BOSCH

From
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Job Description

Description **Robot Learning Research Scientist / Engineer**

Company Description

The Bosch Research and Technology Center North America — with offices in Pittsburgh, Pennsylvania, Sunnyvale, California, and Watertown, Massachusetts — is part of the global Bosch Group (www.bosch.com), a company with over 70 billion euro revenue, 400,000 people worldwide, a very diverse product portfolio, and a history of over 125 years. The Research and Technology Center North America (RTC-NA) is committed to providing technologies and system solutions for various Bosch business fields primarily in the areas of Robotics, Human Machine Interaction (HMI), Energy Technologies, Internet Technologies, Circuit Design, Semiconductors and Wireless, and MEMS Advanced Design.

What we are looking for

The Robot Learning Lab at Bosch Research Pittsburgh is looking for talented people for investigations at the intersection of Robotics, Multimodal Machine Learning, Embodied AI, Computer Vision, and Natural Language Processing. We tackle challenging robotics and automation problems with large-scale industrial impact, while simultaneously making methodological advances in the robot learning scientific community. Our goal is to develop autonomous systems that learn safe, robust, generalizable, and transferable representations of the world and are therefore capable of acquiring, adapting, and improving their own skills/behaviors when deployed to diverse scenarios. We believe that robotics systems require these properties to be deployable to the real world, so that they can augment or work alongside humans and other agents.

Our robotics R&D topics include:

- Dexterous, contact-rich, and deformable object manipulation.
- Post-training, distilling, and adapting robot foundation models.
- Cross-embodiment transfer representation learning.
- Online, self-improving agentic robot decision frameworks.
- Human/robot data collection systems and methods for data-curation.

In this role, you will:

- Work with colleagues to design, build, and instrument robotics testbeds
- Setup new robot hardware, writing interfaces to existing data-collection / robot control / model training / model deployment stacks

- The candidate is expected to display independence and maturity as a researcher by: formulating compelling scientific research problems, performing rigorous literature reviews, designing and executing experimental plans, extracting salient insights from the experimental results, and working with colleagues to publish academic manuscripts, technical reports, and industrial patents
- Build robotics prototypes and solutions, then deploy these solutions to production facilities

To be successful, we expect candidates to have experience in dealing with challenging problems in multimodal machine learning, transfer representation learning, and robot learning, including:

- Learning safe, robust, or generalizable robot state representations.
- Designing useful regularization objectives for optimizing robot policies.
- Adapting or transferring representations across different domains (e.g., different embodiments, diverse environments, sim-to-real contexts, diverse tasks and objects, etc.).
- Dealing with the practicalities related to implementing neural policies, e.g., non-convex optimization "tricks" and multi-machine/multi-GPU parallelized training of large models.
- Conducting careful model performance characterization and error analyses, e.g., determining informative ablations and baselines, inspecting and visualizing learned representations, identifying dataset biases.
- Using closed- and open-source Vision-Language foundation models, e.g., for perception, planning, world-modeling, progress-monitoring, or control.
- Understanding the nuances of curating and combining data from various sources, to effectively post-train robot foundation models.

Required Qualifications

- Ph.D. in Computer Science, Robotics, Machine Learning, or a relevant area of study; or M.S. degree, with 3-5 years of post-degree professional experience.
- Strong backgrounds in Machine Learning and Robotics, with emphasis on multimodality and/or representation learning

Preferred Qualifications:

- Extensive experience in from-scratch development of neural policy data-ingest, training, and deployment pipelines.
- Extensive experience in implementing, training/fine-tuning, and evaluating the performance of RL/BC policies; familiarity with high-performance computing (HPC) systems and job schedulers (e.g., slurm).
- Extensive experience in leveraging Vision Language Models and/or Vision Language Action models.
- Extensive experience in training neural models on multi-machine or multi-GPU setups.
- Extensive experience in working on robot hardware platforms.

- Extensive publication history in top conference venues.
- Experience leading projects with small teams, demonstrating the ability to mentor junior researchers and interns, manage project timelines, and deliver results within time constraints.