Dominic Holifield

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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: Measurement & Controls Systems, Finite Element Analysis, Computer Aided Design & Prototyping, Statics, Dynamics, Machine Design, Mechanics of Materials, Heat and Mass Transfer, Fluids, Thermodynamics, Linear Algebra, Differential Equations, Multivariable Calculus, Numerical Methods, Linear Circuit Analysis, Bowling

SKILLS

- **CAD & FEA**: Autodesk Inventor, AutoCAD, SolidWorks, Creo, NX, Abaqus, Fusion 360, CATIA
- **Programming**: C, C++, Python, Matlab, Java, LabVIEW, JavaScript, CSS, HTML, 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

- Specialized 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 35%.
- Investigating and confirming precision wheel alignment equipment with the goal of reducing poor alignment in warranty.
- 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 to our customers.

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

- Led diverse engineering projects, from assembly line jigs to custom carts, using Inventor, AutoCAD, and SolidWorks.
- Modified an assembly line jig to solve workability issues, reducing station injuries from 5 (2022) to 0 (2023).
- Collaborated with cross-functional teams and gained a comprehensive understanding of manufacturing engineering, from materials to assembly. Adapted seamlessly between office-based tasks and hands-on production activities.
- Completed many projects, including updating powertrain floor layouts and designing various parts to assist production.

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, created a convolutional neural network for waypoint prediction, and developed control algorithms to navigate the track, leading to a 100% lap progress increase.

EXTRACURRICULARS

VEX & VEXU Robotics Competition | West Lafayette & Zionsville, IN — Aug 2016 - May 2024
Mechanics, Software, and Drive Team

- **2024 VEXU World Champion** on team BLRS2, defeating over 100 global university teams.
- **2022 VEXU Skills World Champion** on team BLRS2, defeating over 75 global university teams.
- **2020 Kalahari Classic Tournament Champion** on team 7701T, competing against over 150 teams.
- 6x world championship qualifiers, 3x world division finalists, 12x tournament champions, and 7x skills champions.
- Worked 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.
- Programmed control algorithms including PID, pose tracking algorithms (odometry), and autonomous movement controls to follow paths, points, and poses to increase efficiency and reduce error to outscore the competition.
- Developed and maintained open-source robot chassis control libraries (ARMS & appa) for ourselves and others to use.
- Utilized various sensors including optical shaft encoders for precise rotation measurement, IMUs for reliable heading data, and cameras for AI vision tracking to expand the potential of the robots and gain an advantage.

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, built, and programmed custom mechanical keyboards in the pursuit of an optimized human interface device.
- Learned many aspects of end-to-end product design including research and discovery of the problem, design and prototyping of the solution, user feedback and optimization, and planning for scaling and manufacturability.