

Yash Sanjay Bhalgat

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EDUCATION

University of Oxford

Oct '21 - Oct '25 (Expected)

PhD (DPhil), Computer Vision and Machine Learning @ Visual Geometry Group (VGG)

Advisors: Prof. Andrew Zisserman, Prof. Andrea Vedaldi, Dr. João Henriques, Dr. Iro Laina

University of Michigan, Ann Arbor

Sep '17 - Dec '18

Masters, Computer Science and Engineering

Indian Institute of Technology, Bombay

Jul '13 - May '17

B.Tech. (with Honors) in Electrical Engineering with Minor in Computer Science

Undergraduate Research Award (URA 02) for exceptional Bachelors Thesis, Advisor: Prof. Vikram Gadre

WORK EXPERIENCE

Meta Reality Labs, Research Scientist Intern

[Apr '25 - Ongoing]

- Building large-scale generative 3D/4D foundation models for World Modeling and photorealistic Video Generation.

Multiple startups, Part-time AI Consultant

[Feb '23 - Mar '25]

- AI chip company: Developing real-time low-power Computer Vision algorithms for augmented reality on smart glasses.
- Content moderation company: Deploying Large Language Model (LLM) solutions to moderate multimodal data online.
- Togal.AI: Building multimodal solutions for detecting and understanding project features on architectural plans/drawings.

Qualcomm AI Research

Senior Machine Learning Researcher

[Nov '20 - Jul '21]

Machine Learning Researcher

[Jun '19 - Oct '20]

- Spearheaded the ultra-low resource always-on vision project from model design, quantization to final hardware mapping
- Filed 12 inventions in 2020-21 of which 6 ideas have been filed for patent protection. Notable works on 3D hand-pose estimation [DIR-Net], low-bit quantization [LSQ+, QKD], structured [StructConv] and unstructured [LTP] pruning
- Led Qualcomm's team in the MicroNet Challenge at NeurIPS 2019, and achieved 3rd position in ImageNet track [Code]
- Managed/mentored interns - Jangho Kim and John Yang (PhD @ SNU) with contributions to the AR/VR project

Voxel51, Inc., Computer Vision & Machine Learning Engineer

[Feb '19 - May '19]

- Researched and developed production pipelines for real-time vehicle tracking for querying on large-scale video databases

SELECTED PUBLICATIONS

Conference Publications (Full list: [Google scholar](https://scholar.google.com/citations?user=yashsb))

* equal contribution

- 3D-Aware Instance Segmentation and Tracking in Egocentric Videos. [Paper]
ACCV, 2024. Yash Bhalgat*, Vadim Tschernezki*, Iro Laina, João Henriques, Andrea Vedaldi, Andrew Zisserman.
- N2F2: Hierarchical Scene Understanding with Nested Neural Feature Fields. [Paper]
ECCV, 2024. Yash Bhalgat, Iro Laina, João Henriques, Andrew Zisserman, Andrea Vedaldi.
- SiLVR: Scalable Lidar-Visual Reconstruction with Neural Radiance Fields for Robotic Inspection. [Paper]
ICRA, 2024. Yifu Tao, Yash Bhalgat, Lanke Frank Tarimo Fu, Matias Mattamala, Nived Chebrolu, Maurice Fallon.
- Neural Refinement for Absolute Pose Regression with Feature Synthesis. [Paper]
CVPR, 2024. Shuai Chen, Yash Bhalgat, Xinghui Li, Jiawang Bian, Kejie Li, Zirui Wang, Victor Adrian Prisacariu.
- Contrastive Lift: 3D Object Instance Segmentation by Slow-Fast Contrastive Fusion. [Paper][Code]
NeurIPS, 2023 (Spotlight). Yash Bhalgat, Iro Laina, João Henriques, Andrea Vedaldi, Andrew Zisserman.
- A Light Touch Approach to Teaching Transformers Multi-view Geometry. [Paper]
CVPR, 2023. Yash Bhalgat, João Henriques, Andrew Zisserman.
- A Prompt Array Keeps the Bias Away: Debiasing Vision-Language Models with Adversarial Learning. [Paper]
AAACL-IJCNLP, 2022. Hugo Berg, Siobhan Hall, Yash Bhalgat, Wonsuk Yang, Hannah Kirk, A. Shtedritski, M. Bain.
- Dynamic Iterative Refinement for Efficient 3D Hand Pose Estimation. [Paper]
WACV, 2022. John Yang, Yash Bhalgat, Simyung Chang, Fatih Porikli, Nojun Kwak.
- Structured Convolutions for Efficient Neural Network Design. [Paper]
NeurIPS, 2020. Yash Bhalgat, Yizhe Zhang, Jamie Lin, Fatih Porikli.
- Teacher-Student Paradigm for Tri-training: An Efficient Method for Unlabeled Data Exploitation. [Paper]
KONVENS, 2019. Yash Bhalgat, Zhe Liu, Pritam Gundecha, Jalal Mahmud, Amita Misra.
- CatsEyes: Categorizing seismic structures with scattering wavelet networks. [Paper] [Poster]
ICASSP, 2018. Yash Bhalgat, Laurent Duval, Jean Charlety.

