

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 board 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)