

Vaibhav Balloli

Research Fellow
Microsoft Research
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EDUCATION

BITS Pilani, Hyderabad Campus

2016 - 2020

B.E in Electronics and Communication Engineering

GPA: 8.49/10

TOEFL: 111, GRE: 324

RESEARCH EXPERIENCE

Microsoft Research India

June 2022 - Present

Research Fellow

Advisors: Dr. Akshay Nambi & Tanuja Ganu

Microsoft Research India

June 2021 - June 2022

SCAI Research Fellow

Advisors: Dr. Akshay Nambi & Tanuja Ganu

Distributed Systems and Algorithms Lab, IST Austria

June 2020 - April 2021

Research Intern

Advisors: Prof. Dan Alistarh & Dr. Razvan Pascanu

PUBLICATIONS

Under review

2. **EnCortex: A General, Extensible and Scalable Framework for Decision Management in New-age Energy Systems**

Vaibhav Balloli, Millend Roy, Anupam Sobti, Tanuja Ganu, Akshay Nambi.

Topics: Large-scale Reinforcement Learning(Model-free, Offline), Imitation Learning, Integer Linear Programming. NSDI'23

1. **Chanakya: Learning Tradeoffs for Adaptive Streaming Perception via Contextual Bandits**

Anurag Ghosh, **Vaibhav Balloli**, Aditya Singh, Harish YVS, Akshay Nambi, Tanuja Ganu.

Topics: Contextual Bandits, Streaming Object Detection and Tracking, Reward design. MobiCom'23

Conference Publications

1. **Video Streaming using Scalable Video Coding over Opportunistic Networks**

Abhishek Thakur, **Vaibhav Balloli**, Arnav Dhamija.

WiSPNET'19

Theses

1. **Multi-objective Neural Architecture Search via Reinforcement Learning.**

Vaibhav Balloli.

Undergraduate Thesis, 2020.

SOFTWARE

1. **EnCortex - Stochastic Optimization for Renewable Energy sources[Under Patent Review].**

Microsoft Research India

Reinforcement Learning | Stochastic Optimization | MLOps

RL and Stochastic optimization algorithms running large-scale optimizations that are currently used by customers at Microsoft to maximize their profitability and sustainability goals.

2. **Automated License Testing - Microsoft Research India.**

Microsoft Research India

Visual SLAM | Object Detection | Video Processing

Stats as of August 2022: 🏆4 deployed

INTERNSHIPS

1. AlphaICs.ai

- Devised efficient data structures, algorithms and protocols for AlphaIC's AI accelerator and deep learning library.
- Built an application in python for inter-operability of deep learning models and quantization of these models for faster inference using Tensorflow, ONNX and PyQT5.

PROJECTS

1. Offlax

Offline Reinforcement Learning library in JAX. Implements SOTA algorithms with an efficient file IO interface.

2. NFNets and Adaptive Gradient Clipping [GitHub](#) 317★

Re-implemented DeepMind's NFNets and Adaptive Gradient Clipping for all optimizers in PyTorch.

3. SmartCampus

- Co-founded SmartCampus, a student group who setup the Cashless system on campus, handling transactions worth 25 million rupees during my tenure.
- Built an Android app and a web-backend on a free-server to handle **3000 active users per minute**.
- Built a prototype recommender system yet to be deployed on the production-server using information retrieval and modern recommender system techniques.

4. VECTORS

- Scalable Video Coding encoded video on a DTN(Disruption Tolerant Network) developed for Android devices under the supervision of Dr. Abhishek Thakur.
- Developed an Android App cross-compiling SHM and JSVC for ARM processors to encode recorded video to send on the network
- Used Opportunistic Network Environment(ONE) to run simulations and automatic generation of reports from results.

5. Open Source: Google's Swift For Tensorflow, JAX/Flax

- Contributed to the core framework implementing different optimization algorithms and layers.
- Image classification models to the Swift for Tensorflow models repository.
- Feature additions to JAX/Flax.

SELECT AWARDS AND HONORS

- **Press:** HAMS Automated License Testing featured in Punjab News Express 2022
- **Winner** of Microsoft Global Hackathon, 2021(Future Of Edge Computing Track) 2021
- Selected to attend RegML 2020 and Convex Optimization summer school. 2020
- IST Austria stipend for visiting researchers 2020.
- **SmartCampus** handles **₹25 million** in transactions. 2020
- Talk at WiSPNET'19 presenting our paper Video Streaming using Scalable Video Coding over Opportunistic Networks(VECTORS). 2019

PROFESSIONAL RESPONSIBILITIES

1. Head of SmartCampus at BITS Pilani Hyderabad Campus

2. Organizer of ML Reading Group at BITS Pilani Hyderabad Campus

3. Mentorship

- Jonathan Samuel (Research Intern @ MSR -> SDE Gojek)
- Isha Singh (Research Intern @ MSR)