Senthil Purushwalkam

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EDUCATION

Robotics Institute, Carnegie Mellon University
Ph.D. in Robotics, 2022
Thesis: Visual Representation and Recognition without Human Supervision

Robotics Institute, Carnegie Mellon University
M.S. in Robotics, 2017

Indian Institute of Technology (IIT), Guwahati
B.Tech. Electronics and Electrical Engineering, 2014
Minor: Computer Science

RESEARCH EXPERIENCE

Senior Research Scientist, Salesforce AI Research — August 2022 - Present

Research Scientist, Salesforce AI Research — Jun 2022 - August 2022

Research Intern, Facebook AI Research — Jun 2020 - August 2020
Advisor: Kristen Grauman

Research Intern, Facebook AI Research — Sept 2018 - Dec 2018
Advisor: Marc'Aurelio Ranzato

Research Intern, Adobe Research — May 2017 - Aug 2017
Advisors: Bryan Russell, Danny Kaufman

Graduate Research Assistant, Carnegie Mellon University — Sept 2015 - May 2022
Advisor: Abhinav Gupta

Research Assistant, Virginia Tech — Sept 2014 - May 2015
Advisor: Dhruv Batra

Research Intern, University of Tokyo — May 2014 - Jul 2014
Advisor: Tatsuya Harada

Research Intern, Virginia Tech — May 2013 - Jul 2013
Advisors: Dhruv Batra, Ross Girshick

Undergraduate Researcher, IIT Guwahati — Aug 2013 - May 2014
Advisor: Suresh Sundaram

PUBLICATIONS

xGen-MM (BLIP-3): A Family of Open Large Multimodal Models [PDF]
Le Xue, Manli Shu, Anas Awadalla, Jun Wang, An Yan, Senthil Purushwalkam,
Honglu Zhou, Viraj Prabhu, Yutong Dai, Michael S Ryoo, Shrikant Kendre, Jieyu Zhang,
Can Qin, Shu Zhang, Chia-Chih Chen, Ning Yu, Juntao Tan, Tulika Manoj Awalgaonkar,
Shelby Heinecke, Huan Wang, Yejin Choi, Ludwig Schmidt, Zeyuan Chen,
Silvio Savarese, Juan Carlos Niebles, Caiming Xiong, Ran Xu
*EVAL-FoMo Workshop at **ECCV 2024***

xGen-VideoSyn-1: High-fidelity Text-to-Video Synthesis with Compressed Representations [PDF]
Can Qin, Congying Xia, Krithika Ramakrishnan, Michael Ryoo, Lifu Tu, Yihao Feng, Manli Shu, Honglu Zhou, Anas Awadalla, Jun Wang, Senthil Purushwalkam, Le Xue, Yingbo Zhou, Huan Wang, Silvio Savarese, Juan Carlos Niebles, Zeyuan Chen, Ran Xu, Caiming Xiong
*AI4VA Workshop at **ECCV 2024***

BootPIG: Bootstrapping Zero-shot Personalized Image Generation Capabilities in Pretrained Diffusion Models [PDF]
Senthil Purushwalkam, Akash Gokul, Shafiq Joty, Nikhil Naik
*SyntheticData4CV Workshop at **ECCV 2024***

Diffusion Model Alignment Using Direct Preference Optimization [PDF]
Bram Wallace, Meihua Dang, Rafael Rafailov, Linqi Zhou, Aaron Lou, Senthil Purushwalkam, Stefano Ermon, Caiming Xiong, Shafiq Joty, Nikhil Naik
*Conference on Computer Vision and Pattern Recognition **(CVPR) 2024***

ConRad: Image Constrained Radiance Fields for 3D Generation from a Single Image [PDF]
Senthil Purushwalkam, Nikhil Naik
*Advances in Neural Information Processing Systems **(NeurIPS) 2023***

The Challenges of Continuous Self-Supervised Learning [PDF]
Senthil Purushwalkam, Pedro Morgado, Abhinav Gupta
*European Conference on Computer Vision **(ECCV) 2022***

