Krishna Wadhwani

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EDUCATION

INDIAN INSTITUTE OF TECHNOLOGY BOMBAY
B.Tech (with Honors) in Aerospace Engineering
Minor in Computer Science and Engineering
CPI: 9.13 / 10.0 | 2016-20 | Mumbai, India

BSS PRANAVANANDA ACADEMY
Till Intermediate (/+2) (CBSE)
CPI: 94.6% | 2014-16 | Raipur, India

RAJKUMAR COLLEGE
Till Matriculation (ICSE)
CPI: 96.2% | 2002-14 | Raipur, India

UNDERGRADUATE THESIS

CONTROLLABLE GENERATIVE MODELS 2019-20
Guide: Prof. SP. Awate. Prof. P. Ramachandran
Manuscript of the work submitted to Pattern Recognition. Received Undergraduate Research Award for exceptional work in the thesis

- Developed a **novel method** for **controllable face image generation** based on **deformable-mean-template** learning, **appearance-geometry disentanglement** and **semi-supervised learning** of facial attributes
- Demonstrated utility of the method on CelebA and LFW dataset for **image representation, attribute manipulation** and **geometry swapping**
- Further applied generative models in aerospace settings - **airport security** and **turbulent flow simulation**

INTERNSHIPS

SONY JAPAN 2019
Vision System Development

- Implemented **Single Shot MultiBox Detector** in Nnabla with ResNet50 as backbone model on COCO '17 data
- Performed detailed profiling analysis **Nvidia's Visual Profiler** to find auto forwarding bug in Nnabla's pretrained ResNet API which resulted in **16 % performance improvement**
- Further Implemented AutoRegressive Vision models - **PixelCNN** and **gated PixelCNN** and **Vector Quantized Variational AutoEncoders** in Nnabla on MNIST, CIFAR10 and ImageNet dataset
- Offered a Pre-Placement Offer for the work during the internship

SEASONS OF CODE, WNCC 2018
Neural Machine Translations

- Implemented a **multi-decoder module** with **modified loss** in **attention based encoder-decoder** architecture with **LSTMs** and beam search for **language translation**

SCHOLASTIC ACHIEVEMENTS

- **Department rank 3** in Aerospace Engineering IIT Bombay
- JEE Advanced Rank: 985 (99.5 percentile)
  JEE Mains Rank: 1208 (99.9 percentile)

RESEARCH AND DEVELOPMENT

DEEP NEURAL NETWORKS 2018–19
Guide: Prof. Manoj Gopalkrishnan
Received Undergraduate Research Award for preliminary RnD

- Implemented **Capsule Networks** using **TensorFlow-GPU** on MNIST dataset to achieve a **99.53 % accuracy**
- Implemented **novel Neural Architecture Search** with iterative layer wise growth and training

N-BODY SIMULATION 2018

- Used **gprof** to profile the serial code for calculation of trajectory of n bodies and determine the parallel algorithm
- Parallelised the serial code with **openMP** and **MPI** to get a **speedup of 6 times** over the serial code

ACTIVE APPEARANCE MODELS 2020

- Implemented independent Active Appearance Models for **modeling of texture and geometry** using procrustes analysis
- Able to faithfully represent a 800x600 test image with as few as 63 parameters

REINFORCEMENT LEARNING ALGORITHMS 2017

- Solved **gym's** CartPole environment with deep reinforcement learning algorithms such as **Policy Gradients, Q-learning** (with experience replay) and **Actor-Critic algorithm** in **PyTorch**

WAREHOUSE INVENTORY CHECK 2018
InterIIT Tech Contingent Meet

- Part of a 4 member team selected to **represent IIT Bombay** at a competition organized by Honeywell
- Built an **autonomous quadcopter** for indoor navigation + QR code extraction with **px4Flow sensor** + **odroid xu4**

ROLES

2018	**Co-founder** : Autonise AI Pvt. Ltd.
2018-19	**Department Academic Mentor** : IIT Bombay
2020	**Programme Committee Member** : ECML-PKDD

SKILLS

PROGRAMMING
Python • C • C++ • Javascript • Latex • MatLab
TOOLKITS
PyTorch • Nnabla • TensorFlow • OpenGL • OpenCV
DALI • CUDA • OpenCL • MPI • OpenMP • Django

MISCELLANEOUS

Completed **80+ hours of social service** under National Service Scheme, IIT Bombay