

# Vaibhav Balloli

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## Academic Education

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

**Hyderabad, India**

- *BE (Hons) Electronics and Communication Engineering, CGPA: 8.46/10* *May 2020*
- Undergraduate Electives:** Information Retrieval, Machine Learning, Game Theory, Computer Graphics, Operating Systems, FPGA Systems and Design, Cryptography, Computer Architecture
- Coursera:** Reinforcement Learning(UoAlberta), Deep Learning(deeplearning.ai), Data Structures and Algorithms(UCSD), Bayesian Methods for Machine Learning(NRUHSE)

## Skills

- **Programming languages:** C, C++, Python, Swift, Java, Julia, Verilog, Javascript, MATLAB, Bash
- **Frameworks and tools:** PyTorch, TensorFlow, Swift for TensorFlow, SymPy, Numpy, ROS, sklearn, PyQt5, Django, Django Rest Framework, NodeJS, OpenGL, OpenCL, CUDA, Git, L<sup>A</sup>T<sub>E</sub>X, Xilinx ISE
- **Hardware:** Raspberry Pi, NVidia Jetson, TX1, TX2, Arduino, Xilinx FPGA, Sensors, Wireless modules, Soldering, Quadcopters

## Internships

### **Distributed Algorithms and Systems Lab IST, Austria(remote, covid)**

**Hyderabad, India**

*Visiting Scientist, Research*

*May 2020*

- Working on model compression under Dr. Dan Alistarh

### **CANDLE Labs**

**IIT Hyderabad, India**

*Neural Architecture Search for GPU-like hardwares, Undergrad Thesis*

*August - December 2019*

- Studied Neural Architecture Search for designing low latency, energy-efficient neural network architectures for GPUs under Prof. Sparsh Mittal
- Implemented Efficient NAS algorithm using PyTorch
- Used PyTorch wrappers for CUDA for benchmarking and objective function implementation

### **AlphalCs**

**Bangalore, India**

*AI Intern*

*June - August 2019*

- Devised efficient data structures, algorithms and protocols for AlphalC'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

### **VECTORS**

**Hyderabad, India**

*VidEo Comm. Through Opportunistic Relays and Scalable Video Coding*

*September 2018 - January 2019*

- Worked on Scalable Video Coding encoded video on a DTN(Disruption Tolerant Network) developed for Android devices under Prof. Abhishek Thakur [1]. Presented Camera-ready paper at WiSPNET 2019, Chennai, India.
- 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

### **SmartCampus**

**Hyderabad, India**

*Co-Founder / Developer*

*September 2017 - May 2019*

- Co-founded SmartCampus, a student group who setup the Cashless system on campus, handling transactions worth 15 million rupees every year
- Built and deployed an Android app to make cashless payments on campus sustaining an active user count of 50 per cent of campus population
- Built a prototype recommender system yet to be deployed on the production-server using information retrieval and modern recommender system techniques

## Open Source.....

### **TorchCompress**

*PyTorch Hackathon 2020*

**Hyderabad, India**

2020

- Library to improve ease of research in model compression.

### **PrivJAX**

*JAX*

**Hyderabad, India**

2020

- Currently working on the JAX port of tensorflow's differential privacy library.

### **TensorFlow**

*Swift for TensorFlow*

**Hyderabad, India**

2020

- Contributed to core Swift for TensorFlow APIs in optimizers, layers.
- Added image classification models to the S4TF models repository

### **Google**

*JAX*

**Hyderabad, India**

2020

- Contributed to activation functions in the Google JAX framework

## Miscellaneous.....

- ML Reading Group:** Founded and organized ML reading group discussing various papers in ML.
- Research papers:** Weekly blog summarizing and reviewing research papers in the fields of Convex Optimization, Federated Learning and Machine Learning Systems.
- Reinforcement Learning:** Blog summarizing concepts, algorithms and developments in Reinforcement Learning.

## Clubs.....

**Automation and Robotics Club(Member):** Conducted introductory Arduino and Robotics workshops, built quadcopters.

## Publications.....

- [1] Thakur, Abhishek, Vaibhav Balloli, and Arnav Dhamija. "Video Streaming using Scalable Video Coding over Opportunistic Networks." 2019 International Conference on Wireless Communications Signal Processing and Networking (WiSPNET). IEEE, 2019. DOI: 10.1109/WiSPNET45539.2019.9032752

## Achievements and Scholarships.....

- IST Austria stipend for visiting researchers
- Selected to attend RegML 2020 and Convex Optimization summer school.
- 3rd in In-Class Kaggle Competition at BPHC
- SmartCampus featured in campus journals and interviews.