The Unsurprising Effectiveness of Pre-trained Vision Models for Control [PDF]
Simone Parisi, Aravind Rajeswaran, Senthil Purushwalkam, Abhinav Gupta
*International Conference on Machine Learning **(ICML) 2022**.*

The Functional Correspondence Problem [PDF]
Zihang Lai*, Senthil Purushwalkam*, Abhinav Gupta
*International Conference on Computer Vision **(ICCV) 2021**.*

Audio-Visual Floorplan Reconstruction [PDF]
Senthil Purushwalkam, Sebastian Vicenc Amengual Gari, Vamsi Krishna Ithapu, Carl Schissler, Philip Robinson, Abhinav Gupta, Kristen Grauman
*International Conference on Computer Vision **(ICCV) 2021**.*

Demystifying Contrastive Self-Supervised Learning: Invariances, Augmentations and Dataset Biases [PDF]
Senthil Purushwalkam, Abhinav Gupta
*Advances in Neural Information Processing Systems 33 **(NeuRIPS) 2020***

Aligning Videos in Space and Time [PDF]
Senthil Purushwalkam, Tian Ye, Saurabh Gupta, Abhinav Gupta
*European Conference on Computer Vision **(ECCV) 2020**.*

Task-Driven Modular Networks for Zero-Shot Compositional Learning [PDF]
Senthil Purushwalkam, Maximilian Nickel, Abhinav Gupta, Marc'Aurelio Ranzato
*International Conference on Computer Vision (**ICCV) 2019**.*

Bounce and Learn: Modeling Scene Dynamics with Real-World Bounces [PDF]
Senthil Purushwalkam, Abhinav Gupta, Danny Kaufman, Bryan Russell
*International Conference on Learning Representations (**ICLR) 2019**.*

Stochastic Multiple Choice Learning for Training Diverse Deep Ensembles. [PDF]
Stefan Lee, Senthil Purushwalkam, Michael Cogswell, Viresh Ranjan, David Crandall, Dhruv Batra
*Advances in Neural Information Processing Systems (**NIPS**) **2016**.*

Pose from Action: Unsupervised Learning of Pose Features based on Motion. **[PDF]**
Senthil Purushwalkam, Abhinav Gupta
Workshop on Action and Anticipation for Visual Learning at **ECCV 2016**.

Applying machine learning to identify autistic adults using imitation: An exploratory study. **[PDF]**
Baihua Li, Arjun Sharma, James Meng, Senthil Purushwalkam, and Emma Gowen.
PloS one 12.8 (2017)

Why M Heads are Better than One: Training a Diverse Ensemble of Deep Networks. **[PDF]**
Stefan Lee, Senthil Purushwalkam, Michael Cogswell, David Crandall, Dhruv Batra.
Arxiv preprint arXiv:1511.06314

Combining the Best of Graphical Models and ConvNets for Semantic Segmentation. **[PDF]**
Michael Cogswell, Xiao Lin, Senthil Purushwalkam, Dhruv Batra.
Arxiv preprint arXiv:1412.4313.

Automatic Segmentation of Adipose Tissue from Thigh Magnetic Resonance Images. **[PDF]**
Senthil Purushwalkam, Baihua Li, Qinggang Meng, Jamie McPhee.
International Conference on Image Analysis and Recognition ***(ICIAR) 2013***.

ACADEMIC DUTIES

Reviewer: ECCV 2018, CVPR 2018, CoRL 2018, ICML 2019, CVPR 2019, ICCV 2019, CVPR 2020, ECCV 2020, NeuRIPS 2020, Shared Visual Representations in Human and Machine Intelligence workshop NeuRIPS 2020, NeuRIPS 2021, CVPR 2021, ICCV 2021, NeurIPS 2021 Workshop Self-Supervised Learning Theory and Practice, CVPR 2022, NeurIPS 2023, CVPR 2024, ECCV 2024

Teaching: Teaching Assistant - Visual Learning and Recognition - Spring 2016 (CMU)
Teaching Assistant - Visual Learning and Recognition - Spring 2017 (CMU)
Teaching Assistant - Visual Learning and Recognition - Spring 2018 (CMU)