Cooperative Search after Targets by Group of Robots

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Abstract: The work considers the detection of multiple targets by a group of mobile robots (agents) that perform under uncertainty. Real world applications of the proposed scheme are smart-cities low-enforcement agents, autonomous taxis, crowed agriculture drones, pipeline inspection robots and more. These agents are equipped with sensors for detecting targets at different distances. The goal is to define the trajectories of the agents that can lead to the detection of the targets in minimal time. The suggested solution follows AI-based search methods, such as reinforcement learning, that are based on information-theoretic criteria. Sensor fusion in each agent and over the agents is implemented using a general Bayesian update scheme. Several proposed methods are compared and analyzed using various numerical simulations.

Joint work with **Barouch Matzliach and Evgeny Kagan**

Bio:

Prof. Irad Ben-Gal is the head of the Laboratory of AI & Machine Learning at Tel Aviv University.
Irad is a world-renowned expert in machine learning, data science and predictive analytics with more than 25 years of experience in the field, including close R&D collaborations with companies such as Oracle, Intel, GM, AT&T, Applied Materials and Nokia.
Prof. Ben-Gal wrote four books, published more than 150 scientific papers and patents, supervised dozens of graduate students and received numerous awards for his work. He held a visiting professor position at Stanford University, teaching graduate courses in analytics and co-heading the TAU/Stanford "Digital Living 2030" research initiative. Irad is a co-founder and the chairman of CB4 ("See Before"), a startup backed by Sequoia Capital that provides AI solutions to retail organizations. He is an advisory board member in several startup companies that focus on AI applications.