Siddharth Gummadapu

732-829-4713 | sg97@illinois.edu | https://www.linkedin.com/in/siddharth-gummadapu/

Education

University of Illinois Urbana-Champaign Urbana, IL

Bachelor of Science in Computer Engineering, Bachelor of Science in Mechanical Engineering *May 2027*

- Coursework: Electronic Circuits, Signal Processing, Digital Systems Laboratory, Computer Systems Engineering, Mechanical Design, Thermodynamics, Statics, Dynamics, Solid Mechanics, Materials, Manufacturing Design, Dynamical Modeling of Systems, Computer Architecture, Data Structures, Deep Learning for Computer Vision

Experience

Hardware Engineering Intern June 2025 – August 2025

BAE Systems *Nashua, NH*

Undergraduate Researcher Aug 2024 – Current

Advanced Controls Research Laboratory *Urbana, IL*

- Running CARLA simulations for a VTOL hybrid drone, supporting controls research for SciTech submission
- Developing ROS2 simulations for occluded-vision scenarios, enabling robust autonomous perception

Leadership

American Society of Mechanical Engineers August 2023 – Current

Director of Product Development *Urbana, IL*

- Leading a 40+ member committee developing engineering solutions for clients across industry and academia
- Overseeing projects including assistive devices, a 3D printing robotic arm, and other client-focused technologies
- Organizing and teaching CFD and FEA workshops to 100+ students, expanding technical training within UIUC

Illini EV Concept Aug 2023 – Current

Drivetrain Team Lead *Urbana, IL*

- Directing a 5-member team, optimizing power delivery systems for an electric car in the Shell Eco-marathon
- Designing a 16:1 gear reduction system to align motor and wheel RPM, focusing on minimizing structural load
- Coordinating with cross-functional teams to select and test motors, achieving 85% average efficiency

Projects

Intelligent Mattress Topper | *Arduino, Python, PCB/Circuit Design, Embedded Systems* Aug 2024 – Present

- Leading a 6-member team designing a smart mattress expected to improve early pressure ulcer detection by 60%
- Building a real-time Python heatmap using Arduino for sensor data, projected to cut monitoring time by 80%
- Engineering scalable embedded PCBs using KiCAD and designing an air-valve repositioning system

Autonomous Drone Docking | *ROS 2, Gazebo, Python, C++, OpenCV, Control Theory* May 2025 – Aug 2025

- Simulated drone docking in Gazebo with ROS 2 and PX4, achieving 92% success rate in randomized test cases
- Implemented vision-based localization using YOLOv8 and AR markers, with 95% detection accuracy at 8m range
- Optimized adaptive PID controller, reducing position error by 35% and control latency by 40%

2 Player Tennis Game | *FPGA, SystemVerilog, MicroBlaze, Vivado, Vitis* Mar 2025 – April 2025

- Created a tennis game using FPGAs and the MicroBlaze microarchitecture as a System-on-Chip (SoC) platform
- Developed SPI drivers in C to interface with the MAX3421E USB host controller for simultaneous keyboard input
- Implemented game physics and collision logic in SystemVerilog and used BRAM to render video output to HDMI
- Troubleshooted hardware implementation using Vivado testbenches and waveform analysis

Quadcopter Frame Development | *FEA, CFD, DFMA, CAD, Ansys/Fluent, SolidWorks* May 2024 – Aug 2024

- Designed and fabricated a quadcopter frame using DFMA principles in SolidWorks and 3D printing
- Reduced arm deformation by 95% through iterative redesign based on static structural FEA in Ansys
- Achieved 2:1 thrust-to-weight ratio by correcting aerodynamic flaws identified in propellers by CFD in Fluent
- Systematically incorporated GD&T principles on all engineering drawings, adhering to ASME Y14.5 standards

Technical Skills

Computer Languages: SystemVerilog, C/C++, Python, Java, JavaScript, HTML/CSS
Mechanical Design: Geometric Dimensioning and Tolerancing (GD&T), Design for Manufacturing and Assembly (DFMA), Finite Element Analysis (FEA), Computer Aided Design (CAD), Computational Fluid Dynamics (CFD)
Platforms: Vivado, SolidWorks, Fusion360, Cura, Ansys/Fluent, MATLAB/Simulink, ROS2, Gazebo, Arduino, KiCAD