Santhosh Kumar Ramakrishnan

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Education

August 2017 - August 2023	Doctor of Philosophy Department of Computer Science, **UT Austin** Advisor: Prof. Kristen Grauman Thesis title: Predictive scene representations for embodied visual search
August 2015 - May 2017	Master of Technology Department of Electrical Engineering, **IIT Madras**, India Advisor: Prof. Anurag Mittal Thesis title: An Empirical Evaluation of Visual Questing Answering for Novel Objects
August 2012 - May 2017	Bachelor of Technology Department of Electrical Engineering, **IIT Madras**, India Minor: Process Optimization

Research interests

Computer vision and robotics

Learning intelligent behaviors for robotic agents and augmented reality assistants, representation learning, leveraging human priors for embodied learning.

Machine learning

Self-supervised learning, transfer learning, multi-modal and multi-task learning.

Academic honors and awards

Dec 2024	One paper selected for oral presentation at CVPR 2024.
Dec 2023	One paper selected for oral presentation at NeurIPS 2023.
Mar 2023	One paper selected as a highlight at CVPR 2023.
Mar 2022	Two papers selected for oral presentation at CVPR 2022.
May 2021	Outstanding reviewer for CVPR 2021.
Jul 2020	Work selected as a spotlight in ECCV 2020.
Jul 2020	Outstanding reviewer for ECCV 2020.
Jun 2020	Winner of Habitat 2020 PointNav challenge held in CVPR 2020.
Jun 2020	Outstanding reviewer for CVPR 2020.
May 2019	Work selected as the cover of Science Robotics Issue.
Jul 2017	Best academic record in B.Tech/M.Tech Electrical Engineering.
Jun 2012	All India Rank 783 in IIT-JEE 2012.
May 2012	Top rank in the Senior School Examination conducted by CBSE, India.

Publications

- K. Grauman, ..., **S. Ramakrishnan***, ..., . "Ego-Exo4D: Understanding Skilled Human Activity from First-and Third-Person Perspectives", Computer Vision and Pattern Recognition (CVPR) 2024 **(oral - 1% acceptance rate)**
- T. Nagarajan, **S. Ramakrishnan**, R. Desai, J. Hillis, K. Grauman. "Egoenv: Human-centric environment representations from egocentric video", Neural Information Processing Systems (NeurIPS) 2023 **(oral - 2% acceptance rate)**
- H. Jiang, **S. Ramakrishnan**, K. Grauman. "Single-stage visual query localization in egocentric videos", Neural Information Processing Systems (NeurIPS) 2023
- K. Ashutosh, **S. Ramakrishnan**, T. Afouras, K. Grauman. "Video-mined task graphs for keystep recognition in instructional videos", Neural Information Processing Systems (NeurIPS) 2023
- C. Paxton, A. Wang, B. Shah, B. Matulevich, D. Shah, K. Yadav, **S. Ramakrishnan**, S. Yenamandra, Y. Bisk. "HomeRobot: An Open Source Software Stack for Mobile Manipulation Research", AAAI Symposium Series 2023
- **S. Ramakrishnan**, Z. Al-Halah, K. Grauman. "SpotEM: Efficient Video Search for Episodic Memory", International Conference on Machine Learning (ICML) 2023
- **S. Ramakrishnan**, Z. Al-Halah, K. Grauman. "NaQ: Leveraging Narrations as Queries to Supervise Episodic Memory", Computer Vision and Pattern Recognition (CVPR) 2023
- K. Yadav*, R. Ramrakhya*, **S. Ramakrishnan***, T. Gervet, J. Turner, A. Gokaslan, N. Maestre, A.Chang, D. Batra, M. Savva, A. Clegg, D. Chaplot. "Habitat-matterport 3d semantics dataset", Computer Vision and Pattern Recognition (CVPR) 2023 **(highlight - 2.5% acceptance rate)**
- K. Grauman, A. Westbury, E. Byrne*, Z. Chavis*, A. Furnari*, R. Girdhar*, J. Hamburger*, H. Jiang*, M. Liu*, X. Liu*, M. Martin*, T. Nagarajan*, I. Radasavovic*, **S. Ramakrishnan***, ... and J. Malik. "Ego4D: Around the World in 3,000 hours of Egocentric Video", Computer Vision and Pattern Recognition (CVPR) 2022 **(oral - 5% acceptance rate)**
- **S. Ramakrishnan**, D. Chaplot, Z. Al-Halah, J. Malik, and K. Grauman, "PONI: Potential Functions for ObjectGoal Navigation with Interaction-free Learning", Computer Vision and Pattern Recognition (CVPR) 2022 **(oral - 5% acceptance rate)**
- Z. Al-Halah, **S. Ramakrishnan**, and K. Grauman, "Zero Experience Required: Plug & Play Modular Transfer Learning for Semantic Visual Navigation", Computer Vision and Pattern Recognition (CVPR) 2022
- **S. Ramakrishnan**, T. Nagarajan, Z. Al-Halah, and K. Grauman, "Environment Predictive Coding for Visual Navigation", International Conference on Learning Representations (ICLR) 2022
- **S. Ramakrishnan**, A. Gokaslan, E. Wijmans, O. Maksymets, A. Clegg, J.M. Turner, E. Undersander, W. Galuba, A. Westbury, A.X. Chang, M. Savva, Y. Zhao and D.Batra, "Habitat-Matterport 3D Dataset (HM3D): 1000 Large-scale 3D Environments for Embodied AI", Neural Information Processing Systems 2021 Datasets and Benchmarks Track.
- C. Chen, S. Majumder, Z. Al-Halah, R. Gao, **S. Ramakrishnan** and K. Grauman, "Learning to Set Waypoints for Audio-Visual Navigation", International Conference on Learning Representations (ICLR) 2021
- **S. Ramakrishnan**, D. Jayaraman, and K. Grauman, "An Exploration of Embodied Visual Exploration", International Journal of Computer Vision, 2021

