Heterogeneous Robotic Large-Scale Seismic Sensing

Srikanth K. V. Sudarshan[1], Victor Montano[1], Li Chang[2], Robert Stewart[2], and Aaron T. Becker[1]

[1]Department of Electrical and Computer Engineering
[2]Department of Earth and Atmospheric Sciences
University of Houston
4800 Calhoun Rd, Houston, TX 77004
{skvenkatasudarshan, lhuang21, lchang13, rrstewar, atbecker}@uh.edu

***Abstract*—**

I. Introduction

Seismic Sensing

II. Overview and Related Work

A. Seismic Sensing

B. Sensor networks

C. Multi-Robot Assignment

III. SmartDarts

A. Design

Exp 1: Drop tests as function of height, compare twisted vs straight tail, depth and angle
Exp 2: Drop tests as function of soil type, compare twisted vs straight tail, depth and angle
Exp 3: Automatic drop from drone, accuracy in placement
Exp 4: Dart sensing accuracy vs ground setup
Exp 5: Data transmission (what plot can we make for this?)
Exp 6:

IV. SeismicSpider

A. Design

Exp 1: Drop test
Exp 2: Hexapod move to desired GPS location (plot accuracy)
Exp 3: Hexapod sensing accuracy vs ground setup
Exp 4: Data transmission (what plot can we make for this?)
Exp 5: Retrieving Hexapod

V. DeploymentUnit(UAV)

A. Design

Task Allocation Theory : I want to explore how to assign k smart darts, m hexapods, and n drones (k=500,m=20, n = 10). How should we assign them? What changes as k,m,n shift? Can we write this as a linear program? Can we reuse Srikanth's old code, but adapt it for 3D topology?

VI. Conclusion