Dinesh Jayaraman

Education

Last updated: August 26, 2020

Aug 2011 - Aug 2017	Doctor of Philosophy Electrical and Computer Engineering, **UT Austin**
Aug 2011 - Aug 2014	Master of Science Electrical and Computer Engineering, **UT Austin**
Aug 2007 - Jun 2011	Bachelor of Technology Electrical Engineering, **IIT Madras**, India.

Work Experience

Jan 2020 - now	*Tenure-track Assistant Professor at Computer and Information Sciences(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*

Research interests

Computer vision, robotics, and machine learning.

Embodied learning approaches, perception-action cycles, active vision, deep learning, robotic manipulation, tactile sensing, visual feedback for control, unsupervised and self-supervised deep image representation learning, multi-task and transfer learning, semantic visual attributes.

Academic honors and awards

May 2019	2018 Best Paper Award Runner-Up, IEEE Robotics and Automation-Letters (RA-L).
May 2019	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 and Kristen Grauman, "Divide, Share, and Conquer: Multi-Task Attribute Learning With Selective Sharing" (book chapter), Springer book on Visual Attributes (Editors: Rogerio Feris, Devi Parikh, Christoph H. Lampert), 2016.

Journal Publications

- Brian Yang, Mike Maroje Lambeta, Po-Wei Chou, Stephen Tian, Benjamin Maloon, Victoria Rose Most, Dave Stroud, Raymond Santos, Ahmad Byagowi, Gregg Kammerer, **Dinesh Jayaraman**, Roberto Calandra, "DIGIT: A Novel Design for a Low-Cost Compact High-Resolution Tactile Sensor with Application to In-Hand Manipulation", IEEE Robotics and Automation-Letters (RA-L), 2020.
- Brian Yang*, **Dinesh Jayaraman***, Glen Berseth, Alexei Efros, Sergey Levine, "MAVRIC: Morphology-Agnostic Visual Robotic Control", IEEE Robotics and Automation-Letters (RA-L), 2020.
- Santhosh Kumar 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 Adelson, and Sergey Levine, "Learning Interactive Grasping from

Vision and Touch", IEEE Robotics and Automation-Letters (RA-L), 2018 (2018 Best Paper Award Runner-Up).

- **Dinesh Jayaraman** and Kristen Grauman, "End-to-end Policy Learning for Active Visual Categorization", IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI), 2018.
- **Dinesh Jayaraman** and Kristen Grauman, "Learning Egomotion-Tied Image Representations From Unlabeled Video", Invited Paper in IJCV 2017 Special Issue of Best Papers from ICCV 2015.
- Brian Yang, **Dinesh Jayaraman***, Glen Berseth, Alexei Efros, and Sergey Levine, "MAVRIC: Morphology-Agnostic Visual Robotic Control", IEEE Robotics and Automation-Letters (RA-L), 2019.

Peer-reviewed Conference Publications

- Jesse Zhang, Brian Cheung, Chelsea Finn, Sergey Levine, and **Dinesh Jayaraman**, "Cautious Adaptation For Reinforcement Learning in Safety-Critical Settings", International Conference on Machine Learning, 2020.
- Brian Yang, Mike Maroje Lambeta, Po-Wei Chou, Stephen Tian, Benjamin Maloon, Victoria Rose Most, Dave Stroud, Raymond Santos, Ahmad Byagowi, Gregg Kammerer, **Dinesh Jayaraman**, Roberto Calandra, "DIGIT: A Novel Design for a Low-Cost Compact High-Resolution Tactile Sensor with Application to In-Hand Manipulation", International Conference on Robotics and Automation (ICRA), Paris, France, May 2020.
- Brian Yang*, **Dinesh Jayaraman***, Glen Berseth, Alexei Efros, Sergey Levine, "MAVRIC: Morphology-Agnostic Visual Robotic Control", International Conference on Robotics and Automation (ICRA), Paris, France, May 2020.
- Pim de Haan, **Dinesh Jayaraman**, and Sergey Levine, "Causal Confusion in Imitation Learning", Neural and Information Processing Systems (NeurIPS), Vancouver, Canada, December 2019 (oral, 0.5% acceptance rate).
- Brian Yang, **Dinesh Jayaraman**, and Sergey Levine, "REPLAB: A Reproducible Low-Cost Arm Benchmark for Robotic Learning", International Conference on Robotics and Automation (ICRA), Montreal, Canada, May 2019.
- Stephen Tian, Frederik Ebert, **Dinesh Jayaraman**, Roberto Calandra, Mayur Mudigonda, and Sergey Levine, "Manipulation by Feel: Touch-Based Control with Deep Predictive Models", International Conference on Robotics and Automation (ICRA), Montreal, Canada, May 2019.
- **Dinesh Jayaraman**, Frederik Ebert, Alexei A. Efros, and Sergey Levine, "Time-Agnostic Prediction: Predicting Predictable Video Frames", International Conference on Learning Representations (ICLR), New Orleans, LA, USA, May 2019.
- **Dinesh Jayaraman**, Ruohan Gao, and Kristen Grauman, "ShapeCodes: Self-Supervised Feature Learning by Lifting Views to Viewgrids", European Conference on Computer Vision (ECCV), Munich, Germany, September 2018. (24.5% acceptance rate)
- Roberto Calandra, Andrew Owens, **Dinesh Jayaraman**, Justin Lin, Wenzhen Yuan, Jitendra Malik, Edward Adelson, and Sergey Levine, "Learning Interactive Grasping from Vision and Touch", International Conference on Intelligent Robots and Systems (IROS), Madrid, Spain, October 2018. (47% acceptance rate)
- **Dinesh Jayaraman** and Kristen Grauman, "Learning to Look Around: Intelligently Exploring Unseen Environments for Unknown Tasks", Computer Vision and Pattern Recognition (CVPR), Salt Lake City, Utah, USA, June 2018 (poster, 29% acceptance rate).

