Kiva McCracken

Orlando, Florida, USA kivamccr kivamccr.xyz

Education

B.S. Optics & Photonics, *CREOL, University of Central Florida*
2026 | Orlando, FL

- Constructed laser aligned optoelectronic systems using industry standard optomechanics, gaining industry applicable experience.
- Learned software skills such as MATLAB & Python to improve data processing accuracy. For example: Extracting wavelength from video of Michaelson interferometer translation.
- Taught CAD, rendering, and LaTeX in weekly workshops, filling in critical curriculmn gaps at CREOL.

AP Scholar Grad, *Suncoast Polytechnical Highschool*
2021 | Sarasota, FL
Technical School, engineering program, robotics, CAD, etc...

Precision Machining, *Suncoast Technical College*
2021 | Sarasota, FL

- Completed the Titans of CNC curriculum using Fusion 360 CAD/CAM software to learn operation of the Haas VF-2 CNC mill.
- Performed inspections using calipers, micrometers, & optical comparators to verify that milled parts met the $\pm$0.002" tolerance, gaining a understanding of tolerance callouts & concepts.
- Applied feed & speed principles on manual mills and lathes for various metals, successfully producing parts that met drawing specifications.

Advanced Manufacturing, *Suncoast Technical College*
2020 | Sarasota, FL

- Certified in SolidWorks & trained in FDM/SLA 3D printing, creating complex lattices and functional 3D-printed parts.
- Operated a Trotec laser cutter, using CorelDraw to design & fabricate complex 2D-to-3D slotted parts.
- Fabricated a welded sculpture using a plasma cutter & MIG welder, earning second place at SkillsUSA Sarasota.

Experience & Organizations

Volunteer Engineering Instructor, *Discovery Middle School*
2024 - 2026 | Orlando, FL
Teaching 7th to 8th grade level students general CAD usage and design principles.

Research Assistant, *Dr. Jaesung Lee*
2024 - present | Orlando, FL

- Designed vacuum chambers & custom optomechanics using CAD & 3D printing, enabling fast project lifecycles and decreasing costs.
- Optimized Silicon nitride membrane fabrication protocol using wet etching & direct write lithography, culminating in cleanroom experience & device redesign.
- Created & led an emergency team to recover diamagnetic composite production after a scheduling breakdown during a $1.2M grant deadline, enabling renewal and continued funding.

Photonics Camp Director, *University of Central Florida*
2024 - 2026 | Orlando, FL

- Taught optics & photonics principles to over 100 students using custom hands-on projects, increasing engagement.
- Increased photonics curriculum presence by creating custom PCBs, lowering cost of projects and increasing hands-on component.
- Managed communication via automated systems such as Qualtrix to save time & reduce errors, increasing parent satisfaction.

Contractor, *Roots Engineering Services*
2021 - 2024 | Hybrid

- Designed piping & instrumentation diagrams (P&IDs) to construct electro-pneumatic systems using industry distributors. Creating an educational framework for robotic material handling & processing.
- Created marketing & pre-vis materials for robotic systems using Blender & Davinci Resolve, aiding in the sale of a $1.3M semiconductor manufacturing simulator.
- Automated workflows by programming UR-series cobots, validating educational systems, and supporting curriculum design.

Job Shadow, *NASA*
2024 | Kennedy Space Center

- Toured pad 39B, VAB, and launch control– learning about fuel & safety infrastructure, rocket assembly, and launch criteria.
- Visited the Prototype Development laboratory, and learned about the various manufacturing processes used in iterative deign: mills, 3D printers, waterjets, wire EDM, orbital welding, etc...
- Visited the Cryogenic Test Laboratory, learning about liquid rocket fuel containment, and the challenges of vacuum and temperature control.

Job Shadow, *Consolidated Electrical Distributors*
2024 | Orlando, FL

Learned about commercial & residential electrical equipment, inside/outside sales, manufacturer-distributor relations, and warehouse picking/logistics.

