

Harkirat Behl

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EMPLOYMENT	Microsoft Research <i>Senior Researcher</i>	Redmond, US 2022 -
EDUCATION	University of Oxford Ph.D. Advisors: Philip Torr and Pawan Kumar (Tencent scholarship, Result: no corrections)	Oxford, UK 2021
	Indian Institute of Technology (IIT) Kanpur B.Tech (APM scholarship, Dean's List)	Kanpur, India 2018
PUBLICITY IN MAJOR MEDIA	<ul style="list-style-type: none">• Wall Street Journal, For AI Giants, Smaller Is Sometimes Better• Wired, Pocket-Sized AI Models Could Unlock a New Era of Computing• New York Times, Microsoft Makes a New Push Into Smaller A.I. Systems• Meet the Creator of Microsoft Phi-2• Scientific American, When It Comes to AI Models, Bigger Isn't Always Better	July 2024 May 2024 April 2024 Feb 2024 Nov 2023
INVITED TALKS	The Small Language Models Revolution <ul style="list-style-type: none">• Microsoft Reverb (offsite of 100 Partner+ level Microsoft leaders, held once a year)• Microsoft IC3-AI Tech Talk• HMG (UK Government) Tech Intelligence team• Microsoft AI Compilers Workshop• Github, AI for Code Reading Group• Microsoft PoAA (Pals of Autonomous Agents) Phi-2: The surprising power of small language models <ul style="list-style-type: none">• JEM council meeting (Microsoft E+D research leaders meeting)• Perception Cloud team, Zurich Phi-bonacci: AI Math Tutor <ul style="list-style-type: none">• Microsoft AI Frontiers Offsite• Bill & Melinda Gates Foundation Representatives Robust and Reliable Computer Vision <ul style="list-style-type: none">• Microsoft Research Redmond Meta Learning for Scene Understanding <ul style="list-style-type: none">• Machine Learning for Autonomous Driving Workshop, NeurIPS 2019• Robotic Vision Summer School, Australia	Sep. 2024 Sep. 2024 June 2024 May 2024 May 2024 May 2024 Apr. 2024 Mar. 2024 Jan. 2024 Dec. 2023 Aug. 2021 Dec. 2019 Feb. 2019
PREPRINTS (#): alphabetical ordering	4. Phi-3: A Highly Capable Language Model Locally on Your Phone (#) Marah Abdin, Sam Ade Jacobs, Ammar Ahmad Awan, Jyoti Aneja, Ahmed Awadallah, Hany Awadalla, Nguyen Bach, Amit Bahree, Arash Bakhtiari, Harkirat Behl , Alon Benhaim, Misha Bilenko, Johan Bjorck, Sebastien Bubeck, ... arXiv 2024	
	3. Phi-2: The surprising power of small language models (#) Marah Abdin, Jyoti Aneja, Sebastien Bubeck, Caio Cesar Teodoro Mendes, Weizhu Chen, Allie Del Giorno, Ronen Eldan, Sivakanth Gopi, Suriya Gunasekar, Mojan Javaheripi, Piero Kauffmann, Yin Tat Lee, Yuanzhi Li, Anh Nguyen, Gustavo de Rosa, Olli Saarikivi, Adil Salim, Shital Shah, Michael Santacrose, Harkirat Singh Behl , Adam Taumann Kalai, Xin Wang, Rachel Ward, Philipp Witte, Cyril Zhang, Yi Zhang Microsoft Research Blog 2023	

2. Textbooks are all You Need
(#) Suriya Gunasekar, Yi Zhang, Jyoti Aneja, Caio Cesar Teodoro Mendes, Allie Del Giorno, Sivakanth Gopi, Mojan Javaheripi, Piero Kauffmann, Gustavo de Rosa, Olli Saarikivi, Adil Salim, Shital Shah, [Harkirat Singh Behl](#), Xin Wang, Sebastien Bubeck, Ronen Eldan, Adam Tauman Kalai, Yin Tat Lee, Yuanzhi Li
arXiv 2023
1. Unlocking Spatial Comprehension in Text-to-Image Diffusion Models
Mohammad Mahdi Derakhshani, Menglin Xia, [Harkirat Behl](#), Cees GM Snoek, Victor Rhle
arXiv 2023

