

Multi-Instance Task in Swarm Robotics: Sorting Groups of Robots or Objects into Clusters with Minimalist Controllers

(Supplementary Material)

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In this supplementary material:

- Expanded series of snapshots of the emergent behavior for:
 - Aggregation case Fig. 1;
 - Object Clustering Fig. 2;
- Dynamics of the dispersion of the elements of interest (robots or objects) in the scalability experimentation:
 - Aggregation case Fig. 3;
 - Object Clustering Fig. 5;
- Dynamics of the proportion of clustered elements of interest (robots or objects) in the scalability experimentation:
 - Aggregation case Fig. 4;
 - Object Clustering Fig. 6;

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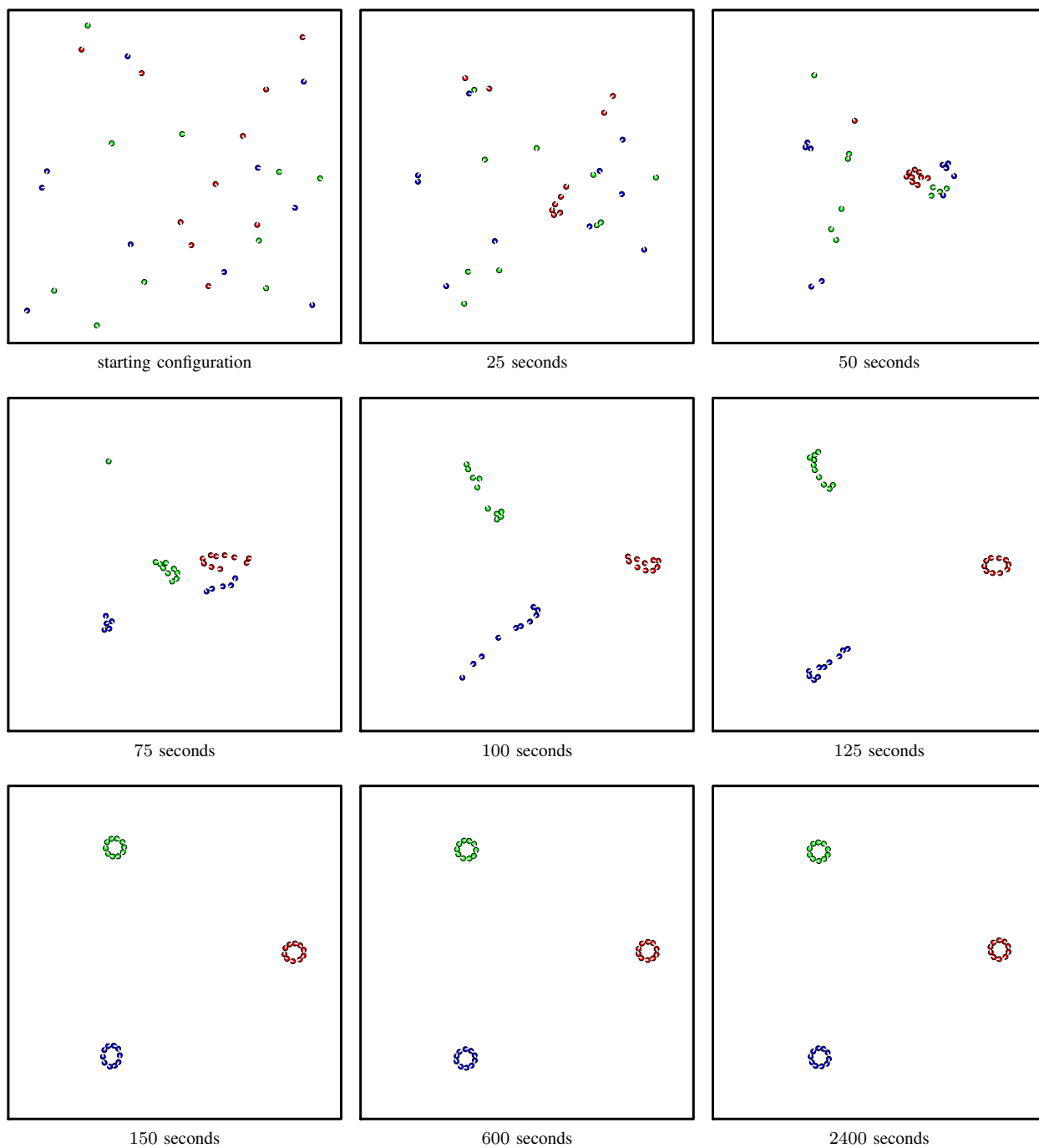


Fig. 1. Series of snapshots of the emergent behavior of controller \bar{v}_2 where 30 robots sort themselves into 3 groups.

