Gungeet Singh

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Education

University of Illinois at Urbana-Champaign — **Aug 2021 - Dec 2022**
Master of Science in Aerospace Engineering — *Urbana-Champaign, Illinois*

Thapar Institute of Engineering and Technology — **Aug 2014 - July 2018**
Bachelor of Engineering in Mechatronics Engineering — *Patiala, India*

Technical Skills

Skills: CAD | CAM | Applied CFD | FEA | UI/UX | Robotics | Automation | Electro-mechanical Design | Orbital Mechanics | Product Development Lifecycle | Electronics Simulation | Software Development | Embedded System
Tools: SolidWorks | Ansys | MATLAB | Proteus | Arduino | Android Studio | WordPress
Languages: Bootstrap | JAVA | JavaScript | Python | HTML | C/C++ | C# | CSS

Projects

Optimized Mission from Earth to Mars | *MATLAB, Python, Excel, Notepad*

- Formulated a mission to Mars using the **Artemis Gateway** over a live **dataset of 9 years from JPL Horizon System**.
- Implemented a **weighted function** to maximize the Mars exploration time and reduce the fuel consumption by designing a solver based on the principles of **Particle Swarm Optimization method**
- Developed a **caching solution** to handle **3B+ data points** hence increasing the overall **performance by 50%**

Optimal Thrust Control | *MATLAB*

- Built an optimal thrust **bang-bang controller** for a transfer from Low Lunar Orbit to Higher Lunar Orbit
- Used **MEE**(Modified Equinoctial Elements) to create a robust solver and **reduced computing time by 10%**
- Performed a **parametric sweep** over various engines specification to identify the optimal thruster with a travel time of **27 hours**.

Applied CFD | *ANSYS*

- Designed multiple versions of **CD Nozzle** to examine its performance in subsonic and supersonic conditions to identify a design with prominent **diamond shock** wave during transient response.
- Conducted a **steady analysis** on the symmetrical **NACA0012 airfoil** to assess lift-to-drag ratios across various angles of attack.

FEA on Heat Sink | *MATLAB*

- Designed a **heat sink** for the Intel Alder Lake LGA 1700 chip to dissipate a **temperature rise of upto 93°C**
- Analyzed **loading conditions** based on various combination of the **material**(Al & Cu) and **medium fluid** (air & water).
- Performed a **parametric sweep** over the **height** of heat sink to identify the **saturation** point of the heat dissipation in the corresponding sink.

ArmBot | *SolidWorks, Arduino, CAM, Android, 3D-Print, RF Module, Bluetooth, CAD*

- Built **3-way encoded RF wireless**, **gesture** controlled, **mobile** robotic arm with **modular end-effector** to grip and drill.
- Modified Mars rover's **rocker bogie arms**' design to build a Mobile base to maneuver over a rough terrain.
- Developed a **troubleshooting android application** to carry **health check status** of the ArmBot.

QuaBot | *SolidWorks, Arduino, Servo Motor*

- Designed a **chasis of an Amphibian Robot**, incorporating **electro-mechanical** components within a water-resistant enclosure, with additional feature of wheel fins to optimize **aquatic** maneuvering.
- Developed a radar system as a **safety mechanism**, capable of detecting obstacles located in the periphery of QuaBot.
- Performed Proteus simulation to test and validate the integration of relay control with the radar system.

Prosthetic Hand | *SolidWorks, Arduino, 3D-Print, Flex Sensor, Servo Motor, Proteus*

- Designed a **Solidworks** model for a prosthetic hand capable of supporting a **3kg payload**.
- Implemented a grasping motion feature by integrating a **flex sensor** to **detect muscle movement** at the elbow.
- Conducted **simulations** in **Proteus** to validate the functionality of the flex sensor.

Work Experience

Park Circle Technologies LLC **April 2023 - Ongoing**

Web Developer | Full Stack *Short Hills, New Jersey*

- **Designed, developed, and implemented** 31 new webpages for a remodel of the fellowship program website, resulting in improved overall website workflow.
- **Engaged with clients** to gather requirements and create multiple prototypes for the implementation of custom features, such as visual data representation, banner section.
- Developed a **back-end data filter** to extract and retrieve relevant information, enabling the creation of a **dynamic directory** based on user-selected filter options.
- **Enhanced** the **Content Management System** by scripting vanilla **bootstrap** code to design and integrate **UI/UX** components such as hero section, login functionality, edit profile section.
- Devised a **migration** strategy to move webpages from **Drupal 9** to **WordPress 6** and designed various web-templates using Elementor.

Shorthills Tech PVT. LTD. **Oct 2020 - Aug 2021**

Software Engineer I | Leadership Experience *Gurgaon, India*

- Responsible for **design and delivery of 4 projects,** while **leading** a team of 3 individuals -
  - Center for Neurorestoration and Neurotechnology
  - New Hampshire Army National Guard USA
  - Asian American Psychological Association
  - Fort Stewart Hunter Army Airfield
- Assigned tasks and **introduced a test tracking system** to monitor and manage the testing process throughout the **project life cycle**, ensuring **timely project completion** and **effective coordination**.
- Created keyboard **accessible webpages** compatible with screen readers on multiple platforms by utilizing various **testing techniques** to ensure **high-quality deliverables**.
- **Implementation, maintenance and performance testing** of visuals, texts and **accessibility features** such as contrast ratio, dynamic font sizing, keystroke focus, dyslexia friendly websites.

Deloitte USI **Aug 2018 - Nov 2019**

Business Technical Analyst | Quality Assurance *Mumbai, India*

- Developed an intranet news feed **android** application from a s**chematic wire-frame**, following **MVC design methodology** to **automate** sharing of information within **7 cross-functional teams**.
- **Created a new server** to fetch pictures and dynamically update content using **Picasso** library and JSON
- Handled **Client Request changes** ensuring **minimal issues post deployment.**
- **Independently** identified **32 critical bugs** using MAGI (Modified Adjusted Gross Income) methodology thus **fixed** the **complete Document Processing Module** for customer correspondence.
- **Awarded 2 spot awards** for outstanding performance in testing and delivery.

Tata Motors LTD. **Jan 2017 – June 2017**

Research Intern *Dharwad, India*

- Implemented **3 major** and **12 mini projects** as part of **JIDOKA** implementation
- Devised an embedded system to **automate** the **manual transmission** of Trans Axle TA59 as a response to user feedback.
- Built an **Automatic Kitting trolley** to carry the components to the assembly line following the concepts of **LFR**.
- Implemented **image processing** to identify part defect in the manufacturer plate with an **accuracy of 0.1mm**.
- Added quality improvements and **reduced lead time** by a factor of **60 minutes** by adding **Kaizens** on the **assembly line**, led to increase in daily production from **90 to 103**.

Community Involvement

- Customer Service Assistant at Campus Recreational Outdoor – Rock Climbing.
- Deloitte's CSR - Underprivileged Education Program Volunteer.
- Core member of placement training council.
- Discipline team member in SATURNALIA and AAGHAZ 2015 (Cultural Events).

Certificates

Spaceflight Engineer | Star Project - Armbot | SolidWorks: Design for Mechatronics | Arduino: Prototyping | Embedded System and Robotics certification | Programming for Everybody (Getting Started with Python) | Training in SolidWorks