Archana Swaminathan

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Links: Email | LinkedIn | Website

Research Interests: Computer Vision, Computer Graphics, Machine Learning, Deep Learning, Robotics

Education

- **Bachelor's in Engineering in Electronics and Instrumentation** — **BITS Pilani**
  Hyderabad, India — *Aug 2016 – May 2021*
  CGPA: 7.27/10.0
- **Master's in Science in Mathematics** — **BITS Pilani**
  Hyderabad, India — *Aug 2016 – May 2021*
  CGPA: 7.27/10

Skills

- **Specialized:** PyTorch | TensorFlow | CUDA | OpenGL | MeshLab | Blender | Keras
- **Programming:** C | C++ | MATLAB | MS Office | LaTeX | Python | Linux

Experience

- **V-SENSE, Trinity College Dublin** — **May 2020 – July 2021**
  Research Assistant — *Dublin, Ireland*
  - Worked under Dr. Aljosa Smolic as a research assistant for my undergraduate thesis.
  - Did research in estimating clothed human shape and democratizing training of deep learning models for the same.
  - Explored many approaches such as differentiable rendering and implicit functions to do the 3D human shape estimation, and compared between the same.
  - Created an open-source dataset to train models to learn clothed human shape and ran experiments to compare results with the current state-of-the-art. Submitted our work to the International Conference on 3D Vision, 2021.
- **BITS Pilani, Hyderabad Campus** — **Jan 2019 - Apr 2020**
  Undergraduate Research Assistant — *Hyderabad, India*
  - Undertook various formal and informal research projects throughout my course of study.
  - Worked under Dr. Manish Kumar, Dr. Rajesh Tripathy, Dr. Sudha Radhika and Dr. R.N Ponnalagu.
- **Robert Bosch R&D** — **May 2019 – Jul 2019**
  Research Intern — *Bangalore, India*
  - Worked on building Computer Vision algorithms for deployment of an end-to-end solution for achieving accurate product classification with limited training data in the retail environment.
  - Used the principle of few shot learning and a custom Convolutional Neural Network architecture to achieve a state-of-the art product rollout with end-to-end lightweight deep learning.
- **NTCL Mumbai** — **May 2018 – Jul 2018**
  Summer Intern — *Mumbai, India*
  - Developed a forecasting and predicting model for monthly capital budget allocations for the finance department of the company, as part of Practice School-1.
  - Used Artificial Neural Networks and LSTM-based Recurrent Neural Networks to build a predictive model for time-series patterned data and compared the performance of the two.

Projects

- **Structural Damage Detection using Convolutional Neural Networks** **Jan 2020 – May 2020**
  Formal Project
  - Did Semantic Segmentation using a custom CNN architecture to identify tornado damage that was done to building structures. Presented our work at the CMOS Congress, 2020.
- **Compressive Image Sensing and Denoising using Ramanujan Transforms** **Jan 2020 – Apr 2020**
  Formal Project
  - Used the Ramanujan Fourier Transform to do compressive sensing and denoising of images in the Ramanujan domain, using the Ramanujan basis as the overcomplete dictionary. Trained the dictionary with K-SVD based on OMP algorithm.
- **Contactless Gesture Recognition System using Proximity Sensors** **Aug 2019 – Dec 2019**
  Course Project for Transducers and Measurement Techniques
  - Built a custom proximity sensor using IR sensors that captures IR signals that recognizes the gestures left, right, push and pull by the means of a custom classification algorithm. An Arduino Uno microcontroller was used to do the programming.
- **Deep Learning for Image Encryption and Decryption** **Jan 2019 – May 2019**
  Formal Project
  - Developed a novel algorithm for image encryption using Artificial Neural Networks. Used a Product Neural Network to generate a unique key, which served as the bias for the initial ANN, which encrypted and decrypted the image.

Publications

Conferences

- **International Conference on 3D Vision 2021:** V-Human: An open synthetic dataset to learn clothed human shape (Submitted)
- **54th Canadian Meteorological and Oceanographic Society (CMOS) Congress:** Tornado Damage Estimation by Combining Wavelet and CNN Based Technology from UAV (Drone) Database (Presentation at Congress).

Achievements

- **Google Research India - AI Summer School** **Aug 2020**
  Selected and Attended
  - Was selected to attend and participate in the Google Research India- AI Summer School, 2020.
  - Was part of the top 150 people to get selected out of thousands of applicants.
- **Flipkart GRiD 2.0 Hackathon** **Aug 2020 – Sep 2020**
  Participated in the Hackathon
  - Made it to the semifinals of the Flipkart Nationwide Machine Learning Hackathon
  - Built a Fashion Intelligence System that ranks e-commerce products and predicts fashion trends.
  - Stood 30th in the country in Round 1 and made it to the top 60 by the last round, out of 15000 participants.

Clubs and Fest Organizing Departments

- Student Representative, Disciplinary Committee
- Online Publicity Head for Verba Maximus, the Literary Fest
- Treasurer of the Journal Club and Core Member (2016 - 2020)
- English Language Activities Society (ELAS) (2016 - 2020)
- Axiom, the Mathematics Association (2016- 2017)
- Department of Publicity and Public Relations (2016 - 2018)
- Debating Society (2016 - 2018)