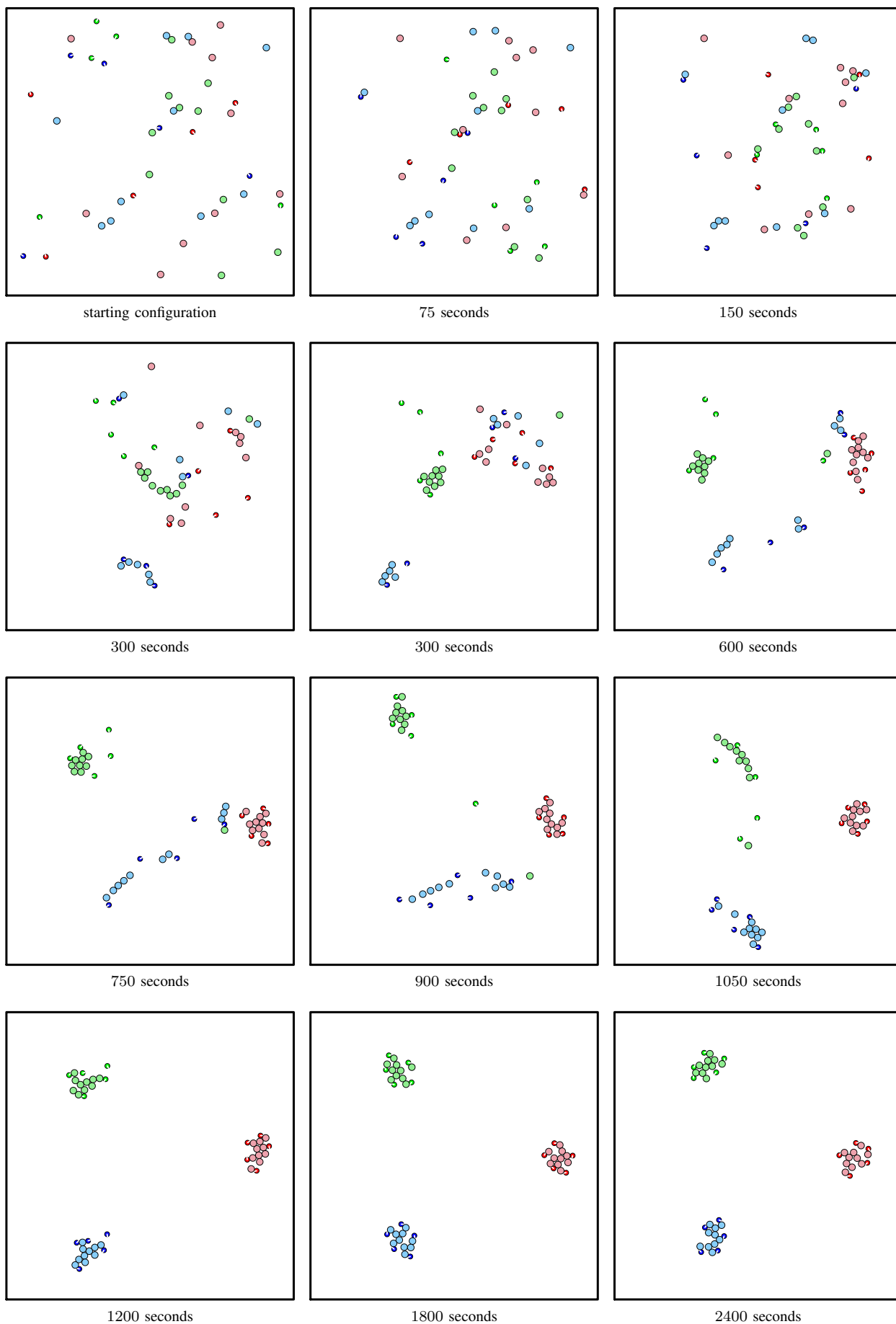


Fig. 2. Series of snapshots of the emergent behavior of controller \bar{v}_4 where 15 robots sort 30 objects into 3 groups.

