Swarm Systems CMP 756 - HW2. Due:20.04.2022 / 23:59

Consider $\dot{x}_i = u_i$ where $x_i \in \mathscr{R}^2$ for $i = 1,...,10$. And assume that agents are modeled as a point mass, there is no time-delay, agents can move simultaneously and all agents know the exact positions of each other. Then, build a simulation (preferable in Matlab) to show

1. Assign random initial states (x_i) to every agent in a bounded region,
2. Design $J(x)$, $g(x)$ for aggregation problem,
3. For the steady-state, define the radius of the hyperbola for the convergent area,
4. Validate Theorem I-II and Lemma I of the reference book,
5. Plot initial positions and final positions of every agent by tracking the path on a single graph,
6. Discuss the results
7. Send figures in .jpg format and a separate ready-to-run simulation code.