Khawaja Abaid Ullah

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PhD researcher studying multi-agent coordination and decision-making for autonomous systems, focusing on decentralized task allocation and LLM-assisted planning. My long-term goal is reliable multi-robot coordination for search and rescue.

Education

PhD in Electrical and Computer Engineering **Jun 2026 - Expected May 2029**
Rochester Institute of Technology *Rochester, NY*
- Fully funded research assistantship at Khojasteh Autonomous Systems Laboratory.

M.S. in Artificial Intelligence **Aug 2024 - May 2026**
Rochester Institute of Technology *Rochester, NY*
- GPA: 4.0/4.0. Fully funded by the U.S. Department of State Fulbright Scholarship.
- Thesis: "Antidistillation Sampling for Classification."

B.S. in Computer Science **2017 - 2021**
University of Narowal *Narowal, Pakistan*
- Graduated first in the Computer Science class of 2021.

Selected Papers

Khawaja Abaid Ullah, Ananya Acharya, Mohammad Javad Khojasteh. *Consensus Within, Competition Between: Decentralized LLM Teams for Perimeter Defense.* 2026. Preprint; under review. Paper | Code
- Found that decentralized LLM teams using an external auction-based conflict-resolution protocol (CBAA) achieved lower breach rates than centralized or independently acting teams in simulated perimeter defense.
- Developed a reproducible testbed for evaluating LLM coordination under communication constraints, with experiments examining decision authority and multimodal visual deception.

Khawaja Abaid Ullah, Mohammad Javad Khojasteh. *ADS-C: Antidistillation Sampling for Classification.* 2026. Preprint; under review, IEEE Open Journal of the Computer Society. Paper | Code
- Developed ADS-C to hinder model extraction through knowledge distillation while provably preserving the classifier's top-1 predictions.
- Reduced distilled-student accuracy across three image-classification benchmarks, including a 29.6-percentage-point reduction on CIFAR-10; released the defense and evaluation pipeline in PyTorch.

Khawaja Abaid Ullah, Mohammad Javad Khojasteh. *AntidistillBench: A Unified Benchmark of Test-Time Antidistillation Defenses for Classification.* 2026. Manuscript under review.
- Developed a first-of-its-kind unified benchmark for test-time antidistillation defenses in classification.
- Implemented existing defenses under a common threat model and matched-cost evaluation protocol, enabling direct comparisons of their ability to suppress student learning.

Research Experience

Graduate Research Assistant – KAS Lab **Jun 2026 – Present**
Rochester Institute of Technology *Rochester, NY*
- Study coordination, communication, and task and resource allocation in autonomous multi-agent systems, with the long-term goal of robot teams for search and rescue.
- Explore multi-agent reinforcement learning and neural combinatorial optimization, including LLM-assisted approaches, for decentralized planning and allocation.

Industry Experience

Software Development Engineer, AI/ML Intern **May 2025 - Aug 2025**
Amazon Web Services (AWS) *East Palo Alto, CA*
- Built Apache Spark testing modules for an internal benchmarking platform, bringing targeted workflows to feature parity with the legacy system.
- Exceeded the original project scope by independently identifying and implementing additional benchmarking capabilities, earning strong recognition from team leadership and a full-time return offer.

Junior Python Developer (Remote) **Feb 2023 - May 2023**
Comundo *Copenhagen, Denmark*
- Built semi-supervised web-scraping and data-curation pipelines for energy-consumption data; cleaned and aggregated outputs for CO2 estimation and downstream ML forecasting.

Open-Source Contributions

Open-Source Developer **May 2022 - Aug 2024**
Independent

Teras - GitHub
- Created a Keras 3 tabular deep-learning library supporting JAX, PyTorch, and TensorFlow; implemented published architectures for classification, regression, data imputation, and synthetic-data generation.

Keras – Merged PR
- Contributed Beta and Binomial random samplers and unit tests to Keras 3 across JAX, PyTorch, TensorFlow, and NumPy; merged upstream.

micrograd_c - GitHub
- Implemented Andrej Karpathy's micrograd from scratch in C: a scalar autograd engine and neural-network library with a PyTorch-like API.

Technical Skills

Languages: Python, C, C++, Bash
ML Frameworks: JAX, Flax, Keras, PyTorch, TensorFlow, NumPy, RLlib, Stable Baselines
Systems and Tools: Linux, Docker, Git, Apache Spark, ROS 1, ROS 2, Arduino

Selected Projects

Fontus - Multi-Agent RL for Aerial UAV Recharging **Dec 2025**
- Built a custom PettingZoo Parallel environment for UAV recharging with vectorized NumPy dynamics; trained parameter-shared PPO policies using PyTorch and Ray RLlib.
- Established an analytical no-charge baseline and diagnosed reward exploitation: policies earned higher rewards through passive survival without accomplishing the refueling task.

codriver – Compact Contextual Code Generation **Dec 2024**
- Built a 260M-parameter contextual code-generation model using staged knowledge distillation from Gemma 2 2B on text and CodeGemma 2B on code.
- Ported the Gemma 2 implementation from Flax Linen to Flax NNX to support the custom student model and training pipeline.

Teaching, Service & Honors

Teaching Assistant - Principles of Robotics **Aug 2026 - Present**
Rochester Institute of Technology *Rochester, NY*
- Develop lecture and laboratory material for a combined undergraduate and graduate robotics course; labs use ROS 1, ROS 2, and Arduino.
- Built ROS-based Docker containers and reproducible VM images for the full lab sequence, replacing a brittle third-party dependency.

Reviewer, IEEE Signal Processing Letters **Jun 2026 - Present**

Honors: Fulbright Scholar (U.S. Department of State); Kaggle Expert.