- Yu-Chuan Su, **Dinesh Jayaraman** and Kristen Grauman, "Pano2Vid: Automatic Cinematography for Watching 360-degree Videos", Asian Conference on Computer Vision (ACCV), Taipei, November 2016 (Best Application Paper Award).
- Ruohan Gao, **Dinesh Jayaraman** and Kristen Grauman, "Object-Centric Representation Learning from Unlabeled Videos", Asian Conference on Computer Vision (ACCV), Taipei, November 2016 (poster, 30% acceptance rate).
- **Dinesh Jayaraman** and Kristen Grauman, "Look-Ahead Before You Leap: Active Vision by Forecasting the Effect of Motion", European Conference on Computer Vision (ECCV), Amsterdam, Netherlands, October 2016 (oral, 1.8% acceptance rate).
- **Dinesh Jayaraman** and Kristen Grauman, "Slow and Steady Feature Analysis: Higher Order Temporal Coherence in Video", Computer Vision and Pattern Recognition (CVPR), Las Vegas, NV, USA, June 2016 (oral spotlight, 9.7% acceptance rate).
- **Dinesh Jayaraman** and Kristen Grauman, "Learning Image Representations Tied to Egomotion", International Conference on Computer Vision (ICCV), Santiago, Chile, Dec 2015 (oral, 3.3% acceptance rate).
- **Dinesh Jayaraman** and Kristen Grauman, "Zero-Shot Recognition with Unreliable Attributes", Neural and Information Processing Systems (NeurIPS), Montreal, Canada, Dec 2014 (poster, 25% acceptance rate).
- **Dinesh Jayaraman**, Fei Sha and Kristen Grauman, "Decorrelating Semantic Visual Attributes by Resisting the Urge to Share", Computer Vision and Pattern Recognition (CVPR), Columbus, USA, June 2014 (oral, 5.75% acceptance rate).
- **Dinesh Jayaraman**, Anish Mittal, Anush Moorthy and Alan Bovik, "Objective Quality Assessment of Multiply Distorted Images", Asilomar Conference on Signals and Systems, Asilomar Conference Grounds, California, USA, October 2012.

Peer-reviewed Workshop Papers and Abstracts

(excluding work that has appeared in peer-reviewed conferences or journals)

- Jesse Zhang, Brian Cheung, Chelsea Finn, Sergey Levine, and **Dinesh Jayaraman**, "Hope For The Best But Prepare For The Worst: Cautious Adaptation In RL Agents", NeurIPS Workshop on Safety and Robustness in Decision Making, 2019 & NeurIPS Workshop on Deep Reinforcement Learning, 2019.
- Glen Berseth, Daniel Geng, Coline Devin, Chelsea Finn, **Dinesh Jayaraman**, and Sergey Levine, "SMiRL: Surprise Minimizing RL in Entropic Environments", NeurIPS Workshop on Deep Reinforcement Learning & NeurIPS Workshop on Biological and Artifical Reinforcement Learning, 2019.
- Frederik Ebert*, Karl Pertsch*, Oleh Rybkin*, Chelsea Finn, **Dinesh Jayaraman**, and Sergey Levine, "HEDGE: Hierarchical Event-Driven Generation", ICML Workshop on Model-Based Reinforcement Learning, 2019.
- Pim de Haan, **Dinesh Jayaraman**, and Sergey Levine, "Causal Confusion in Imitation Learning", NeurIPS Workshop on Causal Learning, 2018 & NeurIPS Workshop on Imitation Learning and its Challenges in Robotics, 2018 (oral spotlight).
- **Dinesh Jayaraman***, Santhosh Kumar Ramakrishnan*, and Kristen Grauman, "Learning Motion Policies for Active Visual Exploration", BayLearn, 2018.
- Roberto Calandra, Andrew Owens, **Dinesh Jayaraman**, Wenzhen Yu, Justin Lin, Jitendra Malik, Edward Adelson, Sergey Levine, "More Than a Feeling: Learning to Grasp and

Regrasp using Vision and Touch", NeurIPS workshop on Acting and Interacting in the Real World, 2017.

