

# Sai Swarup Reddy

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## EDUCATION

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- Purdue University - Master of Science in Mechanical Engineering - West Lafayette, IN** August 2020 – May 2022
- Focus in Human-Computer Interactions and User-Centric Design
  - Cumulative GPA: 3.74/4.00
- Purdue University - Bachelor of Science in Mechanical Engineering - West Lafayette, IN** August 2016 – May 2020
- Cumulative GPA: 3.46/4.00

**Relevant Coursework** – Product and Process Design, Mechatronics, Automatic Control Systems, Microprocessors and Electromechanical Systems, Computer-Aided-Design and Rapid Prototyping, Machine Design, Mechanics of Materials, Fluid Mechanics, Static and Dynamic Mechanics, Thermodynamics, Heat and Mass transfer, German (Level 4)

## TECHNICAL SKILLS

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### Design & Manufacturing Skills

- Creo/ProEngineer
- SolidWorks
- Catia v5
- AutoCAD/Inventor
- NI LabView
- FEA (ANSYS, Altair Inspire)
- GD&T (ASME Y14.5)
- Design for X
- Rapid Prototyping (3D Printing, Laser Cutting)
- Machining (CNC, lathe, drilling)

### Programming Skills

- Unity (VR/AR Development)
- HTML/CSS/JavaScript
- C#/C/C++
- MATLAB/Simulink
- Python
- Arduino
- Assembly Language

## RELEVANT WORK EXPERIENCE

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- Apple Inc. – WSCE OTA/SAR (Robotics Systems) Engineering Intern – Remote** June 2021 – August 2021
- Supported design, integration and deployment of robotic automated solutions for wireless technologies test systems
  - Identified and implemented improvements on existing robotic solutions
  - Designed custom fixtures as well as supported fast prototyping to fit the needs of the automated solutions
  - Selected and validated 3<sup>rd</sup> party vendor robotic solutions for desired applications
- C-Design Lab (Purdue University) - Research Assistant - West Lafayette, IN** May 2019 – Present
- Focused on user-centric research to develop products in the field of education, manufacturing and Mixed Reality
  - Developing tools to utilize spatial tutorials for knowledge and skill transfer using Augmented and Virtual Reality
  - Responsible for conducting elicitation interviews and prototype development to determine efficacy of tools and areas of improvement
  - Managing and coordinating a team of undergraduate students to create AR/VR applications for the lab's industry connections
- Purdue University – ME 444 Graduate Teaching Assistant – West Lafayette, IN** August 2020 – Present
- ME 444 is a computer aided designing and prototyping class popularly referred to as Toy Design offered to upperclassmen at Purdue
  - Conducted lectures to demo various features of Creo Parametric to utilize in 3D and 2D computer aided design
  - Streamlined hybrid class format of ME 444 to adapt to the difficulties of online classes during the Covid-19 pandemic
- Purdue University – GERI Toy Design Coach – West Lafayette, IN** June 2019 – August 2019
- Coached high school and middle school students through a rigorous syllabus specializing in robotics, design and rapid prototyping
  - Created detailed illustrative instruction manuals for activities tackling basic circuits using sensors and smartphone-controlled car design
  - Collaborated with a team of eight coaches during workshop to enable efficient learning
- Reydel Automotive India – Product Design Intern - Chennai, India** May 2018 – July 2018
- 3D modeled multiple inserts for instrument panel of a car in Catia v5 according to customer required tolerances and design constraints
  - Communicated with customer during design process to accommodate any required changes and adjustments to the design
  - In charge of designing glove-box hinge and bezels surrounding A/V Systems and side-view mirror controls

## PROJECT EXPERIENCE

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- MiniDog – A Budget Quadruped Robot with 3D-Printed Components and Hobby Electronics** December 2020 – Present
- Currently working on the mechanical design (using Creo) and fabrication for the chassis and passively compliant legs for the robot
  - Planning to implement inverse kinematics to create a controller to allow the robot to walk and automatically stabilize based on external forces on the leg and body in the future
- VeldeR – VR welding simulator** August 2020 – December 2020
- Designed and developed a user-centric, modular learning tool for welding based in a Virtual Environment enabled by the Oculus Quest
  - Traversed the Product Development Cycle including customer research, brainstorming, value creation, business model development to create the product
- KicksKleaner (Electronics Lead) – Senior Design Project** January 2020 – May 2020
- Designed an automated shoe cleaning, drying and disinfecting device to provide users with an alternative to machine-washing or expensive shoe cleaning products

- Created an interactive touch screen UI to allow the user to input shoe materials and desired cleaning processes that automatically switched the type of brushes, cleaning materials and processes without any manual user intervention

#### **Automated Bridge Damage Repair Robot**

**January 2020 – May 2020**

- Designed and developed an automated robot to detect bridge damages, log damage location and lay temporary patches over damages
- Utilized a Raspberry Pi to control movement of the robot, the patch-deployment mechanism and a PixyCam2 for damage detection

#### **Heating-Cooling Temperature Control**

**August 2019 – December 2019**

- Developed temperature control system to maintain temperature at a user-defined setpoint with a heater and cooling fan with an overshoot of less than 5% and a quick response time
- Implemented a PI controller for heater and an on/off controller for fan using an STM-32 ARM board programming in C

#### **Rocket Racers – A Two-Player Arcade Style Toy**

**January 2019 – May 2019**

- The main objective is to get a rocket to the moon first. The toy has three game-modes: Button Mash, Whack-A-Mole, Simon Says.
- Responsible for CAD design, rapid prototyping and electro-mechanical integration of the toy
- Awarded “Best Innovation Award” due to its complex integration of mechanical and electrical components

## **PUBLICATIONS**

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▫ Adam, G., Chidambaram, S., **Reddy, S. S.**, Ramani, K., & Cappelleri, D. J. (2021). *Towards a Comprehensive and Robust Micromanipulation System with Force-Sensing and VR Capabilities*. *Micromachines*, 12(7), 784.

▫ PAREDES, L., **REDDY, S. S.**, CHIDAMBARAM, S., VAGHOLKAR, D., ZHANG, Y., BENES, B., & RAMANI, K. (2021). *FabHandWear: An End-to-End Pipeline from Design to Fabrication of Customized Functional Hand Wearables*.