Robotics MVA 2025–26 Final exam articles

Format: you (= your team of 2 students) read and report on a research paper from the following list.

Note that we expect you to go *beyond* just reading and summarizing a paper. We encourage you to be critical of the work and creative. For instance, **try to reproduce the method** (re-implement, test an algorithm in simulation, ...) to identify its shortcomings or limiting assumptions, try variations of the method, propose next steps to overcome limitations, etc.

- Approximating Robot Configuration Spaces with few Convex Sets using Clique Covers of Visibility Graphs
  - Related lectures: motion planning
- Collision Detection Accelerated: An Optimization Perspective
  - Example of outcome: your own implementation of the GJK algorithm in 2D
  - Related lectures: motion planning, optimal control
- Estimating 3D Motion and Forces of Person-Object Interactions from Monocular Video
  - Related lectures: perception and estimation, optimal control
- Legged Locomotion in Challenging Terrains using Egocentric Vision
  - Related lectures: reinforcement learning, perception
- Object Goal Navigation with Recursive Implicit Maps
  - Hints: reproduce results with the released codes and checkpoints; visualize and analyze failure cases; train and evaluate a model on a few scenes
  - Related lectures: motion planning, reinforcement learning
- Proximal and Sparse Resolution of Constrained Dynamic Equations
  - Example of outcome: simulator prototype with bilateral constraints
  - Related lectures: optimal control
- Robust Recovery Controller for a Quadrupedal Robot using Deep Reinforcement Learning
  - Related lectures: reinforcement learning, motion planning
- Temporal Difference Learning for Model Predictive Control
  - Related lectures: optimal control, reinforcement learning
- Towards Generalizable Vision-Language Robotic Manipulation: A Benchmark and LLM-guided 3D Policy
  - Hints: reproduce the results with the released codes and checkpoints; visualize and analyze the failure cases; train on the most challenging tasks
  - Related lectures: configuration space
- Train-Once Plan-Anywhere Kinodynamic Motion Planning via Diffusion Trees
  - Related lectures: motion planning
- ViViDex: Learning Vision-based Dexterous Manipulation from Human Videos
  - Hints: your can re-implement object relocation in Python
  - Related lectures: configuration space, reinforcement learning

If you find another article that piques your curiosity, e-mail us about it!