

Multiple Mobile Robot Surveillance (Prof. J. Ota and Prof. T. Arai)

This research aims to deal with the fundamental problems that arise in surveillance missions for multiple mobile robots, where the shortest cyclic path of the robots is aimed as a result of the iterative operation.

In this task setting, robots are first sent out in an exploration phase by distributed sensing at observation points and complete coverage strategy using the Reaction-Diffusion Equation on a Graph (RDEG)-based surveillance planner. In surveillance mission it requires the iterative search of events over and over in the target environment. In the iterative operation, the robots monitor their individual coverage areas and update their local maps to account for environmental changes. In order to quickly respond to such changes, the observation points are dynamically assigned to the robots. The assignment is made by utilizing the proposed real-time task assignment planner.

Keywords: multiple mobile robots, surveillance, task allocation

References

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- 2) Trevai C., Ota, J. and Arai, T., Self-organizing Planner for Multiple Mobile Robot Exploration and Patrol, Eds. Arai,T., Pfeifer,R., Balch,T. and Yokoi,H., IOS, Intelligent Autonomous Systems 9, 622/631 (2006).

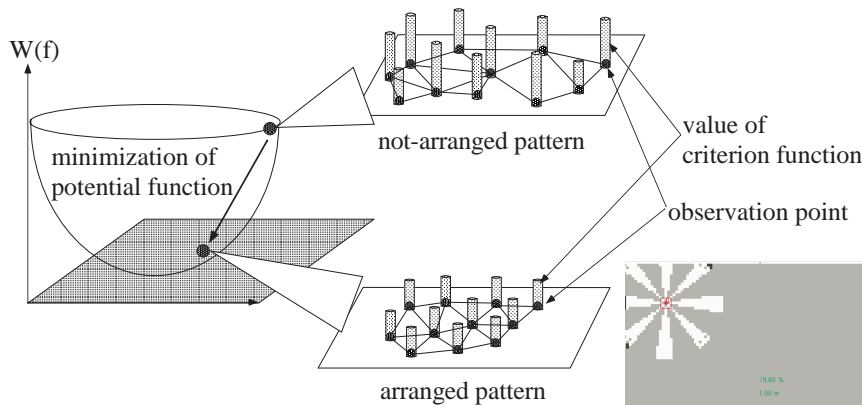


Fig. 1 Arrangement of Observation Points

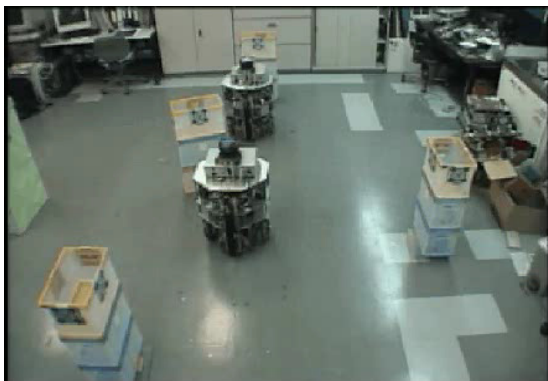


Fig. 2 Surveillance Task Realization by Real Mobile Robots

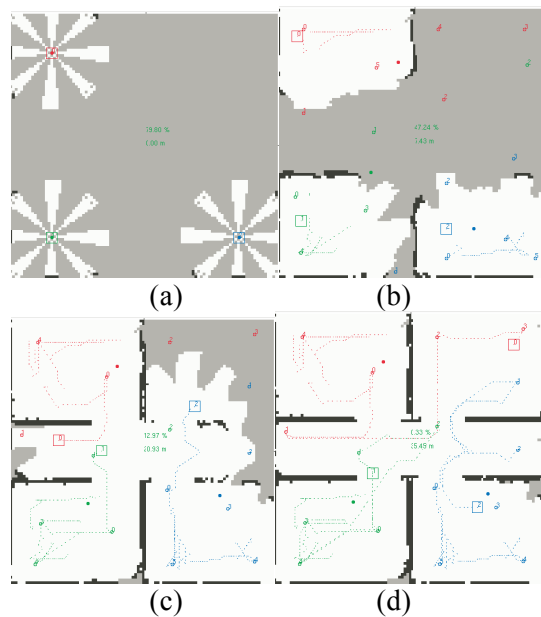


Fig. 3 Simulation Results of Three Robot Surveillance Task Realization