

Mousumi Das

✉ mousumid@usc.edu

☎ +1 (213) 275-8684

🌐 [Mousumi Das](#)

🔗 [Google Scholar](#)

🔗 [Mousumi625](#)

EDUCATION

University of Southern California

Jan 2025 – Dec 2026

M.S. in Electrical and Computer Engineering (Machine Learning & Data Science)

Los Angeles, CA

- *Relevant Courses:* Linear Algebra for Engineering (EE 510), Probability for ECE (EE 503), Robot Mobility (EE 579), Robot Learning (CSCI 699), Deep Learning (EE 541)

RESEARCH INTERESTS

- **Robot Learning & Imitation Learning:** leveraging structure in expert demonstrations (pedagogical intent, per-example informativeness) for sample-efficient, OOD-robust manipulation policies.
- **VLA Composition:** Dynamically composing multiple VLA and control policies during execution via offline RL, with evaluation pipelines spanning tabletop and real-world manipulation, directly applicable to flexible automation cells where product mix and task variation demand dynamic policy selection
- **Language-Guided Robotics & Embodied AI:** dialogue-driven, RAG-augmented, and language-conditioned policies for embodied decision-making, scene understanding, and vision-language navigation.
- **Vision-Grounded Perception for Manipulation:** Building scalable perception pipelines spanning instance segmentation, conditioned image synthesis, and vision-language grounding to enable reliable scene understanding for contact-rich robot tasks.
- **Vision-Language Models & VLAs:** reliability of VLM/VLA backbones via probing, lightweight evaluators, and behavior-grounded benchmarks.

ACADEMIC WORKS

[1] **Imitation Learning from Deliberative Teachers**

Mousumi Das, Erdem Bıyık

In preparation. Target: ICLR 2026.

[2] **SWAP: Stepwise Action Policy Routing for Vision-Language-Action Models**

Mousumi Das, Aditeya Prajapati, Abrar Anwar, Jesse Thomason

Submitted to CoRL 2026.

[3] **DiPS: Dialogue Policy Selection for High-Stakes Persuasion Agents** [\[Link\]](#)

Tianyi Zhang*, Mousumi Das*, Abrar Anwar, Jesse Thomason, David Traum

SIGDIAL 2026 — ACL/ISCA Special Interest Group on Discourse and Dialogue.

[4] **Hand Gesture Recognition using DenseNet201-Mediapipe Hybrid Modelling** [\[Link\]](#)

Prachetas Padhi*, Mousumi Das*

IEEE, 2022.

* denotes equal contribution.

RESEARCH EXPERIENCE

Georgia Tech Research Institute (GTRI)

May 2026 – Present

Research Intern — Intelligent Robotics & Autonomous Systems, PI: Colin Usher

Atlanta, GA

- Designing a vision-based pick-selection system for deformable objects by decoupling perception from selection via three frozen foundation models: **SAM2** (instance segmentation), **DINOv2** (768-dim embeddings augmented with geometric depth features), and **AnyGrasp** (6-DOF grasp generation).
- Trained a **pairwise ranking MLP** via a **RankNet** objective on VR operator demonstrations as the sole learned component; deployed with a **human-in-the-loop** adaptation loop where corrections trigger lightweight ranker updates over a rolling replay buffer, enabling environment-agnostic continuous improvement without scheduled retraining.

University of Southern California

Research Assistant — [LIRA Lab](#), PI: Prof. Erdem Biyik

Jan 2026 – Present

Los Angeles, CA

- Developing **TV-BC (Teaching-Volume Behavioral Cloning)**, an imitation learning method that upweights demonstrations where learner loss exceeds expert loss, prioritizing hard, informative examples via a softmax-weighted BC loss derived from machine teaching theory.
- Evaluated TV-BC vs. standard BC on three Procgen CoinRun settings (single-level, in-distribution, OOD) using an **IMPALA ResNet** expert and a 373K-parameter CNN learner; achieved **+21.7%** early-round solve-rate gain, **+16.7%** OOD advantage at peak, **4×** lower cross-seed variance in OOD, and winning all 3 seeds at the final in-distribution round.

