BENEDICT FLORANCE AROCKIARAJ

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EDUCATION

University of Pennsylvania *(MSE in Computer and Information Sciences)* *August '21 - May '23*

Courses: Advanced Machine Perception, Learning in Robotics, Reinforcement Learning, NLP, Advanced Algorithms

Teaching: Principles of Deep Learning, Applied Machine Learning *CGPA:* ***4.0/4.0***

National Institute of Technology, Trichy *(B. Tech. Honors in Computer Science)* *July '16 - July '20*

Courses: Probability, ML, AI, Image Processing, Data Mining *CGPA:* ***9.47/10*** | **2nd/104** *students*

MOOCs: Deep Learning Specialization, MLOps Specialization *(Coursera)*, CNNs for Visual Recognition *(Stanford Online)*

SKILLS

Languages and Web Development: C/C++ • Python • HTML • CSS • Angular • Javascript • PHP • Laravel • SQL

Tools and Frameworks: PyTorch • Tensorflow • OpenCV • Numpy • Git • Docker • Google Cloud • BigQuery • AWS

EXPERIENCE

Cruise **San Francisco, USA**

Machine Learning Engineer Intern (Trajectory Prediction Team) *May 2022 - August 2022*

• Developed data, pre-processing and modeling pipeline for Transformers, GNNs-based trajectory prediction architecture that acts on vectorized map and agent information. Improved prediction quality through lossless and long-range feature representation, reduced prediction latency by *20%*, and improved training and validation speeds by *33%*.

Infilect **Bangalore, India**

Machine Learning Engineer (Full Time) *Nov 2020 - July 2021*

• Built deep-learning pipelines using object detection, segmentation, fine-grained classification and self-supervised learning for retailers like Kimberly Clark, P&G, Lowe's, Coke and ABInBev to provide real-time competitive intelligence and on-shelf execution insights. Achieved *>97%* accuracy in detecting the smallest of SKUs and lifted per-store sales by *5%*.

Indian Institute of Science *(VAL Lab)* **Bangalore, India**

Research Intern | Guide: Prof. Dr. R. Venkatesh Babu *May 2020 - August 2020*

• Wrote data-loaders and modeled the architecture for kinematic-structure preserving, unsupervised 3D pose estimation framework to effectively disentangle pose, foreground and background appearance information. Reduced MPJPE by as high as *40%* (semi-supervised) and *15%* (unsupervised) on datasets like Human3.6M, 3DHP, LSP and 3DPW.

University of Quebec *(LIVIA Lab, ETS Montreal)* **Montreal, Canada**

Visiting Research Intern | Guide: Prof. Dr. Éric Granger *May 2019 - Aug 2019*

• Analyzed negative transfer (around *20%* drop in mAP from baseline) and catastrophic forgetting of the existing image-to-image domain adaptation approaches on face-detection datasets, and studied the use of local features, and temporal information from trackers to generalize unsupervised domain adaptation approaches on datasets like SCUT and Widerface.

PROJECTS

Unsupervised Reinforcement Learning via World Models *(with Prof. Kostas Daniilidis)* *January 2022 - Present*

• Designing a model-based reinforcement-learning approach via world models using a novel combination of intrinsic and sparse extrinsic reward for robotic manipulation tasks in MetaWorld and adapting to new tasks exploiting prior experience.

Counting Machine Washer Parts *(Industrial Challenge)* *July 2021 - August 2021*

• Extended density-map estimation based FamNet to count highly-occluded machine parts with a novel mismatch loss component, achieving a performance of *1.96* MAE (*90%* decrease from image processing baseline) on the challenge dataset.

Sensible Universal Adversarial Triggers *July 2021 - Dec 2021*

• Developed POS filtering and perplexity based loss to generate sensible universal adversarial triggers achieving accuracy as low as *4%* for sentiment analysis on SST dataset. Performed adversarial defense increasing the accuracy from *12%* to *48%*.

AWARDS

• Received the prestigious **Vector Scholarship in Artificial Intelligence** from the Vector Institute, Toronto

• Secured the coveted **Mitacs Globalink Research Internship** award to perform research at LIVIA, ETS Montreal

• Awarded the **Indian Academy of Sciences' Research Fellowship** to conduct research at CVIT, IIIT-Hyderabad