

# 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: Andrew Zisserman, Andrea Vedaldi, João Henriques, 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 and *Minor* in Computer Science

## WORK EXPERIENCE

- Multiple startups, Part-time AI Consultant** [Feb '23 - Mar '24]  
  - 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.
- 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

## 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<sup>A</sup>T<sub>E</sub>X

**Frameworks** PyTorch (proficient), TensorFlow and Keras (basic), OpenAI gym, CUDA, Theano, OpenCV, git, slurm

## TEACHING EXPERIENCE

<b>University of Oxford,</b> <i>Tutor</i>	Computer Vision, <i>with Profs Andrea Vedaldi, Andrew Zisserman</i>	[Hillary '22]
	Computer Graphics, <i>with Dr. Jassim Happa, Stuart Golodetz</i>	[Hillary '22]
	Artificial Intelligence, <i>with Prof. Bernardo Cuenca Grau</i>	[Hillary '22]
<b>University of Michigan,</b> <i>Graduate Student Instructor</i>	Computational Data Science, <i>with Prof. Raj Nadakuditi</i>	[Fall '18]
	Introduction to Logic Design, <i>with Prof. Matthew Smith</i>	[Winter '18]
<b>IIT Bombay,</b> <i>Teaching Assistant</i>	Wavelets, <i>with Prof. Vikram Gadre</i>	[Fall '16, Winter '17]
	Quantum Mechanics and Applications, <i>with 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:** 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 1,000,000 candidates
- All India Rank **155** in IITJEE-Advanced exam among 150,000 candidates
- All India Rank **60** in KVPY Scholarship 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 (*equiv.* Bachelors in Music) in Indian Classical Music for playing Tabla