

# Seismic Surveing with Heterogeneous Robotic Swarms

## Research Themes

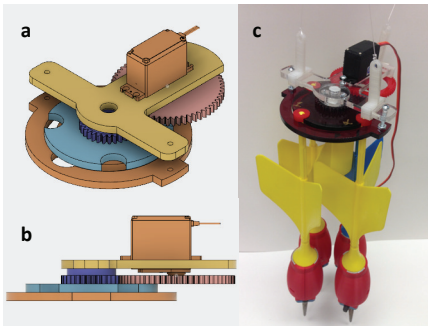
Seismic surveying requires placing a large number of sensors (geophones) in a grid pattern, triggering a seismic event, and recording the propagating waves. The location of hydrocarbons is inferred from these readings. Traditional seismic surveying employs human laborers for sensor placement and retrieval. The major drawbacks of surveying with humandeployment are the high costs and time, and risks to humans due to explosives and harsh climatic conditions. We propose an autonomous heterogeneous sensor deployment system using UAVs to plant immobile sensors and deploy mobile sensors.

## Recent Accomplishments

- We demonstrated and recorded the world's first automated seismic survey
- Published two conference papers at SEG and CASE
- Submitted a journal paper at RA-L

## Issues

Initially we had problems with the deployment system i.e. the UAV. The primary design consisted of a commercial UAV. The sensors(geophones) consisted of magnets that interfered with the UAV's internal compass thus causing problems with localization. We assembled a hexacopter which increased our payload capabilities and the access to place the GPS far away from the sensors. This also led to the heterogeneous sensors that could be deployed from the hexacopter since our payload increased.



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