# Yash Sanjay Bhalgat

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## EDUCATION

**University of Oxford** <span style="float:right">Oct '21 - Oct '25 (Expected)</span>

*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** <span style="float:right">Sep '17 - Dec '18</span>

*Masters*, Computer Science and Engineering

**Indian Institute of Technology, Bombay** <span style="float:right">Jul '13 - May '17</span>

*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* <span style="float:right">[Apr '25 - Ongoing]</span>

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

**Multiple startups**, *Part-time AI Consultant* <span style="float:right">[Feb '23 - Mar '25]</span>

- *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* <span style="float:right">[Nov '20 - Jul '21]</span>
          | *Machine Learning Researcher* <span style="float:right">[Jun '19 - Oct '20]</span>

- 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* <span style="float:right">[Feb '19 - May '19]</span>

- 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*) <span style="float:right">* equal contribution</span>

11. Reflecting Reality: Enabling Diffusion Models to Produce Faithful Mirror Reflections. [Paper] [Code] [Dataset]
    **3DV**, 2025. A. Dhiman*, M. Shah*, R. Parihar, *Yash Bhalgat*, L. Boregowda, R Venkatesh Babu.

10. GS-CPR: Efficient Camera Pose Refinement via 3D Gaussian Splatting. [Paper] [Code]
    **ICLR**, 2025. C. Liu, S. Chen, *Yash Bhalgat*, S. Hu, M. Cheng, Z. Wang, V. Prisacariu, T. Braud.

9. 3D-Aware Instance Segmentation and Tracking in Egocentric Videos. [Paper]
   **ACCV**, 2024. *Yash Bhalgat*\*, Vadim Tschernezki\*, Iro Laina, João Henriques, Andrea Vedaldi, Andrew Zisserman.

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

7. 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.

6. 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.

5. 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.

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

3. 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.

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

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

**Preprints & Other Publications**

7. When LLMs step into the 3D World: A Survey and Meta-Analysis of 3D Tasks via Multi-modal Large Language Models. X. Ma*, *Yash Bhalgat*\*, B. Smart*, S. Chen, X. Li, *et. al.* [arXiv:2405.10255] [Github] (*under review at **TPAMI***)

6. Do 3D Large Language Models Really Understand 3D Spatial Relationships? X. Ma, T. Sun, S. Chen, *Yash Bhalgat*, J. Gu, A. Chang, I. Armeni, I. Laina, S. Peng, V. Prisacariu (*under review at **NeurIPS**, 2025*)

5. Learned Threshold Pruning. Kambiz Azarian, *Yash Bhalgat*, Jinwon Lee, Tijmen Blankevoort. [arXiv:2003.00075]

4. LSQ+: Improving low-bit quantization through learnable offsets & better initialization. [Paper]
   **CVPRW** *Efficient Deep Learning in Computer Vision, 2020. Yash Bhalgat*, J. Lee, M. Nagel, T. Blankevoort, N. Kwak.

3. Quantization-aware Knowledge Distillation. *Yash Bhalgat*\*, Jangho Kim*, J. Lee, C. Patel, N. Kwak [arXiv:1911.12491]

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.

## SELECTED INTERNSHIPS & 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

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| **Languages** | Python (proficient), C++ (moderate), Julia, MATLAB, Verilog, Bash, LaTeX |
| **Frameworks** | PyTorch (proficient), CUDA, LangChain, DSPy, 🤗 Diffusers, TensorFlow & Keras (basic), git, slurm |

## TEACHING EXPERIENCE

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| **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