University of Southern California

Research Assistant — [GLAMOR Lab](#), PI: Prof. Jesse Thomason

Jun 2025 – Present

Los Angeles, CA

- Designed **SWAP (Stepwise Action Policy Routing)** for dynamically composing multiple VLA policies during execution; formulated routing as offline RL, training a routing critic that selects among π_0 , OPENVLA, and keypoint-based controllers per decision step. Evaluated on real-world DROID and LIBERO; up to **+33%** task success and **−28.3%** trajectory length vs. fixed-policy and routing baselines.
- Built the multi-policy evaluation infrastructure for tabletop manipulation on the LIBERO benchmark with real-world deployment on the **Franka Panda** arm; integrated **contrast-set perturbations** and **conformal prediction** to improve hidden-state probe failure detection under deployment-time distribution shifts.
- Developed a real-time policy selection algorithm using **Implicit Q-Learning (IQL)** for adaptive operator decision-making during wildfire evacuation dialogues; outperformed random and fixed-policy baselines across diverse resident profiles.
- Designed a context-aware **RAG** module conditioning response generation on dialogue history via **SBERT** embeddings, **FAISS** retrieval, and instruction-tuned **LLaMA-3**; integrated end-to-end so dialogue outcomes trigger evacuation decisions and emergency dispatch.

RELEVANT PROJECTS

Hidden-State Probing for VLM Hallucination Detection

Mar 2025 – May 2025

- Implemented **hidden-state probes** on VLM representations to approximate hallucination metrics (factuality, consistency, modality alignment), replacing heavy external evaluators with lightweight linear probes; benchmarked on **MHaluBench** with dashboards for cross-modal error analysis across VLM checkpoints.

Voice and Vision Controlled Robotic Hand [\[Link\]](#)

Jan 2023 – Mar 2023

- Built a robotic hand interface combining **ASR** (speech-to-text) for voice control with **Mediapipe** landmark tracking for real-time gesture replication; encoded finger-joint angles to servo commands dispatched via microcontroller, achieving sub-100 ms end-to-end latency.

Automated Sortation of Packages in a Warehouse [\[Link\]](#)

Oct 2021 – Jan 2022

- Coordinated a swarm of mobile bots tracked via **ArUco markers** and an overhead camera, with **A*** path planning and WiFi-relayed routing commands to onboard microcontrollers; reduced average sort cycle time by **35%** vs. a fixed-route baseline.

TECHNICAL SKILLS

Programming: Python, C++, SQL, Bash/Shell, MATLAB, Git

Robot Frameworks & Simulation: ROS 2, MoveIt 2, LeRobot, IsaacGym, Isaac Sim / Isaac Lab, Gazebo, MuJoCo, robosuite, Libero, DROID, Franka Control Interface (FCI), OpenAI Gym / Gymnasium

Perception & Scene Understanding: SAM2, DINOv2, CLIP, SigLIP, GroundingDINO, Open3D, OpenCV, RealSense SDK, MMDetection, Mediapipe, DepthAnything

VLAs & Foundation Models: OpenVLA, π_0 , MolmoAct, Octo, AnyGrasp, LLaMA-3, SBERT, FAISS, LangChain, RAG pipelines, BART, LoRA / QLoRA

RL & Policy Learning: IQL, SAC, PPO, IMPALA, HER, Behavioral Cloning, DAgger, Diffusion Policy, ACT (Action Chunking Transformer), offline RL, reward modeling, RLHF

ML / DL & Tooling: PyTorch, TensorFlow, Hugging Face Transformers, Scikit-learn, JAX (basic), Weights & Biases, HDF5, Docker, AWS (S3, EC2, SageMaker), RESTful APIs