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Proposal for Hydrocarbon Remote Sensing Simulation

Oil spills are a constant threat to ocean and land ecosystems. Early detection is the key to quick response and clean-up. Quick detection is possible near land masses and populated areas, but oil spills in less frequented areas are near impossible to detect. While it would take a massive amount of man hours and money to monitor some of these areas, robots could easily be dispatched to keep a constant watch on a given area, such as an often used shipping lane.

A swarm of robots could be used to efficiently determine the size of a large oil spill, though communication between hundreds or thousands of robots over unknown distances is not necessarily feasible. This means having robots that can communicate with their immediate neighbors and make decisions based only on that local information that they can collect.

I plan to create a simulation of a robot swarm that can detect an ‘oil spill’ in a given area. The swarm will converge on any single robot that detects oil and fan out to evenly and constantly track the perimeter of the spill. The simulation will be implemented in C# to ensure portability.