engineering, emphasizing automation, to maximize, reliability, yield, up-time, while minimizing cost and cycle time, in collaboration with other engineering teams, facilities, health & safety, quality. ($1B division)
- Led all robotics software automation efforts as an individual contributor and day-to-day team operations manager.
- Acted as subject matter expert on implementing novel robotic assembly and manufacturing for optical/laser systems at the multi-site/global level.
- Founding Member of MKS Global Automation Counsel and Software Working Group, SME Robotics, ML, AI, responsible for Automation Strategy, Prioritization, and Vendor Relationships,
- Managing the selection process and purchase of robotic manipulators and all equipment, ~1M budget, 200k to date utilized.
- Minimizing lead times for all BOM down to ~6 weeks and cost, suppliers' discounts 10%-25% on average.
- Established and cultivated an industry-leading robotics automation group, fostering a culture of innovation, excellence and trust.

- Led architect for agnostic behavior-based robotics middleware operating system using MQTT to serve as foundation for in-house robotics assemble and alignment of optical and laser system.
- Wrote Python high-level process step manager and lower-level multi-threaded multi-queue processor to manipulator waypoints.
- Created a unified robot manipulator driver to quickly switch and manage multiple software drivers, and manipulators operating in the automation workflow, ex, flexible between ROS 1 and TCP/IP Socket for Fanuc or Mecademic.
- Established Basic CI/CD pipeline, Azure DevOps, Agile methodologies, System V and HIL.
- Established C++, Python 3, C#, and Structured Text codebase for Beckhoff Automation Industrial PC (TwinCAT) to command, communicate, and to provide close loop control, and robotic manipulators, via Ethernet and EtherCAT
- Developed novel laser alignment procedure for closed-loop power and alignment feedback without micron-level tool center point accuracy/calibration. Micron level performance, millimeter measurements.
- Led camera selection, integration, and programming to assist closed-loop laser alignment.
- Mentoring and hired, two Jr. Engineers.
- Led Lean Six-Sigma Team for Kaizen Event for ASML Sector Heater (50 laser units assembled into 1 System), under Yellow Belt Mgmt. 3-month event led to 25% output capacity increase.

Robotics and Controls Systems Graduate Engineer June 2021-August 2021 and November 2021-June 2022

- Developed preliminary robotics and control automation assembly plan for Class 4 lasers, Talon, IceFyre, and Millennia based on 3,700 pages of alignment assembly procedures
- Lead Python 3 coding development for simulating robotic assembly and aliment process with RoboDK with GUI (All code peer-reviewed)
- Presented potential costs, benefits, and robotic simulation to all executives and directors
- Developed a relationship with KUKA to provide a clean room robot at no cost to test the application
- Defied PLC integration with Beckhoff Automation for Python, C++ and C#.
- Hired Graduate Automation Interns with final selection.

NEFF POWER-ROBOTICS AND AUTOMATION • PHOENIX, ARIZONA
Applications Engineer August 2017-January 2021

- Lead Developer for industrial automation solutions for business clients in Arizona, New Mexico, Nevada, California
- Served as Subject Matter Expert for Yaskawa Robotics and Servos, Denso, Sick LiDAR Sensors, and Turck Sensors, along with communication protocol integration.
- Responsible for managing all technical aspects of client pre and post-sale support
- Provided robotics training for all customers and potential clients.
- Created monthly internal application-focused lecture training series to increase subject matter knowledge on automation, and advance DISC® profile sales proficiency.
- Anchored technical solutions for Cognex, Amazon, WL-Gore, National Institute for Aviation Research, Microchip, Intel
- Satellite office Sales Growth from $0-2M per-year in 3 years.

