

Lab 4
Coordinated and Collective
Movements

Cyrill Baumann

25.03.2021

What this lab is about

1- Reynolds flocking

- (a) No specific formation geometry
- (b) No leader (usually a migration rule)

2- Robust formation control

- (a) Specific formation geometry
- (b) Leader to move the formation

3- graph-based formation control

Reynolds flocking in Webots

- You will study the impact of various parameters on the flock.
- Three different localization systems:
 - Absolute and centralized localization.
 - Odometry (motion model propagation).
 - Range and bearing.
- The performance is just an estimate (not very reliable).

Robust formation control in Webots

- The leader is controlled by your arrow-keys.
- Note the differences between flocking and formation.

Graph-based formation in Matlab

- No leader in this case.
- Try to understand how the Laplacian controller works.
- Play with the parameters and note their effects.

Notes

- The lab is a bit long, but you have 4h !
- **Remember to fill the feedback form**