Yash Sanjay Bhalgat

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EDUCATION

University of Oxford — Oct '21 - Oct '25 (Expected)
DPhil (PhD), 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 generative foundation models for photorealistic 3D/4D reconstruction from large-scale heterogeneous data.

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*) — * equal contribution

11. 3D-Aware Instance Segmentation and Tracking in Egocentric Videos. [Paper]
    ACCV, 2024. *Yash Bhalgat**, Vadim Tschernezki*, Iro Laina, João Henriques, Andrea Vedaldi, Andrew Zisserman.

10. N2F2: Hierarchical Scene Understanding with Nested Neural Feature Fields. [Paper]
    ECCV, 2024. *Yash Bhalgat*, Iro Laina, João Henriques, Andrew Zisserman, Andrea Vedaldi.

9. 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.

8. 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.

7. 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.

6. A Light Touch Approach to Teaching Transformers Multi-view Geometry. [Paper]
   CVPR, 2023. *Yash Bhalgat*, João Henriques, Andrew Zisserman.

5. A Prompt Array Keeps the Bias Away: Debiasing Vision-Language Models with Adversarial Learning. [Paper]
   AACL-IJCNLP, 2022. Hugo Berg, Siobhan Hall, *Yash Bhalgat*, Wonsuk Yang, Hannah Kirk, A. Shtedritski, M. Bain.

4. Dynamic Iterative Refinement for Efficient 3D Hand Pose Estimation. [Paper]
   WACV, 2022. John Yang, *Yash Bhalgat*, Simyung Chang, Fatih Porikli, Nojun Kwak.

3. Structured Convolutions for Efficient Neural Network Design. [Paper]
   NeurIPS, 2020. *Yash Bhalgat*, Yizhe Zhang, Jamie Lin, Fatih Porikli.

2. 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.

1. 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, LaTeX
Frameworks	PyTorch (proficient), CUDA, LangChain, DSPy, 🤗 Diffusers, TensorFlow & Keras (basic), git, slurm

TEACHING EXPERIENCE

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