SETTON PISTACHIO OF TERRA BELLA • TERRA BELLA, CALIFORNIA
Robotics and Controls Engineer January-August 2017

- Co-Founder, Lead Architect for Robotics R&D/Automation Lab

- Developer, autonomous systems, mechanical, software, and electrical for Pistachios culling and final packaging
- Developed C++ software for I/O and TCP/IP communication between 3-DOF Robot and Hyperspectral Convolution Neural Network on Industrial PC
- Wrote MATLAB software to test path planning algorithms for 3-DOF Robot
- Verifying and identifying forward and inverse kinematics for 3-DOF H-Bot Macron Dynamics
- Lead development of Costco/Kirkland 3lb and Trader Joes 1lb pistachio packaging lines
- Wrote and integrated Python UR-5 pick and place robotics software for packaging lines.
- Developed a novel robotics gripper to vacuum gripper for pistachios bags
- Maintained legacy automation projects, equipment, and documentation

ROCKWELL COLLINS AEROSPACE (An RTX Company) • CEDAR RAPIDS, IOWA

Platform System Avionics Engineering Co-op (Legacy Tankers KC-135/KC-10) August 2016-December 2016

- Developed MATLAB scripts for system-level requirements testing for KC-135 Avionics
- Assisted in the development and review of use cases on KC-135 Servo Auto-throttle using Java/MATLAB
- Prototyped new KC-135 Rudder Position Indicator for USAF using MATLAB
- Performed platform system testing on Block 40.6 KC-135 Avionics Collins Flight2 System
- Led and participle in Python code reviews for system-level requirements for KC-135 and KC-10 (DOORs Based Requirements from USAF)
- Developed down selection presentation for the French Air force Emergency Locator Transmitter and presented findings resulting in purchases and integration contract for Rockwell Collins

MICROCHIP TECH. INC. • CHANDLER, ARIZONA

Wireless Solution Validation Engineering Co-op (Wireless Solution Group) April 2016-August 2016

- Spearheaded new plotting standards in Python and templets for prototype PIC 32MKs
- Developed PIC 32MK PCBs for electrical validation and verification using Altium Designer
- Performed validation of prototype 32-bit microcontrollers with Bluetooth
- Managed all lab equipment and calibrated group equipment from Atmel acquisition

Applications Engineering Intern (Analog, Interface, Product Division) April 2015-August 2015

- Developed procedure for finding closed-loop fan controller PID gains and sampling times for SunMicro Systems
- Created AC power meter load tester for Microchip Masters Convention
- Designed and built CAN/LIN temperature sensor demonstration for Microchip Masters Convention
- Updated documentation of parts and products, analog-to-digital converters, and operational amplifiers
- Performed quality control for Analog, Interface, and Product Division Developer Kits

EMBRY-RIDDLE AERONAUTICAL UNIVERSITY • PRESCOTT, ARIZONA

Teaching Assistant, Robotics I-II, Tangent Bug, RRT, ATM, Potential Fields, Forward and Inverse Kinematics 6-DOF, LiDAR, 2015-2016
Academic Tutor (Probability & Statistics; Robotics I, Robotics II), 2014-2016

TECHNICAL SKILLS

Engineering Software:

- *Advanced:* Python 3,2.7(Along with various libraries), MATLAB, SIMULINK, DOORS, CATIA v.5, LATEX
- *Intermediate*: C++, C, Linux, ROS1, Gazebo,TensorFlow,GIT, Atmel Studio 6.1, ANSYS(Mechanical APDL 16.0)
- *Basic*: ROS2, Java, SPSS, LabVIEW, MPLAB
- *Office Software:* Microsoft Word, Excel, PowerPoint

- *Robot Controls/Manipulators:* Fanuc, Yaskawa Robots and Servos, DENSO Robotics, Universal Robotics, Mecademic
- *Microcontrollers:* Atmel (Atmega 128), PIC 8/16/32
- *Microprocessors: Beaglebone Black, Raspberry Pi*
- *PLC/Motion: BECKHOFF, Yaskawa*
- *Industrial Safety: Sick Safety with Lidar*

PUBLICATIONS

Topline Results: 5 Publications, 1 Book Chapter, ASME Magazine Article and CES Demo

Robotics:

- Cohen, Daniel S. ***Sagittal Plane Dynamic Modeling and Control of Aerial Manipulator for Phytobiopsy***. ProQuest Dissertations Publishing, 2022.

- Mualeedharan, N., Cohen,D & Isenberg, D.R. (2016). "***Omnidirectional Locomotion Control of a Pendulum Driven Spherical Robot***". IEEE SECON Conference Proceedings, 2016

- Mualeedharan, N., & Cohen, D. (2020). "***Modeling and Simulation of UAV Systems.***" Estrella, V.,
  Hemanth, J., Saotome, O., Nikolakopoulos, G., Sabatini, R., (2020). *Imaging and Sensing for Unmanned Aircraft Systems - Volume 1: Control and Performance*. London, UK: The Institution of Engineering and Technology, May 31, 2020.

