

Ishika Singh

PH.D. STUDENT · COMPUTER SCIENCE · USC

✉ ishikasi@usc.edu | 🏠 ishikasingh.github.io | 🎓 google scholar

Education

University of Southern California

Los Angeles, CA

PHD IN COMPUTER SCIENCE

2021-present

Advisor: Prof. Jesse Thomason

Research Interests: 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

Experience

NVIDIA Seattle Robotics Lab | RESEARCH INTERN W/ DR. VALTS BLUKIS AND PROF. ANIMESH GARG May - Aug'24 | Seattle, WA

Research topic(s): 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, RL Bench, VirtualHome, Matterport 3D Simulator (topological and Habitat-based continuous)

NVIDIA Seattle Robotics Lab | RESEARCH INTERN W/ DR. VALTS BLUKIS AND PROF. ANIMESH GARG 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

THE COLOSSEUM: A Benchmark for Evaluating Generalization for Robotic Manipulation

RSS 2024

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

[arXiv | website]

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

ProgPrompt: Generating Situated Robot Task Plans using Large Language Models

ICRA 2023, AuRo 2023

ISHIKA SINGH, VALTS BLUKIS, ARSALAN MOUSAVIAN, ANKIT GOYAL, DANFEI XU, JONATHAN TREMBLAY,

[arXiv | website | SciAm]

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

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

Language Models can Infer Action Semantics for Classical Planners from Environment Feedback

WANG ZHU, ISHIKA SINGH, ROBIN JIA, AND JESSE THOMASON

In submission at NeurIPS'24

[arXiv](#)

[[arXiv](#)]

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

ISHIKA SINGH, DAVID TRAUM, AND JESSE THOMASON

In submission at ICRA'25

[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

US Patent 2022

[[pdf](#)]

Awards

2024	Qualcomm Innovation Fellowship finalist , US-wide fellowship program for PhD students	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 TechnoUtsav 2.0 AI competition, 1st in 9.5K+ contestants	India

Academic Service

- 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 [Language and Robot Learning Workshop](#), CoRL'24.
- Reviewer for conference papers: EMNLP'23, Humanoid'23, ICRA'24, RA-L'23, UR'24, RA-L'24, IROS'24, CoRL'24.
- 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, and robot learning.
- Co-organized vision-and-dialogue [TEAch TATC Challenge](#) at 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.