Dominic Holifield

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Detail oriented and analytical mechanical engineer with a strong background in robotics, automated inspection and test equipment, and software integration. Proven ability in quality control optimization and competitive robotics, seeking roles that leverage hardware-software integration and problem-solving skills to solve impactful engineering challenges.

EDUCATION

Purdue University | West Lafayette, IN — Aug 2020 - May 2024
Bachelor of Science in Mechanical Engineering, Minor in Computer Science — *GPA: 3.4 / 4.0*

- Relevant Coursework: Controls Systems, FEA, CAD & Prototyping, Statics, Dynamics, Machine Design, Heat and Mass Transfer, Fluids, Thermodynamics, Linear Algebra, Differential Equations, Numerical Methods, Circuit Analysis.

SKILLS

- **CAD & FEA**: Autodesk Inventor, AutoCAD, Creo, SolidWorks, NX, Abaqus, Fusion 360, KiCad, CATIA.
- **Programming**: C++, C, Python, SQL, Mitsubishi PLC, GitHub, Linux, LaTeX, Matlab, LabVIEW, Java, JavaScript.
- **Manufacturing**: 3D Printing, Mill, Lathe, CNC, Casting, MIG Welding, Ultrasonic Testing, Inj. Molding, Stamping.

EXPERIENCE

Subaru of Indiana Automotive, Inc | Lafayette, IN — June 2024 - Present
In-Process Control Assembly Engineer, Tester Line - Quality Control

- Specialize in final vehicle testing, with ownership of light and thermal inspections, wheel alignment, and headlight aim.
- Develop and modify PLC logic and Python automation scripts to enhance production efficiency and support operators.
- Utilize statistical process control to predict headlight aiming equipment drifts and automatically determine precise setting adjustments, replacing the long existing reactive and guess-and-check methods.
- Evaluating precision wheel alignment processes using techniques including six sigma and gauge R&R. Investigating improved alignment methods leading to a 2.2x increase in repeatability and a 11.3% decrease in station takt time.
- Optimized exterior light inspection programs, preventing over-inspection and unnecessary labor hours by 34%.

Subaru of Indiana Automotive, Inc | Lafayette, IN — May 2023 - Aug 2023
Powertrain Manufacturing Engineering Intern

- Led cross-functional teams to design and manufacture custom sensor carts used for rapid testing, and improve assembly line jigs, reducing ergonomic injuries from 5 (2022) to 0 (2023).
- Updated production floor layouts and designed production support parts using AutoCAD and Inventor to modernize documentation and support team workflow.

Purdue Undergraduate Research | West Lafayette, IN — Aug 2020 - May 2021
Undergraduate Researcher - Autonomous Motorsports Purdue

- Worked with a team to develop a waypoint-based approach to autonomous driving and racing.
- Ran simulations in Unity in a vehicle physics environment to create CNN-based waypoint trajectory prediction, and developed control algorithms to navigate the track, leading to a 125% lap progress increase.

EXTRACURRICULARS

VEX & VEXU Robotics Competition | West Lafayette & Zionsville, IN — Aug 2016 - May 2024
Mechanics, Software, and Drive Team (BLRS2, BLRS, and 7701T)

- **2024 VEXU World Champion, 2022 VEXU Skills World Champion, 2020 Kalahari Classic Champion.**
- 6x world championship qualifiers, 3x world division finalists, 12x tournament champions, and 7x skills champions.
- Collaborated with a large group to design, build, and optimize static and dynamic systems for a competition robot through the design process, incorporating extensive CAD, prototyping, and design improvements.
- Constructed robots using various manufacturing processes, including 3D printing and CNC, and off-the-shelf parts.
- Programmed control algorithms to minimize navigation time and error, including PID and a custom Pure Pursuit variant using linear circle approximation, and achieved <2" odometry accuracy over 12ft, despite IMU drift limitations.
- Developed and maintained open-source robot chassis control libraries (appa & ARMS) for ourselves and others to use.
- Utilized many sensors for feedback, including capacitive encoders, IMUs, color sensors, and vision cameras.

Purdue Aerial Robotics Team | West Lafayette, IN — Aug 2023 - May 2024
Guidance, Navigation, and Control

- Spearheaded the development of a payload drop location calculation system using numerical integration in Python.
- Performed Monte Carlo simulation to determine the accuracy of the system based on input measurement variations.
- Successfully tested and adapted a drop location script, contributing to the team's goal of accurate autonomy.

Mechanical Keyboard Design | Personal Project — June 2020 - Present

- Designed, prototyped, and programmed custom mechanical keyboards, including PCB schematics and layouts optimized for minimal component count, and a reversible PCB for both halves of a split keyboard.
- Executed full product development lifecycle from problem definition and iterative prototyping to user testing, feedback integration, and designing for manufacturing scalability.