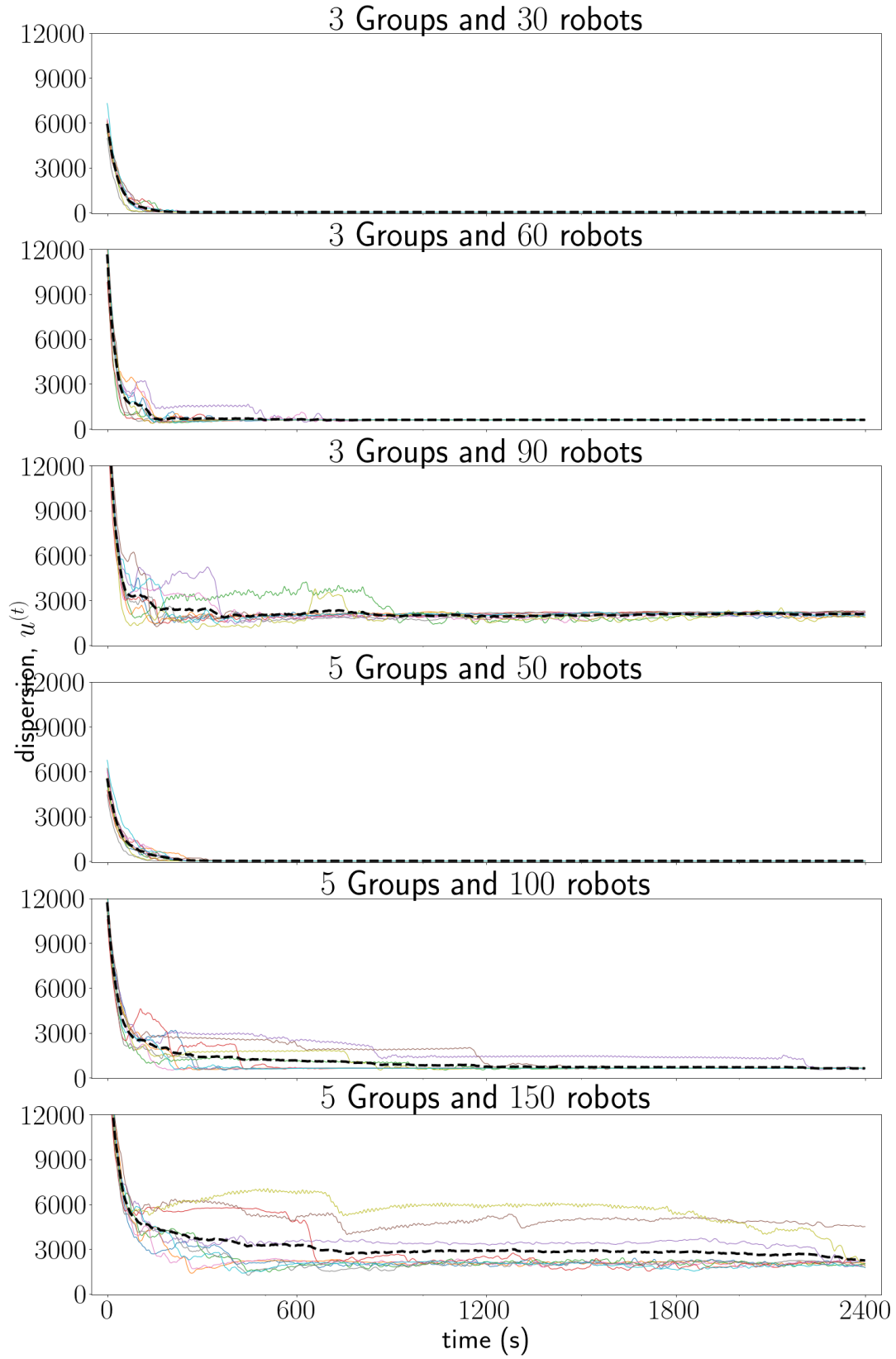


Fig. 3. Dynamics of the dispersion of robots in the scalability experimentation by time. Each plot has a particular configuration in terms of the number of groups and robots. The black dashed line represents the average dispersion from the 10 trials. The dispersion for each trial are represented by thinner continuous lines.

