

Amazon - Virginia Tech Initiative for Efficient and Robust Machine Learning
Call for Research Proposals

Last year Virginia Tech and Amazon announced their partnership to advance research and innovation in artificial intelligence and machine learning. [The Amazon - Virginia Tech Initiative for Efficient and Robust Machine Learning](#) supports machine learning-focused research projects, doctoral student fellowships, community outreach, and an establishment of a shared advisory board.

The Amazon-Virginia Tech Initiative for Efficient and Robust Machine Learning (ML) is soliciting proposals from Virginia Tech faculty in the College of Engineering for research projects with anticipated support beginning Fall Semester 2023 (FY 2024). The objective of this initiative is to advance research and innovation in Artificial Intelligence (AI) and ML, specifically in the areas of efficient and robust machine learning. Virginia Tech faculty members are invited to submit proposals for research projects that work to revolutionize the way ML is developed, evaluated, and embedded in everyday contexts, devices, and applications (see below for list of topics of interest).

Topics of interest for this year include:

Thrust	Theme	Topic Details
Algorithmic Research	Federated Learning	Models, algorithms, applications
	Robust Machine Learning	Updatable ML; Online incremental learning: algorithms, online performance and its evaluation and robustness; Self-supervised learning as applied to detection tasks; ML Risk Assessment: Quantifying and characterizing risks due to stability, drift, uncertainty, interpretability, lack of recourse, and adversaries, metrics to measure robustness and evaluating robustness of ML models
NLP and Conversational AI	Efficient and Robust Conversational AI	Efficient and Robust open-domain conversational AI, Multimodal conversational AI, Conversational Embodied Robotics AI, Automated learning from human feedback in dialog systems
	Responsible AI	Information veracity: approaches to measure information truthfulness and use in applications like fact verification or detecting hallucination in conversational language models
Systems Research	New Cloud Programming Abstractions	New systems programming abstractions for cloud ML and edge ML

	Improving Memory Footprints	Improving memory footprints of ML models for use in resource-constrained environments
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While the above topics are particularly of interest, highly meritorious proposals in other areas of ML and AI will also be considered.

Proposals should be submitted by a Virginia Tech faculty member serving as a PI and can include 1-2 Co-PIs. Proposals may request support for undergraduate students, graduate students, postdoctoral research associates, faculty, travel, equipment, and/or other expenses as deemed necessary for the successful execution of the project.

Projects cannot exceed one year in duration. Projects with longer-running aims will need to apply again for future year(s) of funding. Proposed budgets are expected to be in the range of \$50 - 100K direct costs (with most awards expected to be in the middle of this range). A faculty member can be PI or Co-PI on at most one proposal to this solicitation.

Proposals will be evaluated by a collaborative advisory board composed of Virginia Tech faculty and Amazon researchers for their technical merits, potential to advance research in areas of ML, and opportunity for impact. Proposals selected for funding will be awarded either as gifts or sponsored awards (will be decided based on project goals and objectives). The initiative reserves the right to negotiate awards to fulfill overall program goals.

Proposal Materials:

Interested participants should submit one PDF document comprising:

- Proposal (single-spaced, 12 pt font, 1” margins, 3 pages max)
- Sections should include Abstract (~200 words), Motivation, Statement of the Problem, Proposed Activities and Timeline, Primary Team Members and Roles, Background IP (if none, state so), and Simple ROM Itemized Budget with justification. A formal OSP budget is not needed. Include all direct costs but only direct costs (do not include overhead calculations in your budget).
- References (1 page max)
- CVs of Investigators (2 pages max per investigator)

Timeline

- March 1, 2023 (5pm EDT): Applications Due
- June 1, 2023: Decisions Announced
- Aug 10, 2023: Projects begin in the Fall Semester
- July 31, 2024: PIs submit a 2-page report

Proposal submissions and any questions about proposal submissions should be addressed to Wanawsha Shalaby, Manager of Operations at the Sanghani Center, wanah92@vt.edu.

Review Criteria

A joint VT-Amazon advisory board will review applications based upon

- Novelty
- Relevance to Alexa
- Practicality