LEARNING RIGIDITY-BASED FLOCKING CONTROL WITH GAUSSIAN PROCESSES

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Flocking control algorithms have gained much attention in the recent years due to the increasing amount of mobile and aerial robotic swarms. In this talk, an strategy was proposed to overcome the inability of a typical control law to adjust by itself to different situations. The method introduced to face this challenge consists of the incorporation of Gaussian Processes (GP) into control design problems.

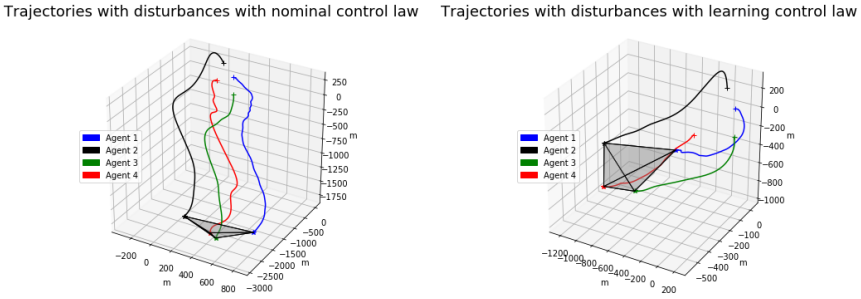

FIGURE 1. Left: Nominal control law / Right: Learning control law

GPs are a valuable tool to improve classical control laws if we perform regression with them, together with the use a Bayesian approach to train and make predictions. With this strategy, new control laws can be designed to be more robust in front of external unknown forces and offer, at the same time, safety guarantees with probability bounds for predictions about the error in the proposed method.

This online approach allows us to deal with flocking behaviour (see Reynolds in [1]) under partially unknown disturbances: `https://youtu.be/VeLE-qgTJVA`.

REFERENCES

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