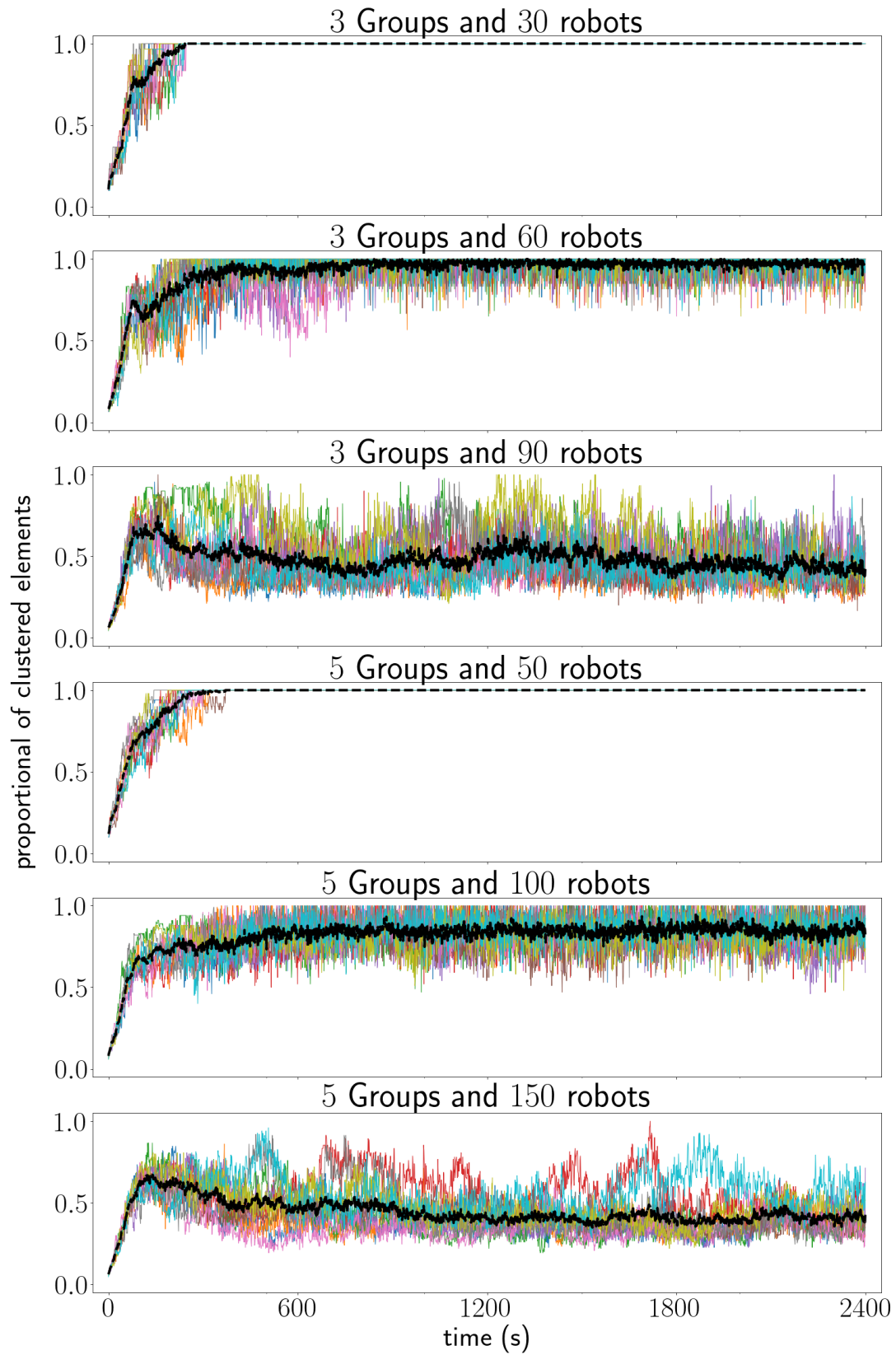


Fig. 4. Dynamics of the proportion of clustered robots in the scalability experimentation by time. Each plot has a particular configuration in terms of the number of groups and robots. The black dashed line represents the average proportion of clustered robots from the 10 trials. The proportion of clustered robots in each trial is represented by thinner continuous lines.

