

Advanced Robotics – Dynamic Movement Primitives Workshop

The objectives of the workshop are to:

- Use the provided code to apply Dynamic Movement Primitives (DMPs) on various trajectories.
- Generate plots of trajectories for the same demonstration, that start from various states.
- Investigate the impact of the number of Radial Basis Functions (RBFs) on the generated trajectory and the error on the forcing term by creating appropriate plots
- Find the optimal number of RBFs for each demonstrated trajectory
- Illustrate and comment on the relationship between the complexity of demonstrated trajectory and the optimal amount of RBFs

The provided code is a python implementation of DMPs. Have a look at the given code and the example in the examples folder. The file *workshop.py* contains a template to help you begin the task. The folder *demos* contains four 2D trajectories of various complexity. The most useful functions are the following:

- `pydmps.dmp_discrete.DMPs_discrete` : the constructor of the DMP object. The number of DMPs, the number of RBFs and the starting point of the trajectory can be set here.
- `Imitate_path()`: this method trains the DMPs and returns the forcing term of the demonstration
- `Rollout()`: This method generates the trajectory learned from the demonstrated motion (positions, velocities and accelerations) and returns the learned forcing term