AI/ML Medical:

- Sayrs L.W., Nickoles, T., Pickett, A., Ghandi, G., Lakkam, S.N., Shah, M., Kalidindi,P., Tripathi, V., Kistamsetty, S., Yerrapothu, C.G., Reigel, J., Cohen, D. & Muraleedharan, N. "***An Evidence-based Machine Learning Algorithm to Optimize Pediatric Trauma***." Poster presented at the First Global Symposium of Innovation in Trauma Research Methods, Nationwide Children's Hospital, Columbus, OH, June 12, 2018.

- Sayrs L.W., Nickoles, T., Pickett, A., Ghandi, G., Lakkam, S.N., Shah, M., Kalidindi,P., Tripathi, V., Kistamsetty, S., Yerrapothu, C.G., Reigel, J., Cohen, D. & Muraleedharan, N. "***Reducing Over-triage in Level 1 Pediatric Trauma Activation via Data-mining Techniques***." Poster presented at 2018 PCH Research Day, Phoenix Children's Hospital, Phoenix, AZ, May 4, 2018.

Startup Consulting

Topline Results: Business and technical advice leading to funding exceeding $2.5 M.

TRC Robotics Multipurpose Modular Mobile Robot • Milpitas, CA

Robotics Software Consulting reporting to CTO (Stockholder), *May 2023-Current*

- Preparing MVP-2 for second round of fundraising
- Dev/Ops, Kubernetes K8, Docker, Distributed Mobile Robotics Simulation, Oracle Cloud
- Wrote standards guide on how to use official Docker Containers
- Wrote standards guide on reverse SSH for Cyber-Physical System remote development.
- Mentored new ROS1 software engineering on best practices and how to contribute effectively to the prod. codebase.

Aptus LLC AI/ Machine Learning, Software Development (now AI Venture Studio) • Scottsdale, Arizona

Business and Engineering Adviser, August 2017-June 2019

- Sourced First Angel Investor (MD Neurosurgeon and CS undergrad with previous exits) for Medical AI Start Up,
- Outlined original algorithm to assist Aptus in transitioning to new Machine Learning software development efforts.
- Assisted with Dynamic Modeling and Control Architecture of Cleo Robotics-Dronut for CES, (As of 2022 they have $2.5M from U.S. Army)
- Product manager and Dynamics Subject Matter Expert for general-purpose robotics modeling and simulation software, along with working on business models -Dynamix
- Advised and assisted in hiring software engineers for Aptus LLC

Phoenix Spine Surgery Center • Phoenix, Arizona

Machine Learning/AI Software Team Supervisor and Developer, April 2015-August 2015

- Assistant in architecture and developed Python and SPSS-based machine learning tools using multi-channel data.
- Hired, supervised, and mentored a 2-person team of software developers.

PROJECT EXPERIENCE

ASU Distributed Robotics Exploration and Mapping Systems Laboratory, August 2021-Current Sagittal Plane Dynamic Modeling and Control of Aerial Manipulator for Phytobiopsy

- Under the direction of Dr. Jnaneshwar "JD" Das and using the NSF funded cyber-physical test bed OpenUAV to research and write my thesis on *Sagittal Plane Dynamic Modeling and Control of Aerial Manipulator for Phytobiopsy*
- Mentoring other Master's thesis based on publication using MPC-model predictive control using Python in ROS-1
- OpenUAV Cyber Physical systems 2020 Mapping and Data Muling Challenge using Q-Ground Control, PX4 offboard control, ROS, MAVROS, and RTABmap

- PX4 Flight Stack and OpenUAV ROS1 Investigation into pushing compliant and non-compliant objects

ASU Neuromuscular Control and Human Robotics Laboratory, December 2020-May 2021 Machine Learning for Gait Phase Predictions for Weight and Speed Robustness

- Developed Novel AI/ML solutions (Feed-Forward, LSTM, and Convolution Neural Networks) to determine the validity of predicting gait phase time series regression.
- Recorded baseline human kinematic data using split treadmill and Vicon Motion Capture system along with force plate data.
- Moved the project to Phase 2 research to narrow down new input variables and developing a new testing protocol for the next human trial to train networks on variable speed walking data.

