

# Vaibhav Balloli

Research Fellow  
Microsoft Research  
Bengaluru, India

✉ balloli.vb@gmail.com  
🏠 vballoli.github.io  
🎓 Google Scholar

## EDUCATION

---

### **BITS Pilani, Hyderabad Campus**

2016 - 2020

*B.E in Electronics and Communication Engineering*

GPA: 8.46/10

TOEFL: 111, GRE: 324(Q:169,V:155)

## 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)