



HASP 2018 Monthly Status Report

Report Month: JANUARY 2018
Submitted by: Jimmy Acevedo
Submit Date: 01 / 29 / 2018
Institution: The Unacceptable Risks / Durham Tech
Payload Number: 2018-11
Payload Name: Robotic Arm Manipulation and Materials
Matching: RA(M³) or RAM

I) Activities During Previous Month:

- Revised initial arm design to a simpler layout using fewer parts and cheaper/better materials (U-channel and CotS brackets rather than sheet stock and home-bent angle brackets.) We also removed 1 degree of freedom (DoF.)
- Revised initial gripper to a more robust, easily-manufactured design.
- Started welding together frame.
- Purchased initial supply round.
- Recruited a senior aerospace engineering student from NCSU.
- Raised \$2,200 from local businesses.
- Secured an additional \$5,000 in funding matching (from Durham Tech) by crowdfunding one of our sister projects, freeing up a shared grant for us.
- Begun coding overall network master.
- Wired up simpler components (cameras, switches, buttons) and wrote code to support them.
- Built prototype 'Busy Box'.
- Modeled our CotS robot arms in Denavit-Hartenberg parameters.
- Based on computer vision testing, we have decided to move away from color recognition and will focus on edge detection aided by AprilTag "fiducials."
- Built a development desktop ("FrankenBox") out of spare donated parts for access to Ubuntu/Windows development environments, particularly for ROS simulator software RViz and MoveIt!
- Built a new website. www.theunacceptablerisks.com
- Visited the Satellite Servicing Projects Division (SSPD) at Goddard in December to better understand the state of the industry.

II) Issues Encountered:

- Keeping the team staffed may be an issue. We're working on additional recruitment and solidifying current commitments.
- Snow days and school closures, along with production delays, have us further behind than we want to be.

III) Milestones Achieved:

- Accepted to HASP!!!!!!!!!!!!!!!

IV) Plans for Coming Month:

- Move into crunch time for prototype production.
- Run initial systems test of code in simulation.
- Test individual components (cameras, RPi, etc.) in vacuum (and maybe in cryo/bake.) We've determined that the PixyCam isn't sufficient for our purposes and will require a significant redesign, so we're shopping for other cameras (specifically, a 720p camera that is space-proven that plays well with the RPi.)
- Make t-shirts!
- Respond to initial comments on our application.
- Re-visit SSPD's "industry day" technology showcase on 30 Jan 2018.

V) Other Comments:

- Thanks for having us back!

VI) Team Composition and Organization:

Name	Start Date	End Date	Role	Student Status	Race	Ethnicity	Gender	Disabled
Jimmy Acevedo	10 Oct 2017	Present	Student Team Lead	Undergrad	White	Hispanic/Latinx	Male	No
Daniel Daugherty	10 Oct 2017	Present	Mechanical Engineering	Undergrad	White	Non-Hispanic/Latinx	Male	No
Daniel R. Koris	10 Oct 2017	Present	Electrical & Software Lead	Undergrad	White	Non-Hispanic/Latinx	Male	No
Munir Sultan	10 Oct 2017	Present	Electrical Engineering Consultant	Undergrad	Asian	Non-Hispanic/Latinx	Male	No
Kieran Valakuzhy	10 Oct 2017	Present	Electrical Engineering Consultant	Undergrad	Asian	Non-Hispanic/Latinx	Male	No
Noah Olson	10 Oct 2017	31 Jan 2018	Engineer	Undergrad	White	Non-Hispanic/Latinx	Male	No
Meredith Murray	10 Oct 2017	Present	Documentation & Social Media	Undergrad	White	Non-Hispanic/Latinx	Female	No
Laura O'Brien Hagman	10 Oct 2017	01 Jan 2018	Documentation	Undergrad	White	Non-Hispanic/Latinx	Female	No
Spencer Boyd	10 Oct 2017	Present	Machinist Consultant	Undergrad	White	Non-Hispanic/Latinx	Male	No
Landon Fernandez	05 Jan 2018	Present	Aerospace Engineering	Undergrad	White	Hispanic/Latinx	Male	No
Sean Austin	15 Nov 2017	15 Jan 2018	Software	Undergrad	White	Non-Hispanic/Latinx	Male	No
Soham Pai Kane	15 Dec 2017	Present	Software	Undergrad	Asian	Non-Hispanic/Latinx	Male	No