- **S. Ramakrishnan**, Z. Al-Halah and K. Grauman, "Occupancy Anticipation for Efficient Exploration and Navigation", European Conference on Computer Vision (ECCV) 2020 **(spotlight - 3% acceptance rate)**
- **S. Ramakrishnan***, D. Jayaraman*, and K. Grauman, "Emergence of Exploratory Look-Around Behaviors through Active Observation Completion", Science Robotics, 2019 **(appeared on the cover of special issue)**
- **S. Ramakrishnan** and K. Grauman, "Sidekick Policy Learning for Active Visual Exploration", European Conference on Computer Vision (ECCV) 2018
- **S. Ramakrishnan**, A. Pal, G. Sharma, and A. Mittal, "An Empirical Evaluation of Visual Question Answering for Novel Objects", Computer Vision and Pattern Recognition (CVPR) 2017

Theses

- **S. Ramakrishnan**, "Predictive scene representations for embodied visual search". Ph.D. dissertation. Supervisor: K. Grauman, UT Austin, 2023
- **S. Ramakrishnan**, "An Empirical Evaluation of Visual Question Answering for Novel Objects". Masters Thesis. Supervisors: Prof. A. Mittal, Prof. R. Aravind, IIT Madras, 2017

Work Experience

Oct 2023 - Now		*Postdoctoral researcher*, **Apple Inc.**
Jan 2018 - Aug 2023		*Graduate Research Assistant*, **UT Austin**
Apr 2020 - Mar 2022		*Visiting Researcher*, **Facebook AI Research**
May 2018 - Aug 2018		*Research Intern*, **Facebook AI Research**
May 2016 - Aug 2016		*Research Intern*, **IIT Kanpur**
May 2014 - Jan 2015		*Software engineering Intern*, **HyperVerge Inc.**

Professional service

Program Committee Member / Reviewer:

- Computer Vision and Pattern Recognition (CVPR) '19, '20, '21, '22, '23
- International Conference on Computer Vision (ICCV) '19, '21, '23
- European Conference on Computer Vision (ECCV) '20, '24
- AAAI Conference on Artificial Intelligence (AAAI) '20, '21, '22, '24
- International Conference on Learning Representations (ICLR) '22
- International Conference on Robotics and Automation (ICRA) '21
- Winter Conference on Applications of Computer Vision (WACV) '21
- International Journal for Computer Vision '19, '23

Invited and Conference Talks

Jun 2022	Oral presentation talk, CVPR 2022.
Jun 2021	Keynote at Neural Architecture Search workshop, CVPR 2021.

Apr 2021	Invited talk, Accelerated Transfer Program, UT Austin.
Aug 2020	Spotlight talk, ECCV 2020.
July 2020	Habitat Challenge winning team, Embodied AI Workshop, CVPR 2020.
Jun 2019	Invited talk, Indian Institute of Technology, Madras, India.

Open Sourced Software and Datasets

EgoExo4D dataset	https://ego-exo4d-data.org/
NaQ	https://github.com/srama2512/NaQ
HM3DSem dataset	https://aihabitat.org/datasets/hm3d-semantics/
PONI	https://github.com/srama2512/PONI
Ego4D dataset	https://github.com/EGO4D
EPC	https://github.com/srama2512/EPC-SSL
HM3D dataset	https://github.com/facebookresearch/habitat-matterport3d-dataset
Occupancy anticipation	https://github.com/facebookresearch/OccupancyAnticipation
Exploring exploration	https://github.com/facebookresearch/exploring_exploration
Visual exploration	https://github.com/srama2512/visual-exploration
Sidekick policy learning	https://github.com/srama2512/sidekicks
MapNet	https://github.com/srama2512/mapnet-pytorch

Media coverage

VentureBeat	Facebook introduces dataset and benchmarks to make AI more 'egocentric'
UTexas news	TXCS Research Team Wins 2020 PointNav Challenge
MIT Technology Review	Facebook is training robot assistants to hear as well as see
ZDNet	Facebook is building robots to help you find your ringing phone
VentureBeat	Facebook releases tools to help AI navigate complex environments.
Facebook AI	New milestones in embodied AI.
Inside AI	Facebook announced three new milestones in its AI Habitat training.
Science daily	New AI sees like a human, filling in the blanks.
Psychology Today	Scientists create human-like AI Computer Vision.
UTexas news	New AI sees like a human, filling in the blanks.