



PSO ALGORITHM FOR SINGLE AND MULTIPLE ODOR SOURCES LOCALIZATION PROBLEMS: PROGRESS AND CHALLENGE

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Abstract- Odor sensing technology in robotic research introduce two research field namely odor recognition and odor source localization. Odor source localization research also includes the odor recognition ability with localization method. This paper shows some experiment had been done to localize odor source using single agent and multiple agents. Experiment shows that single agent can't be used in dynamic environment, hence also can't be used in real life application. This paper promotes an algorithm known as Particle Swarm Optimization (PSO) to solve these problems. The experiment

conducted using PSO shows that PSO able to localize the odor source in the same condition where single agent failed. However, PSO still need to be modified before it can be use widely. This paper shows modification that has been proposed by the authors to enhance it's ability. The research also has been push to solve multiple odor sources using parallel localization. To verify proposed method, software simulator was used. Results from these experiment show that Modified PSO is able to localize all four odor sources in dynamic environment in 651.900 seconds within 7 x 7 meters search area. The modification being applied in this research not limited by searching technic but also creating two types of robot.

Index terms: Particle Swarm Optimization, PSO, Modified PSO, Odor Source Localization, Al-Fath, Multiple Odor Sources Localization, Multiple Robots, Dynamic Environment, Parallel Localization