

Jerrin Bright

SPORTS ANALYTICS · HUMAN POSE ESTIMATION · REALTIME PERCEPTION

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Summary

I am a versatile and self-motivated Master's student at UWaterloo focusing on human pose estimation and video analysis. As a researcher at the Vision and Image Processing Lab, I'm working jointly with the Baltimore Orioles of Major League Baseball (MLB) towards developing robust monocular human pose estimation solutions for quantitative analysis of baseball players to improve player performance, enable better strategic decisions, and aid in injury prevention.

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

SUPERVISOR: DR. REEM ROUFAIL

University of Waterloo

Sept 2023 - Present

BME 361

Biomedical Engineering Design

SUPERVISOR: DR. REEM ROUFAIL

University of Waterloo

Jan 2023 - April 2023

BME 101L

Communications in Biomedical Engineering- Visualization

SUPERVISOR: DR. EWEN MACDONALD

University of Waterloo

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 (ACCEPTED)

Jersey Number Recognition using Keyframe Identification from Low-Resolution Broadcast Videos

6TH INTERNATIONAL ACM WORKSHOP ON MULTIMEDIA CONTENT ANALYSIS IN SPORTS (ACCEPTED)

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

RESEARCH INTERN, AI AND ROBOTICS PARK (ARTPARK)

Bangalore, India

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

GLOBALINK RESEARCH INTERN

Ontario, Canada

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

SUMMER RESEARCH INTERN

Arizona, USA

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

AUTONOMOUS SYSTEM DEVELOPER - INTERN

Chennai, India

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

DATA SCIENCE INTERN

Chennai, India

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

PROJECT RESEARCH INTERN

Taoyuan City, Taiwan

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