PUBLICATIONS

14. Peekaboo: Interactive Video Generation via Masked-Diffusion
Yash Jain, Anshul Nasery, Vibhav Vineet, [Harkirat Behl](#)
CVPR 2024
13. Scaling the Convex Barrier with Sparse Dual Solvers
Alessandro De Palma, [Harkirat Singh Behl](#), Rudy Bunel, Philip Torr, M. Pawan Kumar
JMLR 2024
12. Dataset-aware Mixture-of-Experts
Yash Jain, [Harkirat Behl](#), Zsolt Kira, Vibhav Vineet
NeurIPS 2023
11. Efficiently Robustify Pre-Trained Models
Nishant Jain, [Harkirat Behl](#), Yogesh Rawat, Vibhav Vineet
ICCV 2023
10. X-Decoder: Generalized Decoding for Pixel, Image and Language
Xueyan Zou* , Zi-Yi Dou*, Jianwei Yang*, Zhe Gan, Linjie Li, Chunyuan Li, Xiyang Dai, [Harkirat Behl](#), Jianfeng Wang, Lu Yuan, Nanyun Peng, Lijuan Wang, Yong Jae Lee, Jianfeng Gao
CVPR 2023
9. Neural-Sim: Learning to Generate Training Data with NeRF
Yunhao Ge, [Harkirat Behl](#), Jiashu Xu, Suriya Gunasekar, Neel Joshi, Yale Song, Xin Wang, Laurent Itti, and Vibhav Vineet
ECCV 2022
8. Overcoming the Convex Barrier for Simplex Inputs
[Harkirat Singh](#), M. Pawan Kumar, Philip Torr, Krishnamurthy (Dj) Dvijotham
NeurIPS 2021
7. Scaling the Convex Barrier with Active Sets
[Harkirat Singh Behl*](#), Alessandro De Palma*, Rudy Bunel, Philip Torr, M. Pawan Kumar
ICLR 2021
6. Progressive Skeletonization: Trimming more fat from a network at initialization
Pau Jorge, Amartya Sanyal, [Harkirat Singh Behl](#), Philip Torr, Gregory Rogez, Puneet Dokania
ICLR 2021
5. STEER: Simple Temporal Regularization for Neural ODEs
Arnab Ghosh, [Harkirat Singh Behl](#), Philip Torr, Vinay Namboodiri
NeurIPS 2020
4. AutoSimulate: (Quickly) Learning Synthetic Data Generation
[Harkirat Singh Behl](#), Atilim Gunes Baydin, Ran Gal, Philip Torr, Vibhav Vineet
ECCV 2020
3. Meta Learning Deep Visual Words for Fast Video Object Segmentation
[Harkirat Singh Behl](#), Mohammad Najafi, Anurag Arnab, Philip Torr
IROS 2020 (Oral)
NeurIPS 2019 ML4AD Workshop (Oral)
2. Alpha MAML: Adaptive Model-Agnostic Meta-Learning
[Harkirat Singh Behl](#), Atilim Gunes Baydin, Philip Torr
ICML 2019 Workshop
1. Incremental Tube Construction for Human Action Detection
[Harkirat Singh Behl](#), Michael Sapienza, Gurbir Singh, Suman Saha, Fabio Cuzolin, Philip Torr
BMVC 2018

ACADEMIC SERVICE	Reviewer	
	Reviewed over 50 conference papers in top tier AI conferences	
	<ul style="list-style-type: none"> • Vision Conferences: CVPR, ICCV, ECCV • ML Conferences: NeurIPS, ICML, ICLR, AAAI, AISTATS (intermittently) • Graphics Conferences : SIGGRAPH, SIGGRAPH-Asia • Journals : IJCV, T-PAMI • Workshops (intermittently): NeurIPS, ICML and vision workshops 	<p>2021-present</p> <p>2021-present</p> <p>2021-present</p> <p>2021-present</p> <p>2019-present</p>
	PhD thesis Examiner	
	<ul style="list-style-type: none"> • Understanding Multimodal Representation Learning via Latent Variable Models Ravindra Yadav, Indian Institute of Technology Kanpur 	<p>2022</p>
MENTORING	<ul style="list-style-type: none"> • Behrooz Tahmasebi (MIT) • Mohammad Derakhshani (University of Amsterdam) • Yash Jain (Georgia Tech) → (Applied Scientist, Microsoft) • Jiashu Xu (Harvard University) → (Research Scientist, Nvidia) • Robbie Netzorg (UC Berkeley) • Nishant Jain (IIT Roorkee) → (Research Associate, Google Deepmind) • Yunhao (Andy) Ge (University of Southern California) → (Research Scientist, Nvidia) 	<p>2024</p> <p>2023</p> <p>2023</p> <p>2023</p> <p>2022</p> <p>2022</p> <p>2021</p>
TEACHING EXPERIENCE	<ul style="list-style-type: none"> • Tutor, Information Engineering Systems (Estimation, Inference, Image Processing, Signal Analysis), Oxford • Lab Demonstrator, Optimization Methods for Engineering Computation, Oxford • Lab Demonstrator, Image and Signal Analysis, Oxford • Senior Academic Mentor, Statistical Thermodynamics, C Programming, Numerical Computation Methods, IIT Kanpur • Academic Mentor, Essentials of Programming, IIT Kanpur 	<p>2020-21</p> <p>2019-20</p> <p>2019-20</p> <p>2015-16</p> <p>2014-15</p>
POSITIONS OF RESPONSIBILITY	<ul style="list-style-type: none"> • Junior Advisor, St Cross College, Oxford • Communities Representative, St Cross College, Oxford • Secretary, University of Oxford Sikh Society, Oxford • Academic core team member, Counselling Service, IIT Kanpur • Member, AUV team (Autonomous Underwater Vehicle), IIT Kanpur • Mentor, Robotics Club, IIT Kanpur • Senior Executive Finance, Techkriti'15, IIT Kanpur • Student Guide, Counselling Service, IIT Kanpur 	<p>2019-21</p> <p>2019-20</p> <p>2019-20</p> <p>2015-16</p> <p>2014-16</p> <p>2015-16</p> <p>2014-15</p> <p>2014-15</p>
SPORTS	<ul style="list-style-type: none"> • Captain, Wolfson and St Cross College Cricket team, Oxford • Member, OUCCC team (Oxford University Club Cricket Club), Oxford • Member, Table Tennis team for Udghosh sports tournament, IIT Kanpur • Member of runner-up team, Intramural Basketball championship, IIT Kanpur 	<p>2019-21</p> <p>2018-21</p> <p>2015</p> <p>2014</p>
REFERENCES	<ul style="list-style-type: none"> • Prof. Philip H.S. Torr, phst@robots.ox.ac.uk Professor, University of Oxford Fellow of Royal Society, Fellow of Royal Academy of Engineering • Sebastien Bubeck, sebubeck@microsoft.com Vice President and Distinguished Scientist, Microsoft Research • M. Pawan Kumar, mpawan@deepmind.com Google DeepMind, Previously Associate Professor, University of Oxford • Prof. Yin Tat Lee, yintat@uw.edu Associate Professor, University of Washington Senior Principal Research Manager, Microsoft Research 	