VIGNESH SUNDARARAJAN

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Education

Purdue University - School of Aeronautics and Astronautics — West Lafayette, USA
Master of Science - Aeronautics and Astronautics — 2021-Present
Coursework: Artificial Intelligence, Statistical Methods*, Autonomous Systems*, System of Systems Modeling and Analysis*
(* = Ongoing)

SRM University — Chennai, IN
Bachelor of Technology - Mechanical Engineering — 2016-2020

Skills

Spoken Languages: English, German (Elementary), Hindi, Marathi, Tamil
Programming: C++, Python, MATLAB, HTML, CSS, LaTeX
Frameworks/Libraries: openCV, ROS, numpy, PyTorch, Keras, Tensorflow, scikit-learn, matplotlib, pandas, seaborn
Tools: Git, Linux, CMake, GDB, LLDB, Docker, Jupyter, CARLA, Confluence, Jira
CAD/CAM/Simulation: Solidworks, Autodesk Fusion 360, CATIA, ANSYS
Technical: Machine Learning and Deep Learning, Computer Vision, Robotics (State Estimation and Localization, Perception, Motion Planning and Optimization), Systems Modelling and Analysis

Projects

Aerodynamics Team Member - Purdue Electric Racing — West Lafayette, USA
Purdue University — August 2021 - Present
- Designed CFD simulations to correlate Wind Tunnel testing data with simulated data, and achieved ~ 7% margin of error.
- Carried out carbon fiber layups for the construction of multi-element aerodynamic bodywork
- Currently designing a parametrized CFD study for optimizing airflow to the motor controller using an underbody ducting system.

Using a GAN with a Perceptual Loss Function for Image Super Resolution
Purdue University — August 2021 - December 2021
- Implemented a deep neural network with 16 Residual Blocks, and a Generator-Discriminator pair to upsample low resolution images by a factor of 4, using TensorFlow 2
- Trained the model for 50,000 steps on an Nvidia Tesla P100 GPU to analyse the discriminator and perceptual loss trends over time.
- Worked with ~ 10GB datasets using test/train splits for training the GAN

Vice Captain and Design Lead - Hawkz Racing — Chennai, IN
SRM University — 2017 - 2018
- Successfully managed a team of 30 people, working across multiple departments, to secure National Awards in Sales and Business Presentation, along with a National Rank of 4 at the Design Presentation.
- Oversaw the development of core vehicle components (Wheel assembly, Differential and Engine Mounts, Chassis), from design through to manufacturing and assembly.
- Tools used: Solidworks(CAD + Simulation), ANSYS (FLUENT, Mechanical)

Experience

Research Intern - Dept. of Aerospace Engineering — Kanpur, IN
Indian Institute of Technology - Kanpur — June 2019
- Worked at the Non-Equilibrium Flow Simulation laboratory to simulate the fluid flow through a CD Nozzle with supersonic jet control, by utilizing grid adaptation techniques and mesh independence studies to improve solver time.
- Tools used: ANSYS ICEM, ANSYS Mechanical, ANSYS FLUENT, PuTTY, HPC

Battery Thermal Simulation Intern — Chennai, IN
Grinntech Motors and Services - IIT Madras — June 2018
- Performed CFD and Heat Transfer simulations for different temperature ranges to analyze the Solidification/Melting of Phase Change Material as Thermal Management system for Battery Module
- Tools used: ANSYS FLUENT, ANSYS Mechanical