Aditya Goturu

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SKILLS AND EXPERIENCE

- **Programming**: C, Python, MATLAB, Java, bash, assembly languages (ARM, x86, AVR), programming and debugging in an embedded context, Linux kernel development, backend web programming.

- **Software**: E-CAD (Fusion 360 Electronics/Eagle, Altium Designer, KiCAD), M-CAD (Solidworks, Fusion 360, Siemens NX, AutoCAD), Electrical Simulation (LTSpice, Keysight ADS, MATLAB Simulink, Cadence Virtuoso), Mechanical Simulation (ANSYS Mechanical, MATLAB Simscape 3D, Siemens NX Simcenter 3D, SimScale, MSC ADAMS), CAM (Autodesk HSM/HSMWorks, MasterCAM)

- **Academics**: Experience with technical literature and writing papers. Experience with LaTeX. 3 semesters of experience as a Teaching Assistant, conducting an electronics lab for a class of 60 students.

- **Networking**: Past experience with systems administration on linux and windows, very proficient with scripting and automation, systems programming and enterprise networking.

- **Lab and Workshop**: Proficient with use of most common electronics test equipment, including oscilloscopes, multimeters, function generators, power supplies and spectrum analysers. Experience with soldering, including SMD and BGA components with hot air, use of power tools. Can operate both manual and CNC Mills (3-Axis) and Lathes. Experience with operating FANUC and Siemens control for CNC. Can operate, maintain and modify 3D printers (FDM and SLA).

EDUCATION

- **Mahindra University (formerly Mahindra École Centrale)** — Hyderabad, India
  B.Tech Electrical and Electronics Engineering; GPA: 7.19 — *Aug. 2018 – June. 2022*
- **Relevant Coursework**: Linear Electronic Circuits, Digital Electronics, Digital Signal Processing, Numerical Methods, Communication Theory, Network Synthesis and Filter Design, Microprocessors, Computer Architecture and Design, Stochastic Differential Equations, Radar Systems and Signal Processing, Nonlinear Dynamics and Chaos, VLSI Design Automation

PROJECTS

- **Analysis of an efficient line-coding scheme alternative to 8b/10b**: Designed testing methodology for a line-coding scheme for use in SerDes interfaces. Developed multiple full-system simulations, including modifying a Keysight ADS model of PCI-Express for use with this custom line-code, statistical simulations/calculations, and modified PyBERT (an open source communication link error simulator) to include this scheme. Patent and publication pending.

- **BGM4Life: Emotion estimation for music prediction**: Developed a hardware unit that collected data from analog and digital sensors (including frequency-response analysis), intended to be a wearable (i.e with battery charging on-board, extremely small form factor). The board had almost negligible power consumption (compared to the sensors themselves), and supported Bluetooth Low-Energy.

- **Electronics board for wearable gas sensor**: Designed a wearable electronics board with similar requirements to the above board, but had additional constraints on mechanical design size and was to be designed for scale production. There was also a requirement for an on-board heater control, and the board had to be designed for signal integrity. This board was developed as part of an internship with Wi-Sense LLC, a startup founded by a Georgia Tech associated professor.

- **Mechanical and Electrical Design for Baja SAE**: Designed and simulated a 4WD powertrain and drivetrain for a Baja SAE vehicle, including full CAD, CAM and machining strategy. In the process, developed a suspension solver in C in order to optimize suspension hardpoints by brute-force under given constraints. Designed a modular data-acquisition system for easily adding sensors to the vehicle using a custom CAN-like bus developed specifically for being bit-banged on low-cost micro controllers. Apart from cost, the micro controller shortage in 2021 was a motivator for this, as we were able to acquire a large stock of some very bare-bones atsamd10 parts.

- **Electric Bike Powertrain Design**: Designed a full powertrain for an electric bike, including regenerative braking. As it was intended for a competition, the design was non-standard, as we tried to maximize the power output given the constraints of the competition's rulebook. The project was abandoned due to the competition itself being cancelled.

- **Drone design for LiDAR applications**: Designed and developed a drone for safely carrying a LiDAR, while powering it and recording the output data.

- **5 Axis 3D printer**: Designed a 3D printer with tiltable nozzle and rotating bed, for improved strength in certain geometries. Project was never funded.

Clubs and Societies

- **Orion Club of MEC**: Founding member of the hobby RC modelling and flying club at MEC. Created a basic inventory of common parts for student use, and managed the only 24x7 access student-lab/makerspace on campus. Club head from February 2019 to August 2021.

- **Gas Monkeys Racing (Baja SAE)**: Started in 2018 as an electronics team member, and helped with brakes on the 2018 car. Continued with brakes and electronics for 2019, while also helping with manufacturing. Headed the club for the 2020-2021 academic year, during which time I designed powertrain, drivetrain, suspension and electronics systems. The design continued to the next year as the car wasn't built due to covid-19. Served as senior team mentor for the 2021-2022 academic year, and was the primary mill/lathe programmer/operator. Machined all key powertrain and drivetrain components.