Dinesh Jayaraman

Assistant Professor of Computer and Information Science, University of Pennsylvania

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Education

Last updated: June 20, 2021

Aug 2011 - Aug 2017	Doctor of Philosophy Electrical and Computer Engineering, **UT Austin**
Aug 2007 - Jun 2011	Bachelor of Technology Electrical Engineering, **IIT Madras**, India.

Positions Held

Jan 2020 - now	*Assistant Professor at Department of Computer and Information Science (CIS),* **University of Pennsylvania**
Aug 2019 - Dec 2019	*Visiting Research Scientist at Facebook Artificial Intelligence Research,* **Facebook**
Sep 2017 - Aug 2019	*Postdoctoral Scholar at Berkeley Artificial Intelligence Research Laboratory,* **UC Berkeley**
Jan 2013 - Aug 2017	*Research Assistant at Computer Vision Laboratory,* **UT Austin**
Jul 2014 - Sep 2014	*Visiting student researcher,* **UC Berkeley**
Jun 2012 - Aug 2012	*Research internship at* **Intel Labs**, *Santa Clara*
Aug 2011 -Dec 2012	*Research Assistant at Laboratory for Image and Video Engineering,* **UT Austin**
May 2010 - Jul 2010	*Research internship at* **Marvell Semiconductors**, *Bangalore*

Academic honors and Awards

Feb 2021	Selected for the AAAI New Faculty Highlights Program.
May 2019	2018 Best Paper Award Runner-Up, IEEE Robotics and Automation-Letters (RA-L).
May 2019	Work Featured on Cover Page of Science Robotics Issue.
Oct 2017	University Nominee for ACM Best Dissertation Award, UT Austin 2017.
Nov 2016	Best Application Paper Award at ACCV 2016, Taipei.
Jul 2016	Graduate Dean's Prestigious Fellowship Supplement, UT Austin, 2016-17.
Jun 2016	Outstanding Reviewer Award at CVPR 2016, Las Vegas, Nevada.
Apr 2016	Samsung PhD Fellowship, 2016-17.
Mar 2016	Invited paper for IJCV Special Issue of Best Papers from ICCV 2015.
Oct 2014	NVIDIA Academic grant award, 2014.
Aug 2011	Microelectronics and Computer Development Fellowship, UT Austin, 2011-12.
May 2011	Dr. Dilip Veeraraghavan Memorial Award, IIT Madras, 2011.
May 2011	K. Srinivasan and Indira Srinivasan Prize, IIT Madras, 2011.
May 2009	Rajalakshmi Krishnamurthy English Prize, IIT Madras, 2011.
Mar 2009	OPJEMS National Award for academic and leadership excellence, O.P. Jindal group, 2009-10.
Feb 2009	Winning team member, Robocon India robotics competition, 2009.

May 2008	Certificate of Merit, Dept. of Electrical Engineering, IIT Madras.
May 2007	First rank in Tamil Nadu state, and 36th in India, AIEEE 2007.
Jun 2007	All India Rank 161 in IIT-JEE 2007.
Feb 2006	KVPY Fellowship, Tata Institute of Fundamental Research and Indian Institute of Science, 2006.
Mar 2005	NTSE scholarship, NCERT, Ministry of Education, Govt. of India, 2005.

Book Chapters

- **Dinesh Jayaraman**, Chao-Yeh Chen, Fei Sha, and Kristen Grauman. Divide, share, and conquer: Multi-task attribute learning with selective sharing. In *Visual attributes*, pages 49–85. Springer, Cham, 2017

