Ishika Singh

PH.D. CANDIDATE · COMPUTER SCIENCE · USC

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Education

University of Southern California   *Los Angeles, CA*
PHD IN COMPUTER SCIENCE   *2021-present*
Advisor: Prof. Jesse Thomason
Research Interests: Vision language action models, embodied AI, language and 3D perception for robotic manipulation, imitation learning, multi-agent task planning, robot learning, vision and language navigation.

Indian Institute of Technology (IIT) Kanpur   *India*
B.TECH, DOUBLE MAJOR IN COMPUTER SCIENCE AND CHEMICAL ENGINEERING   *2016 - 2021*

Awards

2025	**RSS Pioneer**, 33 selected (14.6% acceptance) top early-career robotics researchers worldwide	*Global*
2024	**Qualcomm Innovation Fellowship finalist**, US-wide fellowship program for PhD studnets	*USA*
2021	**USC Graduate Fellowship**, for 1 year of the Ph.D. program	*USA*
2020	**Adobe India Women in Technology Scholarship**, 5 undergrad/masters awardees nation-wide	*India*
2019-20	**Academic Excellence Award**, for both majors, given to **top 10%** students in the department	*India*
2019	**Grand Prize**, worth 6,800 USD, Deloitte TechnoUtsav2.0 AI competition, **1ˢᵗ** in 9.5K+ contestants	*India*

Experience

Amazon Frontier AI and Robotics | APPLIED SCIENTIST INTERN   *May - Aug'25* | *SF, CA*
Research topic(s): Robotic Foundation models.

NVIDIA Seattle Robotics Lab | RESEARCH INTERN   *May'24 - May'25* | *Seattle, WA*
Research topic(s): Vision-Language Action models, 3D perception based robot instruction following using LLMs and VLMs.

GLAMOR Lab, USC | PI: PROF. JESSE THOMASON   *Aug'21 - Present* | *LA, CA*
Research topic(s): Multi-agent collaborative hierarchical planning, generative data augmentation for robot learning, 3D representation learning for robotics, data cartography, vision and language navigation.
Simulators worked with: AI2THOR, Habitat, RLBench, VirtualHome, Matterport 3D Simulator (topological and Habitat-based continuous)

NVIDIA Seattle Robotics Lab | RESEARCH INTERN   *May - Sept'22* | *Seattle, WA*
Research topic(s): Long-horizon robot task planning using LLMs

Exploration Lab, IIT Kanpur | PI: PROF. ASHUTOSH MODI   *Jan'20 - Jul'21* | *India*
Research topic(s): Text-based games, RL, affective language modeling, text generation

Big Data Labs, Adobe Research | RESEARCH INTERN   *Apr - July'20* | *India*
Research topic(s): Information retrieval, natural language reasoning

UC San Diego | PI: PROF. PENGTAO XIE   *Jan - May'20* | *Remote*
Research topic(s): Differential privacy, theoretical ML, federated neural architecture search, optimization

Conference Papers
*equal contribution

Language Models can Infer Action Semantics for Classical Planners from Environment Feedback   *NAACL 2025*
WANG ZHU, **ISHIKA SINGH**, ROBIN JIA, AND JESSE THOMASON   *[arXiv]*
Annual Conference of the Nations of the Americas Chapter of the Association for Computational Linguistics 2025

THE COLOSSEUM: A Benchmark for Evaluating Generalization for Robotic Manipulation

WILBERT PUMACAY*, **ISHIKA SINGH***, JIAFEI DUAN*, RANJAY KRISHNA, JESSE THOMASON, DIETER FOX

Robotics: Science and Systems (RSS) 2024
Also in *A Future Roadmap for Sensorimotor Skill Learning for Robot Manipulation workshop @ ICRA 2024;*
Embodied AI workshop @ CVPR 2024

RSS 2024

[arXiv | website]

ProgPrompt: Generating Situated Robot Task Plans using Large Language Models

ISHIKA SINGH, VALTS BLUKIS, ARSALAN MOUSAVIAN, ANKIT GOYAL, DANFEI XU, JONATHAN TREMBLAY, DIETER FOX, JESSE THOMASON, ANIMESH GARG

IEEE International Conference on Robotics and Automation (ICRA) 2023
Also in *LaReL workshop @ NeurIPS 2022; LangRob workshop @ CoRL 2022*
Invited journal paper in *Autonomous Robots 2023 - Special Issue: Large Language Models in Robotics*

ICRA 2023, AuRo 2023

[arXiv | website | SciAm| CACM]

