CONNECT

Cooperative Node Network Command Test
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Today’s Presentation

1. Our Mission
2. Current Progress
3. Next Steps
4. Q & A
“Going to Space, Together.”
How will it work?

Our goals:

- reduces cost
- lowers barriers to entry
- promotes user-friendliness
- enables new types of missions
- supports existing community
Affordability

Preaching to the choir, a.k.a.
Lowering Barriers to Entry

Open-source licensing
Code publication
Collaborative design on our (in development) Platform
Lowering Barriers to Entry - with our Platform
Ease of Use

To transform mission control from this... ...
...to this

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Enabling New Mission Types

Inspections

Prospecting

Support
Supporting Existing Community

Enthusiasts & students

Scientists & other professionals

Photo credits: Thuvt, 27 Nov 11

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Current Progress
Step 1: Simulate

Physics: Anaconda distribution of Python 2.7
Models: Autodesk Inventor
Animation: Unity
Data Output: csv

```python
def dodge(Ship, satList, satAtts, targetID, t_step):
evasionVector = dodge_vector(Ship.attitude, 
   (Ship.pos - 
    satList[targetID].pos))
Ship.reorienting(t_step, evasionVector)
satAtts[Ship.ident, :] = Ship.attitude
if closelyAligned(Ship.attitude, evasionVector):
    Ship.thrust_state = True
    Ship.burning(t_step)
```
Fundamental Swarm Rules

- Collision avoidance
- Maximum swarm diameter
- Minimum allowable swarm distance
Physics: Hill-Clohessy-Wiltshire

Pros:

1. Conceptually simpler
2. Faster computation
3. Local linearity
4. Flexible to future perturbation models

Cons:

1. Long-term error
2. Limited to operations in gravity wells
Step 2: Estimate

Assume: all current COTS hardware and software

Primary focus on:
- Movement
  - propulsion
  - attitude control
- Communications
  - inter-drone
  - ranging/remote sensing
- Command input
Step 3: Iterate
Step 4: Grow

Are you passionate about living in space and cooperation? The following experts are highest in demand for our immediate trajectory:

- Space Mission Engineers
- Software Developers
- Interaction Designers
- ITAR Compliance

Please talk with me afterwards, email curious@space.coop, or visit www.space.coop/membership for more details!
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Q & A