Journal Publications

- Santhosh K Ramakrishnan, **Dinesh Jayaraman**, and Kristen Grauman. An exploration of embodied visual exploration. *IJCV*, 2021
- Mike Lambeta, Po-Wei Chou, Stephen Tian, Brian Yang, Benjamin Maloon, Victoria Rose Most, Dave Stroud, Raymond Santos, Ahmad Byagowi, Gregg Kammerer, **Dinesh Jayaraman**, and Roberto Calandra. Digit: A novel design for a low-cost compact high-resolution tactile sensor with application to in-hand manipulation. *ICRA and IEEE RA-L*, 2020
- Brian Yang*, **Dinesh Jayaraman***, Glen Berseth, Alexei Efros, and Sergey Levine. MAVRIC: Morphology-agnostic visual robotic control. *ICRA and IEEE RA-L*, 2020
- Santhosh K Ramakrishnan*, **Dinesh Jayaraman***, and Kristen Grauman. Emergence of exploratory look-around behaviors through active observation completion. *Science Robotics*, 2019
- Roberto Calandra, Andrew Owens, **Dinesh Jayaraman**, Justin Lin, Wenzhen Yuan, Jitendra Malik, Edward H Adelson, and Sergey Levine. More than a feeling: Learning to grasp and regrasp using vision and touch. *IROS and IEEE RA-L*, 2018 (Best Paper Award Runner-Up)
- **Dinesh Jayaraman** and Kristen Grauman. End-to-end policy learning for active visual categorization. *IEEE TPAMI*, 2018
- **Dinesh Jayaraman** and Kristen Grauman. Learning image representations tied to egomotion from unlabeled video. *IJCV Special Issue of Best Papers from ICCV 2015*, 2017

Peer-reviewed Conference Publications

- Chuan Wen, Jierui Lin, Jianing Qian, Yang Gao, and **Dinesh Jayaraman**. Keyframe-focused visual imitation learning. *ICML*, 2021
- Jingxi Xu, Bruce Lee, Nikolai Matni, and **Dinesh Jayaraman**. How are learned perception-based controllers impacted by the limits of robust control? *L4DC*, 2021
- Glen Berseth, Daniel Geng, Coline Devin, Chelsea Finn, **Dinesh Jayaraman**, and Sergey Levine. SMiRL: Surprise minimizing rl in dynamic environments. *ICLR*, 2021 (Oral Presentation)
- Neha Das, Sarah Bechtle, Todor Davchev, **Dinesh Jayaraman**, Akshara Rai, and Franziska Meier. Model-based inverse reinforcement learning from visual demonstrations. *CORL*, 2020
- Karl Pertsch, Oleh Rybkin, Frederik Ebert, **Dinesh Jayaraman**, Chelsea Finn, and Sergey Levine. Long-horizon visual planning with goal-conditioned hierarchical predictors. *NeurIPS*, 2020
- Chuan Wen, Jierui Lin, Trevor Darrell, **Dinesh Jayaraman**, and Yang Gao. Fighting copycat agents in behavioral cloning from observation histories. *NeurIPS*, 2020
- Jesse Zhang, Brian Cheung, Chelsea Finn, Sergey Levine, and **Dinesh Jayaraman**. Cautious adaptation for reinforcement learning in safety-critical settings. *ICML*, 2020
- Mike Lambeta, Po-Wei Chou, Stephen Tian, Brian Yang, Benjamin Maloon, Victoria Rose Most, Dave Stroud, Raymond Santos, Ahmad Byagowi, Gregg Kammerer, **Dinesh Jayaraman**, and Roberto Calandra. Digit: A novel

design for a low-cost compact high-resolution tactile sensor with application to in-hand manipulation. *ICRA and IEEE RA-L*, 2020

