



MODIFICATION OF PARTICLE SWARM OPTIMIZATION BY REFORMING GLOBAL BEST TERM TO ACCELERATE THE SEARCHING OF ODOR SOURCES

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Abstract- Particle Swarm Optimization (PSO) has been widely utilized for Odor Source Localization (OSL) purposes. There have been plenty of researches on this field. The latest research to modify original PSO were on the utilization of wind dynamics. In wind utilization research, the robot movement would be retarded if the robot movement direction is similar to the wind direction. Conform to the aforementioned method, this research proposed new modification on the global best term of PSO algorithm. There are two modifications proposed in this research, named Ignoring gBest 1 (IgB1) and Ignoring gBest 2 (IgB2). The basic concept of two proposed methods are identical by considering wind dynamic into global best term of PSO. The robot which in the original PSO will move to global best position would be deviated to the other point which is defined by deliberating wind direction. The main difference of both the method lies on the addition of new term in IgB1, whereas in IgB2 there is modification in social term without any additional term. The experiment was conducted on two PSO

for OSL purposes algorithms i.e. Ranged Sub-Group PSO (RSPSO) and Ranged Multi Niche PSO (RMNPSO). The result on RMNPSO showed significant decrease in time consumption while employing both the proposed method. On the contrary in RSPSO the improvement is insignificant compared to the original algorithm.

Index Terms: Particle Swarm Optimization, odor Source Localization; wind dynamic, Ignore gBest 1, Ignore gBest 2, time consumption