Pre-trained Language Models as Prior Knowledge for Playing Text-based Games

ISHIKA SINGH, GARGI SINGH, ASHUTOSH MODI

International Conference on Autonomous Agents and Multiagent Systems 2022: Extended Abstract

AAMAS 2022

[arXiv | code]

Adapting a Language Model for Controlled Affective Text Generation

ISHIKA SINGH*, AHSAN BARKATI*, TUSHAR GOSWAMY, ASHUTOSH MODI

International Conference on Computational Linguistics 2020 (Long Paper, Oral)
Also in *Wordplay: When Language Meets Games workshop @ NeurIPS 2020*

COLING 2020

[arXiv | talk | code]

Preprints _____

OG-VLA: 3D-Aware Vision Language Action Modeling via Orthographic Image Generation

ISHIKA SINGH, ANKIT GOYAL, STAN BIRCHFIELD, DIETER FOX, ANIMESH GARG, VALTS BLUKIS
Submitted to CoRL 2025

To be on arXiv soon

TwoStep: Multi-agent Task Planning using Classical Planners and Large Language Models

DAVID BAI*,**ISHIKA SINGH***, DAVID TRAUM, AND JESSE THOMASON
Submitted to IROS 2025

arXiv

[arXiv]

Workshop Papers _____

Self-Supervised 3D Representation Learning for Robotics

ISHIKA SINGH, ANTHONY LIANG, MOHIT SHRIDHAR, JESSE THOMASON
Pretraining4Robotics Workshop @ ICRA 2023

PT4R-ICRA'23

[pdf]

Noisy Instructions Are All You Need for VLN Pretraining

WANG ZHU, **ISHIKA SINGH***, YUAN HUANG*, ROBIN JIA, JESSE THOMASON
Open-Domain Reasoning Under Multi-Modal Settings workshop @ CVPR 2023

O-DRUM - CVPR'23

[arXiv]

Transformer Adapters for Robot Learning

ANTHONY LIANG, **ISHIKA SINGH**, KARL PERTSCH, JESSE THOMASON
Pretraining for Robot Learning workshop @ CoRL 2022

PRL-CoRL'22

[pdf]

Differentially-private Federated Neural Architecture Search

ISHIKA SINGH*, HAOYI ZHOU*, KUNLIN YANG, MENG DING, BILL LIN, PENGTAO XIE
Federated Learning for User Privacy & Data Confidentiality workshop @ ICML 2020 (Long Presentation)

FL-ICML'20

[arXiv | code]

Patents _____

Prompt Generator for Use with One or More Machine Learning Processes

ISHIKA SINGH, ARSALAN MOUSAVIAN, ANKIT GOYAL, DANFEI XU, JONATHAN TREMBLAY, DIETER FOX, ANIMESH GARG, VALTS BLUKIS
US Patent No. 2024/0095077 | NVIDIA Research

US Patent 2024

[pdf]

Machine-Learning Techniques for Augmenting Electronic Documents with Data-Verification Indicators

Navita Goyal, Vipul Shankhpal, Priyanshu Gupta, **Ishika Singh**, Baldip Bijlani, Anandhavelu N
US Patent No. 2022/0171935 | Adobe Research

Academic Service

- Co-organizing Workshop on Semantic Reasoning for Robotics, RSS'25.
- Co-organizing Workshop on 3D Vision Language Models (VLMs) for Robotics, CVPR'25.
- Published a blog on 'Language Models meet Classical Planners to make smarter Robot Task Plans' as part of blog of Robotics and Autonomous Systems Center at USC.
- Teaching Assistant for graduate course: CSCI-699, Robot Learning with Prof. Erdem Biyik in Fall'24.
- Co-organizing the 3rd Workshop on Language and Robot Learning, CoRL'24.
- Reviewer for conference papers: EMNLP'23, Humanoid'23, ICRA'24, RA-L'23, UR'24, RA-L'24, IROS'24, CoRL'24, ICLR'24, AuRo'24, RA-L'25.
- Reviewer for workshop proposals: RO-MAN'24.
- Guest lecture in undergraduate course: CSCI-499 Natural Language Processing for Interactive AI in Fall'22.
- Mentored 4 BS/MS student for research projects in GLAMOR lab, on vision-language robot navigation in simulation and real-world, data cartography for sequential decision-making tasks, robot learning, and multi-agent planning.
- Co-organized vision-and-dialogue TEACh TATC Challenge at the Embodied AI Workshop, CVPR'22 and CVPR'23.
- Presented project demos at Robotics Open House 2023 and 2024, hosted by USC Viterbi K-12 STEM Center.
- Student volunteer for: virtual organization of ICLR'20, ICML'20, etc.