- Brian Yang*, **Dinesh Jayaraman***, Glen Berseth, Alexei Efros, and Sergey Levine. MAVRIC: Morphology-agnostic visual robotic control. *ICRA and IEEE RA-L*, 2020
- Pim de Haan, **Dinesh Jayaraman**, and Sergey Levine. Causal confusion in imitation learning. *NeurIPS*, 2019
- Brian Yang, **Dinesh Jayaraman**, Jesse Zhang, and Sergey Levine. Replab: A reproducible low-cost arm benchmark for robotic learning. *ICRA*, 2019
- Stephen Tian, Frederik Ebert, **Dinesh Jayaraman**, Mayur Mudigonda, Chelsea Finn, Roberto Calandra, and Sergey Levine. Manipulation by feel: Touch-based control with deep predictive models. *ICRA*, 2019
- **Dinesh Jayaraman**, Frederik Ebert, Alexei A Efros, and Sergey Levine. Time-agnostic prediction: Predicting predictable video frames. *ICLR*, 2019
- **Dinesh Jayaraman**, Ruohan Gao, and Kristen Grauman. Shapecodes: self-supervised feature learning by lifting views to viewgrids. *ECCV*, 2018
- Roberto Calandra, Andrew Owens, **Dinesh Jayaraman**, Justin Lin, Wenzhen Yuan, Jitendra Malik, Edward H Adelson, and Sergey Levine. More than a feeling: Learning to grasp and regrasp using vision and touch. *IROS and IEEE RA-L*, 2018
- **Dinesh Jayaraman** and Kristen Grauman. Learning to look around: Intelligently exploring unseen environments for unknown tasks. *CVPR*, 2018
- Yu-Chuan Su, **Dinesh Jayaraman**, and Kristen Grauman. Pano2vid: Automatic cinematography for watching 360-degree videos. *ACCV*, 2016
- Ruohan Gao, **Dinesh Jayaraman**, and Kristen Grauman. Object-centric representation learning from unlabeled videos. *ACCV*, 2016
- **Dinesh Jayaraman** and Kristen Grauman. Look-ahead before you leap: end-to-end active recognition by forecasting the effect of motion. *ECCV*, 2016 (Oral Presentation)
- **Dinesh Jayaraman** and Kristen Grauman. Slow and steady feature analysis: higher order temporal coherence in video. *CVPR*, 2016 (Oral Spotlight Presentation)
- **Dinesh Jayaraman** and Kristen Grauman. Learning image representations tied to ego-motion. *ICCV*, 2015 (Oral Presentation)
- **Dinesh Jayaraman** and Kristen Grauman. Zero-shot recognition with unreliable attributes. *NeurIPS*, 2014
- **Dinesh Jayaraman**, Fei Sha, and Kristen Grauman. Decorrelating semantic visual attributes by resisting the urge to share. *CVPR*, 2014
- **Dinesh Jayaraman**, Anish Mittal, Anush K Moorthy, and Alan C Bovik. Objective quality assessment of multiply distorted images. *ASILOMAR Signals, Systems and Computers*, 2012

Preprints and Technical Reports

- Yecheng Jason Ma, Jeevana Priya Inala, **Dinesh Jayaraman**, and Osbert Bastani. Diverse sampling for normalizing flow based trajectory forecasting. *arXiv preprint arXiv:2011.15084*, 2020
- Hui Chen, Zhao Li, Sheng Feng, Anni Wang, Melissa Richard-Greenblatt, Emily Hutson, Stefen Andrianus, Laurel J. Glaser, Kyle G. Rodino, Jianing Qian, **Dinesh Jayaraman**, Ronald G. Collman, Abigail Glascock, Frederic D. Bushman, Jae Seung Lee, Sara Cherry, Alejandra Fausto, Susan R. Weiss, Hyun Koo, Patricia M. Corby, Una O'Doherty, Alfred L. Garfall, Dan T. Vogl, Edward A. Stadtmauer, and Ping Wang. Femtomolar sars-cov-2 antigen detection using the microbubbling digital assay with smartphone readout enables antigen burden quantitation and dynamics tracking. Cold Spring Harbor Laboratory Press, 2021 Tracking", medRxiv 2021

Patents

- Dinesh Jayaraman, Oscar Nestares, and Kalpana Seshadrinathan. "Techniques for improved focusing of camera arrays." U.S. Patent 9,743,016, issued August 22, 2017.
- Dinesh Jayaraman, Tao Ma, Wei Sun, Oscar Nestares, and Kalpana Seshadrinathan. "Techniques for rectification of camera arrays." U.S. Patent 9,875,543, issued January 23, 2018.

Theses

- Dinesh Jayaraman, "Embodied Learning for Visual Recognition". PhD Thesis. Supervisor: Prof. Kristen Grauman, UT Austin, 2017.
- Dinesh Jayaraman, "Modeling Natural and Distorted Image Statistics". Bachelors Thesis. Supervisor: Prof. R. Aravind, IIT Madras, 2011.