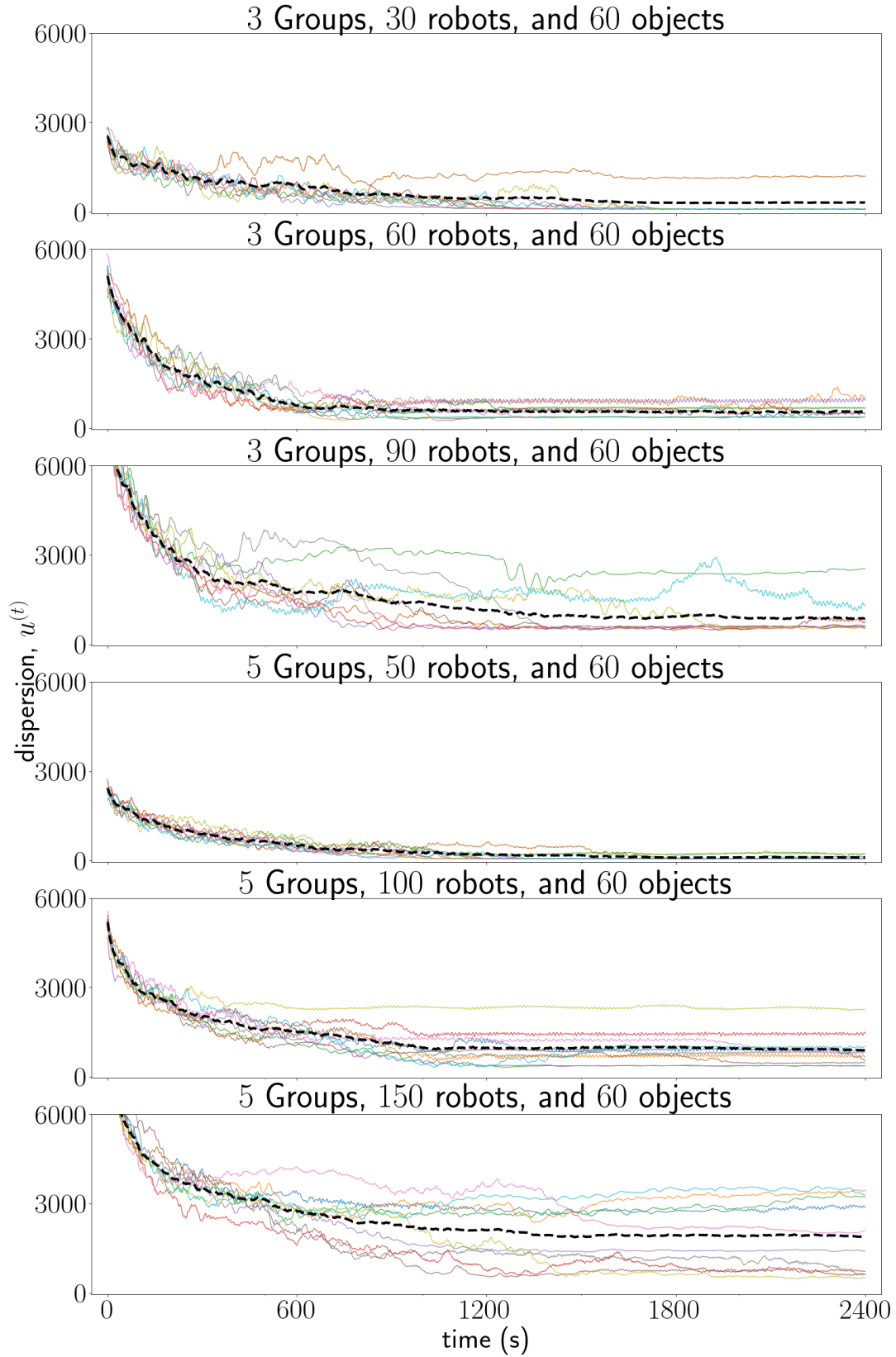


Fig. 5. Dynamics of the dispersion of objects in the scalability experimentation by time. Each plot has a particular configuration in terms of the number of groups and robots, the number of objects is fixed. The black dashed line represents the average dispersion of the objects from the 10 trials. The dispersion for each trial are represented by thinner continuous lines.

