Search and Task Allocation

Swarm Intelligence

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1 Formalism

We define a search A as an area bound by two points. Over the search area, n_T tasks T are spawned at random positions. The tasks have a task capacity T_c indicating how many agents R are required to solve a task. The task is solved immeadeately if T_c agents are within the task radius T_r. The agents R move randomly around the search area at a speed R_v. There are n_R agents. When an agent is inside the task radius T_r of a task, the agents will wat for other agents to complete the task. The agents can also call for aid in solving a task. The communication distance R_d determines how far an agent can send a call for aid to another agent.

2 Simulations

We implement a tool for visualising the problem described above, in 'PyGame'. The full implementation is available at `github.com/gregwinther/mas`.