Wider Press and Technical Blog Coverage

- NSF.gov: "NSF advances artificial intelligence research with new nationwide institutes", https://www.nsf.gov/news/special_reports/announcements/082620.jsp, (Aug 26, 2020).
- TechXplore: "DIGIT: A high-resolution tactile sensor to enhance robot in-hand manipulation skills." https://techxplore.com/news/2020-07-digit-high-resolution-tactile-sensor-robot.html, July 2020.
- FreeNews: "Scientists have made a high-resolution tactile sensor: the robot will work more efficiently." https://freenews.live/scientists-have-made-a-high-resolution-tactile-sensor-the-robot-will-work-more July 2020.
- VentureBeat: "Facebook's Digit is a low-cost tactile sensor for robotic hands." https://venturebeat.com/2020/06/01/facebooks-digit-is-a-low-cost-tactile-sensor-for-robotic-hands/, June 2020.
- NVIDIA developer news center: "NVAIL Partners present AI Research at ICLR." https://news.developer.nvidia.com/nvail-partners-present-ai-research-at-iclr/, May 2020.
- TechXplore: "REPLAB: a low-cost benchmark platform for robotic learning." https://techxplore.com/news/2019-05-replab-low-cost-benchmark-platform-robotic.html
- Science Daily: "New AI sees like a human, filling in the blanks". https://www.sciencedaily.com/releases/2019/05/190515144017.htm. May 2019.
- Psychology Today: "Scientists Create Human-like AI Computer Vision". https://www.psychologytoday.com/us/blog/the-future-brain/201905/scientists-create-human-ai-computer-vision, (May 29, 2019).
- Science Robotics Front Page: "Developing a good eye".https://robotics.sciencemag.org/content/4/30, May 2019.
- Interesting Engineering, "New Artificial Intelligence Sees Like a Human, Bringing Us Closer to Skynet". May 2019. https://interestingengineering.com/new-artificial-intelligence-sees-like-a-human-bringing-us-clo
- UT Austin News: "New AI Sees Like a Human, Filling in the Blanks", https://news.utexas.edu/2019/05/15/new-ai-sees-like-a-human-filling-in-the-blanks/, May 2019.

Professional Service

Organizer:

- Workshop on Embodied Multimodal Learning, ICLR '21
- Workshop on Visual Learning and Reasoning for Robotics, RSS '20, '21
- Workshop on Benchmarking in Robotics, Pittsburgh, August '19
- Workshop on Action and Anticipation for Visual Learning, ECCV '16

Proposal Review Panel:

- National Science Foundation Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) Program Review Panel, '20.
- National Science Foundation Robust Intelligence Small and Medium Proposals Review Panel, '20
- Hong Kong University Grants Commission Review Panel, '20
- Envision Women in STEM Proposal Competition Review Panel, '21

Area Chair:

- International Conference on Learning Representations (ICLR), '21.
- Neural and Information Processing Systems (NeurIPS), '18, '19, '20, '21.

- Association for the Advancement of Artificial Intelligence (AAAI) Conference on Artificial Intelligence, '20, '21.

Associate Editor:

- International Conference on Robotics and Automation (ICRA) '20, '21.

Session Chair:

- International Conference on Learning Representations (ICLR), '21.
- Neural and Information Processing Systems (NeurIPS), '18, '20.

Local Arrangements Chair:

- Koenderink Symposium on the Art and Science of Vision, UC Berkeley, October '18.

Conference Program Committee Member / Reviewer:

- Robotics: Science and Systems (RSS) '18, '21
- Computer Vision and Pattern Recognition (CVPR) '15,'16,'17,'18,'20
- International Conference on Robotics and Automation (ICRA) '18,'19
- Conference on Robot Learning (CORL) '18,'19
- European Conference on Computer Vision (ECCV) '16,'18
- Asian Conference on Computer Vision (ACCV) '16,'18
- International Conference on Computer Vision (ICCV) '15,'17
- International Conference on Image Processing Theory, Tools and Applications (IPTA) '17
- Neural and Information Processing Systems (NeurIPS) '15
- International Conference on Machine Learning (ICML) '15
- Workshop on Egocentric Perception, Interaction and Computing, ICCV '19
- Workshop on Multitask and Lifelong Reinforcement Learning, ICML '19
- Egocentric Vision Workshop at CVPR '16

Journal Reviewer:

- Transactions on Pattern Analysis and Machine Intelligence (TPAMI) '16,'17,'18,'19,'21
- IEEE Robotics and Automation-Letters (RA-L) '18,'19
- Journal of Machine Learning Research (JMLR) '19
- International Journal of Computer Vision (IJCV) '17,'18,'19.
- Machine Vision and Applications (MVAP) '17
- Transactions in Image Processing (TIP) '16

Thesis Committees:

- Georgios Pavlakos, CIS PhD thesis: Learning to Reconstruct 3D Humans, University of Pennsylvania, '20.
- Jyh-Jing Hwang, CIS PhD thesis: Learning Image Segmentation with Relation-Centric Loss and Representation, University of Pennsylvania, '20.
- Wenxin Liu, WPE II Commitee, Uncertainty Estimation for Regression Using Neural Networks, '20.
- Ian Miller, ESE Provisional Doctoral Committee, '21.
- Elijah Lee, WPE II Committee, '21.
- Kyle Vedder, WPE II Committee, '21.
- Tony Liu, WPE II Comittee Chair, '21.

