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starting at 10:00AM

Vandal Lab, Covivio - Corso Ferrucci 112
Turin, Italy

Robots Learning and Acting Safely in the Real World

Thanks to Machine Learning, robots can solve increasingly complex scenarios. However, applying reinforcement learning to real-world environments is still extremely challenging, particularly when we want to learn directly on the platform. Differently from simulated scenarios and tabletop games, the real-world challenges prevent a naive application of Reinforcement Learning techniques for real robots.
Unfortunately, to achieve this goal, many practical problems need to be solved: safe and efficient exploration, robustness to perturbations and environmental conditions, and sample efficiency.
In this talk, we will discuss the crucial issues of Robot Learning, focusing in particular on how to act and plan under safety and task constraints.

We will present ATACOM, a Safe Reinforcement Learning framework that ensures the algorithm will sample only safe actions, by forcing the agent to act on the tangent space of the constraint manifold. Then, we will show some techniques to learn robustly and efficiently.

Davide Tateo is a postdoctoral researcher and Safe and Reliable Robot Learning Research Group Leader in the Intelligent Autonomous Systems group at TU Darmstadt, Germany. Davide joined the lab in April 2019 after receiving his Ph.D. in Information Technology from Politecnico di Milano (Milan, Italy) in February 2019. The main goal of his research group is to develop learning algorithms that can be deployed on real systems. To achieve this objective, the group focuses on fundamental properties of the learning algorithm, such as acting under (safety) constraints.