Multidisciplinary Senior Design
Project Readiness Package

Prepared by G.Werth on July 6, 2018

Project Title	ATLAS Upgrade
Project Number	P19319
Primary Customer	Lockheed Martin Owego
Sponsor	Jim Melby
Faculty Champion	[Assigned by MSD]
Other Support	Sean Begley
Project Guide	G.Werth
IP Considerations	All IP retained by Lockheed

Project Information

Overview

This project is a follow-on to the 2017-2018 MSD ATLAS project which created a robotic arm testing device for screening complex touch displays. Moreover, there have been several modifications identified for effective application of this device including the addition of a camera, smaller footprint, cycle time reduction, and miscellaneous hardware cleanup and software interface adjustments.

Preliminary Customer Requirements (CR)

1. *The arm must identify the location to engage the buttons/contact via video recognition (software will be provided by lockheed)*
2. *The robotic head height & width must be reduced to approximately 50% of its current size (to make room for the camera).*
3. *The movement time between position to position must be reduced by 50%*
4. *Ensure wire routing & power supply mounting are robust and immune to accidental damage*
5. *The software must enable more precise control and enable image recognition*

Preliminary Engineering Requirements (ER)

1. Engage correct buttons on screen 100% of the time.
2. Height & width - TBD inches max (50% of existing device)
3. Can find image within 3 seconds; can move extremity to extremity within 1 second.
4. All wiring and connections are covered with incorporation of stress relief
5. Pointer will not be off more than 1 mm after 100 presses.

Constraints

1. *Budget: MSD Budget TBD*
2. *Image recognition algorithm will be provided by Lockheed in the form of DLL or link library*
3. *The basic concept of ATLAS I must be retained. This includes physical & performance requirements unless otherwise specified above.*

Project Deliverables

Minimum requirements:

- *All design documents (e.g., concepts, analysis, detailed drawings/schematics, BOM, test results)*
- *Working prototype*
- *Technical paper*
- *Poster*
- *All teams finishing during the spring term are expected to participate in ImagineRIT*

Additional required deliverables:

- *Any Lockheed supplied material and all unused purchased material*

Budget Information

- *Previous ATLAS unit will be available for team to rework & use as deliverable if the team so chooses.*

Intellectual Property

All team members will be required to sign over their IP rights

U.S. Citizenship

U.S. Citizenship required

Project Resources

Anticipated Student Staffing by Discipline

Please provide a brief explanation of the expected activities for each required discipline. "Other" includes students from any department on campus besides those explicitly listed. For example, we have done projects with students from Industrial Design, Business, Software Engineering, Civil Engineering Technology, and Information Technology.

Department	Expected Activities
Biomedical Engineering	
Computer Engineering	Software centric individual to adopt image recognition algorithm to position location and reduce cycle time.
Electrical Engineering	Manage power system for addition of camera & cycle time modifications
Industrial & Systems Engineering	
Mechanical Engineering	Reduce footprint of robotic head and mount camera.
Other	Team must combine CE, EE & ME techniques to achieve overall performance improvements

Required Resources

Faculty	SME for image recognition technology
Environment	EE lab
Equipment	n/a
Materials	monitor will be provided by Lockheed
Other	