Jerrin Bright

3D Human Modeling · Realtime Perception · Autonomous Navigation

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Summary

My research focus revolves around the intersection of Computer Vision, Machine Learning, and Computer Graphics, particularly in the realm of 3D Human Modeling. I'm captivated by the prospect of enhancing our capacity to craft, manipulate, and control 3D human models through the application of diffusion models. This interest drives my pursuit to build robust systems that enable editability and control within the domain of 3D human representation.

Education

University of Waterloo
Ontario, Canada

MASc in Systems Design Engineering — *Sept 2022 - Present*

- **Research:** Robust Monocular 3D Human Pose and Shape Estimation for Baseball Pitch Analysis.
- **Supervisor:** Dr. John S Zelek.
- **Courses:** Probabilistic Machine Learning, Graphical Deep Learning, Advanced Image Processing (IP), Statistical IP.

Teaching Assistantship

SYDE 461
Systems Design Capstone Project 1 — *University of Waterloo*

Supervisor: Dr. Reem Roufail — *Sept 2023 - Present*

BME 361
Biomedical Engineering Design — *University of Waterloo*

Supervisor: Dr. Reem Roufail — *Jan 2023 - April 2023*

BME 101L
Communications in Biomedical Engineering- Visualization — *University of Waterloo*

Supervisor: Dr. Ewen MacDonald — *Sept 2022 - Dec 2022*

Bachelor's Thesis

Vellore Institute of Technology
Chennai, India

Supervisor: Dr. Arockia Selvakumar Arockia Doss — *Nov 2021 - April 2022*

- A robust learning-based obstacle avoidance method was proposed leveraging feature enhancing networks.
- An inspection module base on a novel sense-switch-act approach was designed and experimentation were done.
- Localization leveraging inertial data and sensor fusion via Extended Kalman Filters with ORB features were done.

Publication

Mitigating Motion Blur for Robust 3D Baseball Player Pose Modeling for Pitch Analysis
6th International ACM Workshop on Multimedia Content Analysis in Sports

Jersey Number Recognition using Keyframe Identification from Low-Resolution Broadcast Videos
6th International ACM Workshop on Multimedia Content Analysis in Sports

ME-CapsNet: A Multi-Enhanced Capsule Networks with Routing Mechanism
IEEE International Conference on Electronics, Computing & Communication Technologies

Optimization of quadcopter frame using generative design and comparison with DJI F450 frame
International Conference of Robotics, Intelligent Automation and Control Technologies

Area of Expertise

Programming Tools	**: Python, C++, Embedded System, HTML, CSS**
ML Tools	**: TensorFlow, PyTorch, OpenCV, Matplotlib, NumPy, Keras, Scikit**
Simulation Tools	**: AirSim, Fusion360, SolidWorks, Proteus, Gazebo, RViz, MATLAB, SOFA**
Operating System	**: Linux Ubuntu, ROS, Raspbian OS, Window**
Languages	**: English, Tamil**

Honors & Awards

International Master's Award of Excellence, University of Waterloo, Canada
Graduate Research Fellowship, University of Waterloo, Canada
Globalink Graduate Fellow, MITACS Canada
Outstanding Research Paper Award, RIACT International Conference, 2020
Best Outgoing Student, Atom Robotics, VIT Chennai, India, 2022.
Top Ten Internationally, International Planetary Aerial Challenge, 2021
Runner-up, IEEE Hackathon on Autonomous Drone Applications, 2021
Best Club Award, Robotics Club, University Day 2021, VIT Chennai, India.
Best Club Award, National Service Scheme, University Day 2022, VIT Chennai, India.

Research Experience

Indian Institute of Science
Bangalore, India

Research Intern, AI and Robotics Park (ARTPARK) — *July 2021 - April 2022*

- Autonomous navigation of UAVs in uncluttered and unstructured environments using various sensor sub-systems.
- Implementation of Model Predictive Control, Control Barrier Functions, DL based Depth Estimation, etc.
- Hands on with Jetson boards, Realsense, Jevios components and turtlebot, DJI M600, Jetbots and custom UAVs
- **Supervisors:** Mr. Badrinarayanan Rangarajan and Prof. Suresh Sundaram

McMaster University
Ontario, Canada

Globalink Research Intern — *July 2021 - September 2021*

- Designing of a 4 DoF soft robotic manipulator in PyBullet simulation engine using Soft Motion (SoMo) toolkit.
- Supplied sinusoidal torque to the actuators and plotted the velocity, position, acceleration, and input (torque) to analyze different actions.
- **Supervisor:** Prof. Gary Bone

Arizona State University
Arizona, USA

Summer Research Intern — *May 2021 - July 2021*

- Using laser scanning, and photogrammetry to digitize environments via visualizing data collected from sensors fusing into a unified system. DL algorithms are used for automated analysis.
- The digital representations made will be processed to provide insights to builders, and stewards.
- **Supervisor:** Prof. Thomas Czerniawsk

Aero2Astro
Chennai, India

Autonomous System Developer - Intern — *October 2020 - April 2021*

- Developing ROS-based autonomous navigation firmware using Visual Inertial SLAM concepts for indoor environment.
- Implementation was based on Sensor Fusion techniques, Extended Kalman Filters and is aimed to eradicate the need for GPS thus making the system/ firmware more reliable.
- **Supervisor:** Mr. Ted Solomom and Mr. Manikanta

BrainMagic InfoTech Pvt
Chennai, India

Data Science Intern — *May 2020 – July 2020*

- Automobile fault detection of more than 10 classes using vision techniques resulting in an IOU of 95%.
- Dimensional analysis was done to locate defects and monitor them.
- Performance was enhanced using transfer learning with residual networks and data augmentation.
- It was initially deployed in Heroku and finally deployed in AWS using Amazon Sagemaker and S3 Buckets.

Yuan-Ze University
Taoyuan City, Taiwan

Project Research Intern — *April 2020 – June 2020*

- Built a robust smart parking system using semantic segmentation with Convolutional Conditional Random Fields and Atrous Convolution enhance the visual capability of the system.
- **Supervisor:** Prof. Wei-Tyng Hong