

# Vaibhav Balloli

Ph.D. student  
University of Michigan  
Ann Arbor, MI

✉ [balloli.vb@gmail.com](mailto:balloli.vb@gmail.com)  
🏠 [vballoli.github.io](https://vballoli.github.io)  
🎓 [Semantic Scholar](#)  
🔗 [vballoli](#)

## EDUCATION

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### University of Michigan, Ann Arbor

2023 - Present

*Ph.D. in Computer Science and Engineering*

Advisor: [Prof. Elizabeth Bondi-Kelly](#)

GPA: 4.07/4.0. Courses: Reinforcement Learning Theory, NLP, HCI, AI, Causal ML, Advanced Data Mining

**Research:** Build Human-Centered AI models and HCI tools capable that can include and aide human expertise to alleviate social issues

### BITS Pilani, Hyderabad Campus

2016 - 2020

*B.E in Electronics and Communication Engineering*

## RESEARCH EXPERIENCE

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### Microsoft Research India

June 2022 - June 2023

*Research Fellow*

Advisors: [Dr. Akshay Nambi](#) & [Tanuja Ganu](#)

Topics: Reinforcement Learning, Integer Linear Programming, Large-scale Optimization, Large Language Models.

Projects: [Vasudha](#), [VeLLM](#): [VeLLM Press](#) - [Satya Nadella](#), [Times of India](#)

Impact: VeLLM is currently being deployed in schools across India

### Microsoft Research India

June 2021 - June 2022

*SCAI Research Fellow*

Advisors: [Dr. Akshay Nambi](#), [Tanuja Ganu](#) & [Dr. Venkat Padmanabhan](#)

Topics: Computer Vision, Contextual Bandits, Visual Localization, End-to-End systems

Projects: [HAMS](#): [HAMS Press](#) - [Punjab News Express](#)

Impact: HAMS is successfully deployed across India

## PUBLICATIONS

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### Conference Publications

3. [Are They the Same Picture? Adapting Concept Bottleneck Models for Human-AI Collaboration in Image Retrieval](#)

Vaibhav Balloli, Sara Beery, Elizabeth Bondi-Kelly

Topics: Human-AI Collaboration, Image Retrieval, Explainability, Wildlife Conservation

*IJCAI'24 Human-Centered AI Track* | [Code](#) | [Project](#) | - [<5% Acceptance Rate](#)

2. [Chanakya: Learning Tradeoffs for Adaptive Streaming Perception via Contextual Bandits](#)

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

Topics: Object detection and tracking, Computer Vision, Multi-arm bandits

*NeurIPS'23* | [Talk](#) | [Code](#)

1. [Video Streaming using Scalable Video Coding over Opportunistic Networks](#)

Abhishek Thakur, Vaibhav Balloli, Arnav Dhamija.

Topics: Delay-Tolerant Networks, Video Compression

*WiSPNET'19* | [Code](#)

### Workshop papers

1. [Are They the Same Picture? Adapting Concept Bottleneck Models for Human-AI Collaboration in Image Retrieval](#)

Vaibhav Balloli, Sara Beery, Elizabeth Bondi-Kelly

Topics: Human-AI Collaboration, Image Retrieval, Wildlife Conservation

*CVPR'24 @ CV4Animals Workshop*

### Theses

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

Vaibhav Balloli.

Undergraduate Thesis, 2020. A Grade.

## Under review

2. **Bridging the Gap: Dynamic Learning Strategies for Improving Multilingual Performance in LLMs**  
Somnath Kumar\*, **Vaibhav Balloli\***, Mercy Ranjit, Kabir Ahuja, Tanuja Ganu, Sunayana Sitaram, Kalika Bali, Akshay Nambi  
*Topics: Large Language Models, Multilingual Evaluation, Human Feedback.*  
[Preprint](#)
1. **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.*

## SELECT AWARDS AND HONORS

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- Awarded Weinberg Institute Travel Grant to attend CVPR'24 - \$1000 2024
- 2nd Place in the Google x MHacks Hackathon - \$1500 [Press: Mentioned by labs.google](#) 2024
- **Press: VeLLM** mentioned by [Satya Nadella](#) and featured in [Times Of India](#), [FirstPost](#) 2024
- Awarded Rackham Travel Grant to attend and present at NeurIPS'23 2023
- Selected for the [Harvard/MIT - HAIST/MAIA Intro Fellowship](#) on AI Safety 2023
- **Press: HAMS** Automated License Testing featured in [Punjab News Express](#) 2022
- **Winner** of [Microsoft Global Hackathon, 2021\(Future Of Edge Computing Track\)](#) 2021
- **SmartCampus** successfully managed **₹25 million** in transactions 2020
- Talk at WiSPNET'19 presenting our paper Video Streaming using Scalable Video Coding over Opportunistic Networks(VECTORS) 2019

## SERVICE

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- Conference Reviewer: AAMAS'25, ICLR'25 and NeurIPS'24.
- Workshop Reviewer: CV4Animals@CVPR'24, CompSust@ NeurIPS'23.

## PROFESSIONAL RESPONSIBILITIES

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- Editor for Michigan AI Blog
- Selected as Teaching Assistant for ClimateChange.ai Summer School 2023
- **Head of SmartCampus** at BITS Pilani Hyderabad Campus
- **Member of Automation and Robotics Club** at BITS Pilani Hyderabad Campus. Organized microcontroller workshop for a group of 100 students
- **Volunteer** at ClimateChange.ai
- **Founder and Organizer** of ML Reading Group at BITS Pilani Hyderabad Campus
- **Mentorship**
  - Jonathan Samuel (Research Intern @ MSR -> SDE Gojek )
  - Isha Singh (Research Intern @ MSR)

## SOFTWARE

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1. **EnCortex - Stochastic Optimization for Renewable Energy sources.**  
*Microsoft Research India*  
Reinforcement Learning(PyTorch, Stable-Baselines3) | Stochastic Optimization | MLOps on Azure.  
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*  
This system contains Computer Vision algorithms that perform Visual SLAM, Object Detection, and Trajectory analysis. As of August 2022, 📍 4 sites have been deployed successfully in different parts of India.