Workshop Publications

2. LSQ+: Improving low-bit quantization through learnable offsets & better initialization. *Yash Bhalgat*, Jinwon Lee, Markus Nagel, Tijmen Blankevoort, Nojun Kwak. **CVPRW Efficient Deep Learning in Computer Vision, 2020** [Paper]
1. Annotation-cost Minimization for Medical Image Segmentation using Suggestive Mixed Supervision Fully Convolutional Networks. *Yash Bhalgat**, Meet Shah*, Suyash Awate. *Medical Imaging meets NeurIPS, 2018* [Paper]

Unpublished Manuscripts

3. When LLMs step into the 3D World: A Survey and Meta-Analysis of 3D Tasks via Multi-modal Large Language Models. Xianzheng Ma*, *Yash Bhalgat**, Brandon Smart*, Shuai Chen, Xinghui Li, et. al. [arXiv:2405.10255] [Project page]
2. Learned Threshold Pruning. Kambiz Azarian, *Yash Bhalgat*, Jinwon Lee, Tijmen Blankevoort. [arXiv:2003.00075]
1. Quantization-aware Knowledge Distillation. *Yash Bhalgat**, Jangho Kim*, J. Lee, C. Patel, N. Kwak. [arXiv:1911.12491]

PATENTS

6 patents in Computer Vision, Machine (Deep) Learning and Edge Computing.

Patent IDs: *US 17/653,855*; *US 17/175,487*; *US 17/336,048*; *US 17/168,101*; *US 17/067,233*; *US 16/451,693*;

INTERNSHIPS & SELECTED PROJECTS

- [Project] **NeurIPS '19 MicroNet challenge - 3rd place, ImageNet track** [Code] [Jul '19 - Oct '19]
- Designed fast evolutionary mixed precision quantization: 8x compression EfficientNet-B0/MixNet-S, <1% accuracy loss
- [Internship] **IBM Almaden Research Center**, Mentor - *Zhe Liu, Pritam Gundecha* [Summer '18]
- Proposed teacher-student learning paradigm for task-agnostic classification in presence of label noise in train data [Paper]
- [Internship] **IFP Energies nouvelles, Paris**, Mentor - *Laurent Duval* [Summer '17]
- Real-time sparsity-based deformation-invariant feature extraction for large geophysical images (ICASSP 2018) [Paper]
- [Thesis] **Scattering Wavelet Network based Robust Fingerprint Classification** [Jul '16 - Apr '17]
- Guide: *Prof. Vikram Gadre*. Awarded Undergraduate Research Award (URA02) for this work.
- [Internship] **IBM Research, Bangalore**, Mentor - *Vikas Raykar* [Summer '16]
- Joint multi-modal representations for e-commerce catalog search by visual attributes *without* manual tagging

SKILLS

Languages Python (proficient), C++ (moderate), Julia, MATLAB, Verilog, Bash, L^AT_EX

Frameworks PyTorch (proficient), CUDA, LangChain, DSPy, 🤖 Diffusers, TensorFlow & Keras (basic), git, slurm

TEACHING EXPERIENCE

University of Oxford , <i>Teaching Assistant</i>	Computer Vision, w/ <i>Profs Andrea Vedaldi, Andrew Zisserman</i>	[Hillary '22, '24, '25]
	Computer Graphics, with <i>Dr. Jassim Happa, Stuart Golodetz</i>	[Hillary '22]
	Artificial Intelligence, with <i>Prof. Bernardo Cuenca Grau</i>	[Hillary '22]
University of Michigan , <i>Graduate Student Instructor</i>	Computational Data Science, with <i>Prof. Raj Nadakuditi</i>	[Fall '18]
	Introduction to Logic Design, with <i>Prof. Matthew Smith</i>	[Winter '18]
IIT Bombay , <i>Teaching Assistant</i>	Wavelets, with <i>Prof. Vikram Gadre</i>	[Fall '16, Winter '17]
	Quantum Mechanics and Applications, with <i>Prof. Siva Prasad</i>	[Fall '14, Winter '15]

PROFESSIONAL SERVICE

Workshop Organizer: Learning 3D with Multi-View Supervision, CVPR '24; 3D-VLM/VLA Workshop, CVPR '25

Reviewer: ICCV '25, CVPR '24 '23, ECCV '24 '22, ICLR '23, NeurIPS '23, EMNLP '22, '21, TMLR

Area Chair: AI for Content Creation Workshop, CVPR '24. **Website Chair:** BMVC 2022.

SCHOLASTIC ACHIEVEMENTS

- Undergraduate Research Award (URA 02) for exceptional work during Bachelors Thesis at IIT Bombay
- Cargill Global Scholarship 2014-15 and 2015-16 for excellence in leadership and academic skills
- All India Rank **12** in IITJEE-Mains exam among 1 million candidates
- All India Rank **155** in IITJEE-Advanced exam among 150,000 candidates
- All India Rank **60** in KVPY Scholarship exam by Govt. of India among 0.2 million candidates
- Selected among National Top 30 (for OCSC camp) for International Astronomy Olympiad '13
- Selected among top 300 participants of India to compete in **all three national olympiads**: INPhO (Indian National Physics Olympiad), INChO (Chemistry), INAO (Astronomy)
- Visharad Degree (*equivalent to Bachelors in Music*) in Indian Classical Music for playing Tabla