

Amazon - Virginia Tech Initiative for Efficient and Robust Machine Learning
Call for Doctoral Student Fellowships

The [Amazon-Virginia Tech Initiative for Efficient and Robust Machine Learning](#) invites nominations for doctoral student fellows with anticipated support beginning Fall Semester 2025. Fellowships will be awarded to Virginia Tech doctoral students that includes one academic year of funding, tuition, travel support to conferences, and an invitation to interview for an Amazon internship intended to provide students a greater understanding of industry and use-inspired research. Students selected for fellowships will be known as **Amazon Fellows**. The fellowship enables students during the academic year to pursue independent research projects in the areas of machine learning and artificial intelligence and the optional paid summer internship at Amazon will enable them to gain valuable industry insight and experience through direct engagement with Amazon researchers.

Nominations for fellowships should be made by Virginia Tech faculty members. Students cannot submit nominations on behalf of their advisor. Students must be enrolled in a PhD program at Virginia Tech, be in good standing, and should have exhibited outstanding academic performance to be eligible for a fellowship. Additionally, students must be in the second, third, or fourth year of their Ph.D. studies and pursuing doctoral-level research in machine learning, data science, AI, and/or NLP.

Context:

Amazon is improving customers' lives with practical, useful generative AI innovations. We do this by building and deploying AI across three technology layers: at the bottom layer we offer our own high performance and cost-effective custom chips, as well as a variety of other computing options including from third-parties. At the middle layer, we offer customers choice by providing the broadest selection of Foundation Models—both Amazon-built as well as those from other leading providers. At the top layer we offer generative AI applications and services to improve every customer experience.

There are three things that distinguish Amazon's approach to the development and deployment of AI:

1. Maintaining a strategic focus on improving the customer and employee experience through practical, real-world applications of AI;
2. Marshaling our world-class data, compute, and talent resources to drive AI innovation; and
3. Committing to the development of responsible, reliable, and trustworthy AI.

Topics of interest would include, but are not limited to, those below. Please feel free to bring your/your institution's unique viewpoint and expertise to these topics:

- **Foundation Model Improvements**
 - Novel model architectures
 - Novel training algorithms and methodologies
 - Multi-modal (e.g., text, image, video, audio) understanding and generation
 - Multi-lingual understanding and generation
 - Algorithms and workflows for acquiring and curating high-quality and diverse datasets for training
- **Foundation Model Evaluation**
 - Creation of new benchmarks for assessing foundation model capabilities
 - Methodologies for robust evaluation of generative AI systems, including agents
- **Efficient Generative AI**
 - Efficient training and inference for cloud and on-device applications
 - Compute and memory efficient handling of multi-modal long/infinite context
 - Improving efficiency of diffusion models, including discrete diffusion

- **Reasoning**
 - Commonsense and domain-specific (e.g., math, coding) reasoning
 - Temporal and spatial reasoning
 - Reasoning for planning
- **Knowledge Grounding**
 - Approaches to ground (multi-modal) generation on up-to-date world, domain-specific, enterprise, or personal knowledge
 - Memory-augmented generative AI systems
- **Agentic AI**
 - Creation of autonomous systems capable of performing tasks, making decisions, and interacting with their environments
 - Multi-Agent systems and agent orchestration framework improvements
 - Customization and continual improvement of agents post deployment
 - Internationalizing agentic systems
- **Responsible Generative AI**
 - Red teaming (e.g., advanced red teaming approaches, automated red teaming for multi-modal models)
 - Improvement of foundation model RAI performance (e.g., robustness to jailbreaking and membership inference attacks; watermarking approaches; deepfake detection)
 - Responsible agentic AI (e.g., robustness of multi-agent systems, adherence to guardrails)
- **Applications of Generative AI**
 - Systems that leverage Generative AI for advancing science and technology in areas such as physics, mathematics, chemistry, biology, hardware design, materials science, engineering, economics, healthcare, climate.

While the above topics are particularly of interest, highly meritorious nominations in other areas of ML and AI will also be considered.

Each selected Amazon fellow will receive

- \$24K stipend (academic year)
- Tuition will be covered
- Invitation to interview for an Amazon internship
- Travel support of \$1K to attend conferences in student's area of research

Fellowship Timeline

- April 18, 2025 (5pm EDT): Fellowship Nominations/Applications Due
- May 30, 2025: Fellowship Decisions Announced
- Aug 10, 2025: Fellowships begin in the Fall Semester
- July 31, 2026: Fellows must submit a brief report of their past year activities

Nomination materials

All nomination materials should be submitted in PDF format, single-spaced, 12pt font, one-inch margins by the Virginia Tech faculty member nominating the student for the fellowship. Nomination should include:

- Student's CV (2 pages maximum), with education, work experience, awards, publications, including link to his/her webpage;
- Student's personal statement (2 page maximum) including a description of their background, research so far, and further work that the fellowship will enable them to pursue
- Two letters of recommendation from Virginia Tech faculty members. One of these letters must be from the student's doctoral advisor.

Submission

Fellowship nominations should be submitted via this Google Form link: <https://forms.gle/54XvEcUUPqFcZqtG9>

Please fill out all the questions in the form before attaching the nomination packet. Any questions about nomination submissions should be addressed to Wanawsha Shalaby, Program Manager of the Amazon-VT initiative at amazon-vt@cs.vt.edu.

Review Criteria

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

- Statement
- Research experience/publication record

If you have any additional questions about the Amazon - Virginia Tech Initiative for Efficient and Robust Machine Learning or the fellowship nomination process, please refer to the following FAQ.