Certified Technician, *Valvoline*
2023 - 2024 | Oviedo, FL

- Increased sales through tactically leveraged discounts, improving revenue (+15% over store goal) & customer satisfaction.
- Performed oil, transmission, & differential services, using strict protocol & documentation to ensure liability coverage.

Drone Pilot, *University of Miami*
2019 | Peru

Drone survey & videography of Rio Chillon for torrent duck and habitat research.

Lifetime Member, *Suncoast Science Center*
2016 - 2021 | Sarasota, FL

- Taught hundreds of volunteers & users advanced manufacturing tools in hands on workshops & classes, standardizing lab training & improving volunteer teams capability.
- Managed sub-team as part of RC Car event senior committee, using roadmaps, breakout groups, & regular check-ins to accomplish all major builds ahead of schedule.
- Accrued 500+ hours of volunteer time, over the course of 5 years through lab projects/improvements, culminating in a Lifetime Membership Award as an alumni.

Skills

3D CAD/CAM ●●●●●

Solidworks, Onshape, & Fusion 360 (+CAM)

Lasercutting ●●●●●

Trotec Speedy M400, MC-1325, Epilog-3536, and various others.

Vector Design ●●●●●

Coreldraw & Inkscape

3D Rendering ●●●●○

Blender & Solidworks Visualize

CNC Mill ●●●●○

Haas VF2 & TM1, +CAM

3D Printing ●●●●○

Strasys F170, Form 2/3, Taz 5, Makerbot Sketch, Bambu X1C, etc... + tolerances

Basic Shop Machinery ●●●●○

Bandsaw, table saw, belt sander, drill press, hand tools, etc...

LaTeX ●●●●○

Documentation, article formatting, formula sheets, etc...

Hand Lathe/Mill ●●●○○

Feed and speed calculation, marking and centering, & general usage.

Notable Certificates

- SolidWorks CSWA Academic
- SolidWorks CSWP Professional
- NIMS CNC Mill Operations
- MATLAB Onramp
- UCF EHS: Lab, Laser, Radiation, & X-ray.

Publications

[1] McCracken, K. G., Alza, L. A., McCracken, K. G., and Smith, M. M. (2012). Parasitism and joint incubation of upland goose (chloephaga picta) nest by yellow-billed pintail (anas georgica). *Ornitología Neotropical*, 23(2):287–290.

Professional Projects

Linear Circuits Formula Sheets 2023 - 2024
Comprehensive formula sheet for Linear Circuits I & II, using LaTeX.

Robotic Surgery Training system 2022 - 2023
Rendering & initial design of mock remote surgery system, for elementary level robotics education.

Semiconductor Manufacturing Training System 2021 - 2023
Rendering, CAD, and design work for a collegiate level robotic training system in simulated semiconductor manufacturing.

Medallion Factory Training System 2021 - 2023
Rendering, CAD, and design work for a collegiate level robotic factory training system.

Tradeshow Marketing Animation 2022
A video compilation of existing ROOTS systems, for a tradeshow/future marketing needs.

Robotic Medical Training System 2022 - 2024
A render for the proposal an elementary/middle school level robotic training system, the premise: robotic surgery.

Logistic Learning Factory 2022 - 2023
A render for the proposal of a collegiate level robotic training system package, that replicated a factory logistic layout of incoming boxes, AMRs, and robotic gantries.

UCF Great Naval Orange Race 2022
A GPS navigation based boat design, and an accompanying publication style research paper for the UCF annual Great Naval Orange Race.

Manatee County Build & Install 2021
The build, and install of a elementary level robotic training system.

SkillsUSA Welded Sculpture 2020
A welded butterfly and flower, made out of plasma cut steel. Won 2nd place in Regionals.

Rio Chillon Torrent Duck Project 2019
Drone Piloting, videoing, and survey of the Chillón River in Peru.

MicroTorr Vacuum Chamber 2024
Custom chamber designed for CNC machining, with support for microscope & electrical feedthroughs.

Automated Lens Parameter System 2025 - 2026
Developing budget high power Xenon source, imaging system, & codebase to generate lens datasheet ex situ.

For a full list of projects check out my website!