- **Dinesh Jayaraman** and Kristen Grauman, "Learning Image Representations from Observer Motions and Interactions", Object Understanding and Interaction Workshop (OUI) at International Conference on Computer Vision (ICCV), 2015.
- **Dinesh Jayaraman** and Kristen Grauman, "Zero-Shot Recognition with Unreliable Attributes", Language and Vision Workshop at Computer Vision and Pattern Recognition (CVPR), 2015.
- **Dinesh Jayaraman**, Fei Sha and Kristen Grauman, "Decorrelating Semantic Visual Attributes by Resisting the Urge to Share", Parts and Attributes Workshop at European Conference on Computer Vision (ECCV), 2014.

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 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-efficiently/, 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.
- "NVAIL Partners present AI Research at ICLR", NVIDIA developer news center. https://news.developer.nvidia.com/nvail-partners-present-ai-research-at-iclr/, May 2020.
- "REPLAB: a low-cost benchmark platform for robotic learning." TechXplore. https://techxplore.com/news/2019-05-replab-low-cost-benchmark-platform-robotic.html

- "Scientists Create Human-like AI Computer Vision", Cami Rosso, PsychologyToday. https://www.psychologytoday.com/us/blog/the-future-brain/201905/scientists-create-human-ai-computer-vision, (May 29, 2019).
- "Developing a good eye", Front page of Science Robotics May 2019, https://robotics.sciencemag.org/content/4/30, May 2019.
- "New Artificial Intelligence Sees Like a Human, Bringing Us Closer to Skynet", Interesting Engineering, May 2019. https://interestingengineering.com/new-artificial-intelligence-sees-like-a-human-bringing-us-closer-to-skynet
- "New AI Sees Like a Human, Filling in the Blanks", UT News, May 2019. https://news.utexas.edu/2019/05/15/new-ai-sees-like-a-human-filling-in-the-blanks/

Professional Service

Organizer:

- Workshop on Embodied Multimodal Learning, NeurIPS '20
- Workshop on Visual Learning and Reasoning for Robotics, RSS '20
- 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

Area Chair:

- International Conference on Learning Representations (ICLR), '21.
- Neural and Information Processing Systems (NeurIPS), '18, '19, '20.
- Association for the Advancement of Artificial Intelligence (AAAI) Conference on Artificial Intelligence, '20, '21.

Associate Editor:

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

Session Chair:

- Neural and Information Processing Systems (NeurIPS), '18

Local Arrangements Chair:

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

Conference Program Committee Member / Reviewer:

- 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
- Robotics: Science and Systems (RSS) '18
- 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
- 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:

- Jyh-Jing Hwang, PhD thesis: Learning Image Segmentation with Relation-Centric Loss and Representation, University of Pennsylvania, '20.

Invited and Conference Talks

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.
Apr 2019	"Towards Embodied Visual Intelligence", University of Southern California, Los Angeles, California, USA.
Mar 2019	"Towards Embodied Visual Intelligence", Massachussetts Institute of Technology, Boston, Massachussetts, USA.
Mar 2019	"Towards Embodied Visual Intelligence", Northeastern University, Boston, Massachussetts, USA.

Mar 2019 "Towards Embodied Visual Intelligence", University of Pennsylvania, Philadelphia, Pennsylvania, USA.

Mar 2019 "Towards Embodied Visual Intelligence", University of North Carolina Chapel Hill, Chapel Hill, North Carolina, USA.

Feb 2019 "Towards Embodied Visual Intelligence", University of Wisconsin-Madison, Madison, Wisconsin, USA.

Feb 2019 "Towards Embodied Visual Intelligence", McGill University, Montreal, Quebec, Canada.

Feb 2019 "Towards Embodied Visual Intelligence", Universite de Montreal, Montreal, Quebec, Canada.

Feb 2019 "Towards Embodied Visual Intelligence", Toyota Technological Institute, Chicago, Illinois, USA.

Feb 2019 "Towards Embodied Visual Intelligence", The University of Michigan, Ann Arbor, Michigan, USA.

Jan 2019 "Towards Embodied Visual Intelligence", Berkeley Artificial Intelligence Research Colloquium, UC Berkeley, USA.

Dec 2018 "Towards Embodied Visual Intelligence", Indian Institute of Science (IISc), Bangalore, India.

Dec 2018 "Towards Embodied Visual Intelligence", IIT Madras, Chennai, India.

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.