Teaching

- CIS 522 Deep Learning: Reinforcement Learning Module, University of Pennsylvania – Spring '21
- CIS 419/519 Applied Machine Learning, University of Pennsylvania - Spring '20, '21, Fall '21
- CIS 700 Data-Driven Robotic Perception and Control, University of Pennsylvania - Fall '20

Invited and Conference Talks

Feb 2021	AAAI New Faculty Highlight Talk, 35th AAAI Conference on Artificial Intelligence (Virtual), 2021.
Sep 2020	Intelligent Sensing Summer School, Queen Mary University of London, United Kingdom.
Dec 2019	"Causal Confusion in Imitation Learning", Invited Talk at Center for Human-Compatible AI, Berkeley, CA.
Nov 2019	"Understanding Embodied Visual Intelligence", Invited Talk at Samsung Strategy and Innovation Center Forum, San Jose, CA.
Oct 2019	"REPLAB: Challenges and Opportunities of Low-Cost Robots", Invited Tutorial at CORL, Osaka, Japan.
Jul 2019	"Towards Embodied Visual Intelligence", Facebook AI Research, Menlo Park, California, USA.
Jul 2019	"Vision and Action: Visual Approaches to Robotic Control", Invited Talk at the VISUM Summer School on Computer Vision and Machine Learning, Porto, Portugal.
May 2019	"Visual Learning for Tactile Manipulation", Invited Talk at ViTac Workshop on Integrating Vision and Touch for Multimodal and Cross-modal Perception, ICRA 2019, Montreal, Canada.
Jul 2018	"Embodied learning for vision", Invited talk at ICML workshop on "Learning with Limited Labels: Invariance, Equivariance, and Beyond", Stockholm, Sweden.
Mar 2017	"Embodied learning for visual recognition", Robotics Institute, Carnegie Mellon University, Pittsburgh, Pennsylvania, USA.
Feb 2017	"Embodied learning for visual recognition", Computer Science and Artificial Intelligence Laboratory, Massachusetts Institute of Technology, Cambridge, Massachusetts, USA.
Feb 2017	"Embodied learning for visual recognition", Toyota Technological Institute, Chicago, Illinois, USA.
Feb 2017	"Embodied learning for visual recognition", Stanford Computer Vision Lab, Stanford University, Palo Alto, California, USA.
Feb 2017	"Embodied learning for visual recognition", Berkeley Artificial Intelligence Research Laboratory, The University of California at Berkeley, Berkeley, California, USA.
Dec 2016	"Embodied learning for visual recognition", Image Processing and Computer Vision Lab, IIT Madras, Chennai, India.
Oct 2016	"Look-ahead before you leap: end-to-end active recognition by forecasting the effect of motion", Oral presentation at European Conference on Computer Vision (ECCV), Amsterdam, the Netherlands.
Jun 2016	"Slow and steady feature analysis", Oral spotlight presentation at Computer Vision and Pattern Recognition (CVPR), Las Vegas, Nevada, USA.
Dec 2015	"Learning image representations tied to ego-motion", Oral presentation at International Conference on Computer Vision (ICCV), Santiago, Chile.
Dec 2015	"Embodied learning of image representations from video", Image Processing and Computer Vision Lab, IIT Madras, Chennai, India.
Dec 2014	"Zero-shot recognition and cross-view geolocation", Computer Vision group at Cornell Tech, New York City, New York, USA.
Sep 2014	"Zero-shot recognition with unreliable attributes", Computer Vision group at UC Berkeley, Berkeley, California, USA.
Jun 2014	"Decorrelating semantic visual attributes", Oral presentation at Computer Vision and Pattern Recognition (CVPR), Columbus, Ohio, USA.