Dwait Bhatt

dhbhatt@ucsd.edu | dwait.bhatt@gmail.com | (858) 319-6716 | linkedin.com/in/dwait-bhatt

SUMMARY

Robotics graduate student at UCSD with 3 years of AI R&D experience at Samsung Research and ISRO. Seeking to conduct research in reinforcement learning and apply it to real-world use cases.

SKILLS

Relevant Coursework: Robot Reinforcement Learning, Visual Learning, Deep Generative Models, Sensing & Estimation in Robotics, Probabilistic Reasoning, Statistical Learning, Information Retrieval, Pattern Recognition
Programming Languages: Python, C++, Matlab
Libraries: PyTorch, Keras, Numpy, Pandas, OpenCV, Open3D

EDUCATION

University of California, San Diego — **Expected Graduation: June 2024**
MS in Electrical & Computer Engineering - Intelligent Systems, Robotics & Control — *San Diego, California*

Birla Institute of Technology and Science, Pilani (BITS Pilani) — **June 2019**
BE (Hons.) in Electrical & Electronics Engineering - CGPA: 8.29/10 — *Pilani, Rajasthan*

EXPERIENCE

Existential Robotics Laboratory — **January 2023 - Present**
Graduate Researcher — *San Diego, California*

- Created a sim-to-real pipeline for transferring learned robosuite policies to a physical robot arm, using multiple sensors including a RealSense RGBD camera for tasks such as object pose estimation and hand-eye calibration. Successfully executed lift, pick-and-place, and stack policies on an xArm6 robot with sub-5mm error.
- Currently engaged in transfer learning across robot types by leveraging policies encoded to a latent space.

Samsung R&D Institute India — **July 2019 - August 2022**
Senior Machine Learning Engineer — *Bangalore, Karnataka*

- Spearheaded the development of a patented application launch time prediction model, from a python POC to an on-device implementation in C++, which was used to boost CPU for an optimal duration to make application launches 6% faster while extending battery life by 2 hours.
- Saved 10 days per quarter of manual work by creating a python tool to extract user-perceived launch time from app launch videos using a novel algorithm based on structural similarity between consecutive video frames.
- Authored a research paper based on this work and presented it at IEEE IJCNN 2022 held in Padua, Italy.
- Guided a team of four undergraduate students through a sequence prediction project as their mentor for Samsung's industry–academia collaboration program, PRISM.

Machine Learning Engineer

- Designed a reinforcement learning agent that trained on-device to control an Android smartphone's kernel tunables, reducing the decoding time of encrypted models by 10% on Samsung's flagship phones.
- Visualized the agent's performance and automated kernel tunable evaluation to identify an action set with the highest impact on model decryption time.

Indian Space Research Organisation (ISRO) — **September 2021 - January 2022**
Research Trainee — *Ahmedabad, Gujarat (Remote)*

- Implemented a deep reinforcement learning network in PyTorch trained using policy gradients to drop non-essential image patches from CIFAR10 data while maintaining classification accuracy of 90%. This work is being extended to satellite images for efficient poverty estimation from remote sensing imagery.

Pixxel — **August 2018 - December 2018**
Machine Learning Engineer — *Pilani, Rajasthan*

- Performed semantic segmentation of satellite imagery with a U-Net to identify roads and buildings with an IoU of 0.7.
- Applied classical image processing algorithms for water body extraction from multispectral satellite images.

PROJECTS

Musical Accompaniment Generation using Language Modeling | *PyTorch* | UCSD — **April 2023 – June 2023**

- Designed a novel architecture for accompaniment generation conditioned on a vocal track using language modeling.
- Achieved semantically meaningful generation (FAD 4.07) with minimal training in contrast to current large models.

Surface Reconstruction using Locally-Aware NeRFs | *PyTorch* | UCSD — **April 2023 – June 2023**

- Tackled the issue of missing local information in the NeRF architecure by introducing features from a Convolutional Occupancy Network. This enabled smoother surface reconstruction of complex geometries and large-scale scenes.

Curiosity-driven Robot Reinforcement Learning | *PyTorch* | UCSD — **January 2023 – March 2023**

- Introduced curiosity-based intrinsic motivation in robots for manipulation tasks via Random Network Distillation. Found that such exploration hurt the performance for robotic tasks in contrast to RND's success in playing video games.