Dominic Holifield

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Mechanical engineer with a strong background in robotics, manufacturing processes, and software integration. Proven ability in quality control optimization and competitive robotics, seeking roles that leverage mechanical design, mechatronics, and software 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, Matlab, Java, LabVIEW, JavaScript, Mitsubishi PLC, GitHub, Linux, LaTeX.
- **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 - Quality Control

- Specialize in mass-production vehicle testing equipment, including light and thermal inspection, wheel alignment, headlight aim, vision calibration, free-roller testing, and function checker testing.
- Optimized exterior light inspection programs, preventing over-inspection and unnecessary labor hours by 34%.
- Evaluating precision wheel alignment processes to achieve a 20% reduction in warranty-related alignment issues.
- Rotated through all quality control departments, learning about supplier, stamping, body, and assembly quality on top of our testing equipment to ensure the highest quality vehicles for our customers.

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.
- Successfully tested and adapted a basic drop location script, contributing to the team's goal of accurate autonomy.
- Integrated knowledge from coursework, such as Control Systems and Numerical Methods, to optimize GNC systems.

Mechanical Keyboard Design | Personal Project — June 2020 - Present

- Designed, prototyped, and programmed custom mechanical keyboards, including PCB schematic and layout optimized for minimal component count by utilizing a reversible PCB for both halves of a split keyboard.
- Applied end-to-end product development: problem identification, iterative prototyping, user feedback integration, and planning and designing for manufacturing scalability.