Project

In our previous works [1],[2],[3] we characterized the equilibria of the time-inverted Kuramoto model with a ring topology. By exploiting the properties of the equilibrium configurations, we used the time-inverted Kuramoto dynamics for persistent monitoring and target detection applications. However, there are questions that still remain without an answer: given a random initial condition, and assuming that we can control n_c robots, is it possible to steer the final equilibrium configuration in a desired equilibrium configuration? How many robots should we control to achieve this goal? Is it possible to learn an optimal/sub-optimal policy that allows to do that?

[1] M. Boldrer, F. Riz, F. Pasqualetti, L. Palopoli and D. Fontanelli, "Time-Inverted Kuramoto Dynamics for κ-Clustered Circle Coverage," 2021 60th IEEE Conference on Decision and Control (CDC)

[2] M. Boldrer, F. Pasqualetti, L. Palopoli and D. Fontanelli, "Multiagent Persistent Monitoring via Time-Inverted Kuramoto Dynamics," in IEEE Control Systems Letters

[3] M. Boldrer, L. Lyons, L. Palopoli, D. Fontanelli and L. Ferranti, "Time-Inverted Kuramoto Model Meets Lissajous Curves: Multi-Robot Persistent Monitoring and Target Detection," in IEEE Robotics and Automation Letters