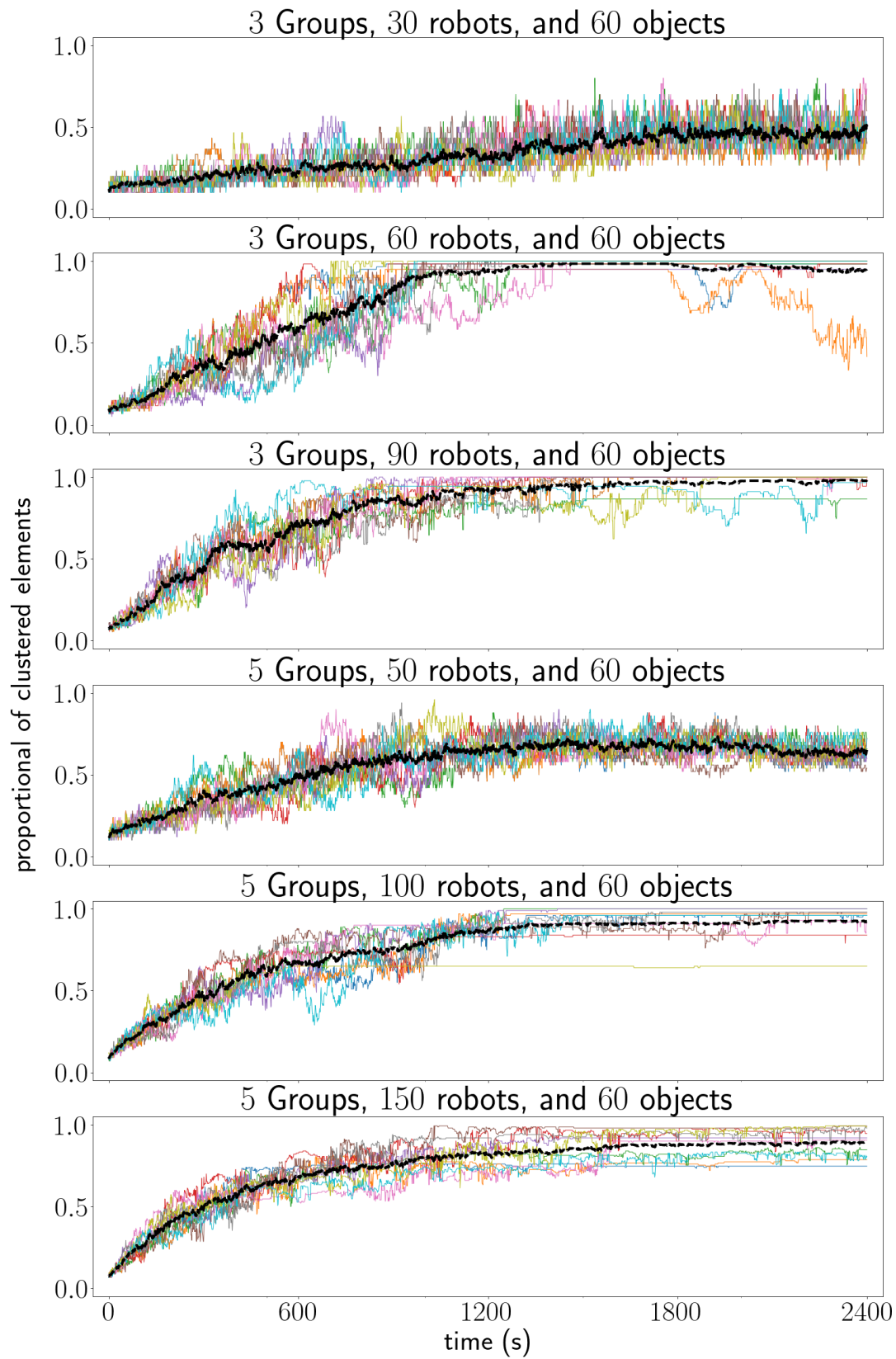


Fig. 6. Dynamics of the proportion of clustered objects in the scalability experimentation by time. Each plot has a particular configuration in terms of the number of groups and robots. The black dashed line represents the average proportion of clustered objects from the 10 trials. The proportion of clustered objects in each trial is represented by thinner continuous lines.