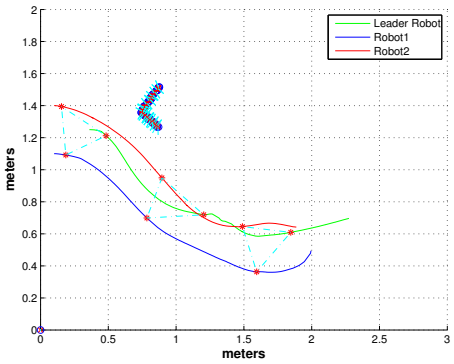
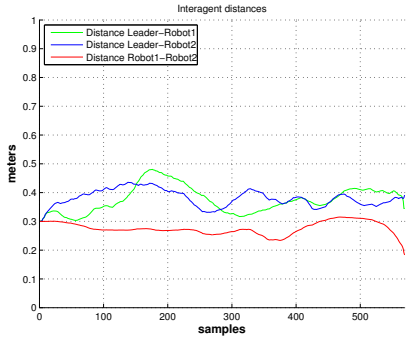
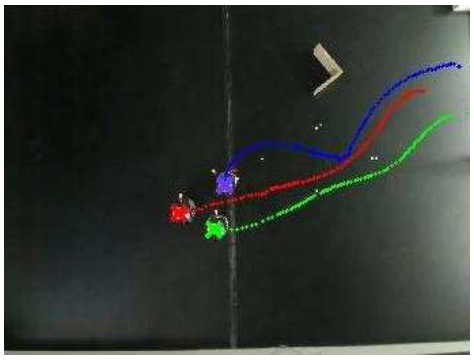


(a) Paths of the robots

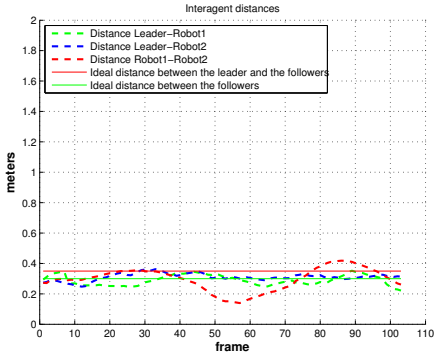


(b) Inter-agent distances

Fig. 4. Paths and inter-agent distances.



(a) Paths of the robots



(b) Inter-agent distances

Fig. 5. Paths and inter-agent distances.

VII. Conclusions And Future Works

In this paper, the idea of using potential flow field calculated by the panel method in real-time for robot navigation is presented in real experimental setup. We use a leader-based strategy for navigating the swarm of robots. Potential functions are also used to set the inter-agent forces acting between the robots resulting in the formation a predefined geometrical shape. While the leader uses streamlines to find its way to the target, the follower robots update their positions so the general form of the swarm is not broken. The algorithm is tested successfully in laboratory environment giving optimistic results. To overcome the increasing computational complexity in densely populated environments one can use separate dedicated processor for panel calculations. The algorithm can be used in dynamic environments as well.

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