ASU Bio-Inspired Robotics, Technology and Healthcare Lab, January 2021-May 2021 Bio-Inspired Hybrid Suction Gripper with Novel Silicone Printing Manufacturing Techniques

- Researching and Developing Novel Silicon 3D Printer with Conductive filament
- Developing Bio-Inspired Silicone suction cups and grippers

ERAU Senior Capstone Project and IEEE Publication —Spherical Robot for Outdoor Exploration Utilizing a 2-DOF Pendulum, August 2015 to April 2016

Prelim and Detail Design Team Lead of 5 Robotics and Aeronautical Engineers

- Developed MATLAB software for dynamic modeling and verification of controller design
- Designed a novel omnidirectional locomotive control system
- Implemented novel control algorithm using Python 3 on Beaglebone Black using 9-DOF Quaternion-based IMU and GPS.
- Led total system integration of all hardware and software
- Led Printed Circuit Board design
- Led CATIA and FEA modeling and simulation of the robot
- Managed team, project timeline, budget, and software flowcharts
- Sourced potential purchased of the control system software before and after IEEE publication was complete.

Trinity College Fire Fighting Home Robot Contest ▪ Eagle Robotics Club

Mechanical Team Lead of a Four-Person Team, August 2014 to August 2015

- Designed chassis and differential drive train, lead redesign efforts
- Created servo-driven fire extinguishing system utilizing C02
- Developed software for the evaluation torque and angular velocity requirements for purchasing motors

AWARDS AND SCHOLARSHIPS

- Tau Beta Pi, 2022
- Engineering Graduate Fellowship Merit-based Scholarship, 2021
- Outstanding Graduate in Mechanical Engineering Class (Faculty Vote), 2016

- Dean's List, 2012-2016
- ERAU President's Award, Underwater Robotics Sea Turtle Fin Kinematics Simulation, 2013
- ERAU Academic Scholarship, 2012
- ASME FIRST Clarke Engineering Robotics Scholarship, 2012
- Finalist, Rotary International Science and Technology Scholarship, 2012
- FIRST Robotics, Las Vegas Regional Runner Up (2/43), 2012
- FIRST Robotics, Team Professionalism Award, 2012

LEADERSHIP AND COMMUNITY SERVICE

- *Graduate Fulton Ambassador for Robotics and Autonomous Systems Master's Program*▪ Mentor, 2021
- *FIRST Robotics Team 3187* ▪ Industry Mentor, 2016-present
- *ASU Capstone Software Engineering Team* ▪ Industry Mentor, *2019-2020*
- *Fire-Fighting Home Robot Contest*, Mechanical Team Lead, 2014-2015
- *Ignite Grant Sea Turtle Fin Prosthesis*, Design and Kinematic Simulation Lead,2013
- *Eagle Robotics Club*, Vice President, 2014-2015
- *TEDx Task Force*, Curator, 2014-2015
- *Boy Scouts of America*, Eagle Scout, 2008

REFERENCES

Available upon request

Jnaneshwar Das, Ph.D.
Alberto Enrique Behar Research Professor
School of Earth and Space Exploration
Arizona State University
781 Terrace Mall, Tempe, AZ 85287
djnan@asu.edu

Douglas Isenberg, Ph.D.
Associate Professor of Mechanical and Aerospace Engineering
Embry-Riddle Aeronautical University-Prescott 3700 Willow Creek Rd, Prescott, AZ 86301
isenberd@erau.edu

Iacopo Gentilini, Ph.D.
Associate Professor of Mechanical and Aerospace Engineering (2012-2018)
Embry-Riddle Aeronautical University-Prescott
3700 Willow Creek Rd, Prescott, AZ 86301
iacopo@kaliagri.it

Stephen Bruder, Ph.D.
Associate Professor of Electrical Engineering
Embry-Riddle Aeronautical University-Prescott
3700 Willow Creek Rd, Prescott, AZ 86301
bruders@erau.edu