Virtual Design Review 1

"Hologram" for Anthropometric Scanning

16 October 2018

Group Members

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Our Project Supporter: Dr. Yubin Xi

Dr. Xi is a philanthropic contributor focused on academic opportunity and higher education

Presented by: Josiah Bazyler

Objective

The objective of this project is to provide a user interface for participants in a 3D body scan environment to improve the quality of the scan and reduce the amount of instructions given by the scan technician.

Figure 1: Anthropometric scan of various hand orientations

Presented by: Josiah Bazyler

Project Background

- Anthropometric scanners scan individuals
- Produces 3D rendered images
- Scans are beneficial in the design process

Figure 2: Romer Arm 3D Laser Scanner

Figure 3: FARO Focus 3D Laser Scanner

Presented by: Josiah Bazyler

Project Background

Typical scanning session:

- Technicians verbally orient user's hand/head
- Fill scanner's "sweet spot"
  - Tedious and time-consuming process
  - Wasted time (money) spent on orienting hand/head

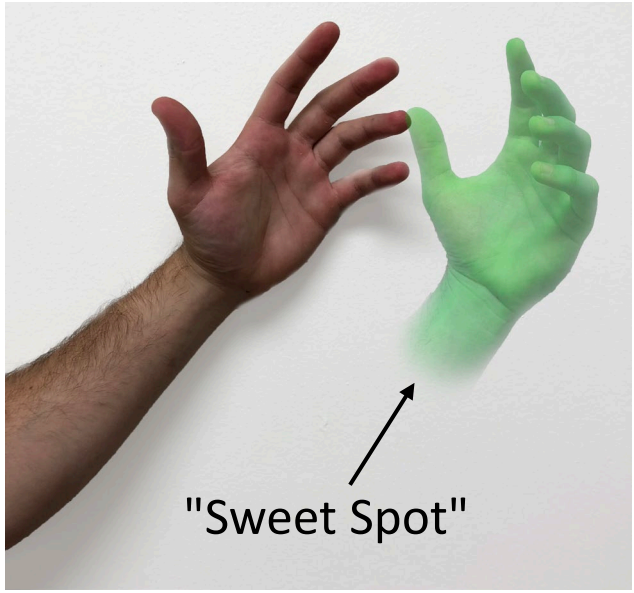

Figure 4: Example of indicating hand location and orientation

Presented by: Josiah Bazyler

Key Goals & Assumptions

- Streamline the anthropometric scanning process
- Current Scan Setup
  - Scan subject verbally moved into ideal scanning location
  - Long, difficult process
  - Large amount of verbal direction necessary
- Project Goal
  - Scan subject should automatically position self into ideal scanning location
  - Scan subject only given explicit visual cues to position self
    - Three-dimensional cues preferred
    - No additional information will be provided
  - No verbal instructions should be given

Presented by: Josiah Bazyler

Key Goals & Assumptions (Cont.)

- Assumptions
  - Focus on hand and head orientations
  - Creating a supplemental device to the current scanner
  - Limited instruction from scan administrator
  - Adaptable to different body types

Markets

- Security
- Telecommunication
- Medical
- CAD/3D Modeling Design
- Video Games

Presented by: Matthew Bigerton

Customer Needs Intro.

- Purpose of customer needs table
  - Organize the sponsors' statements and needs into governing project statements
- Development of customer needs
  - Derived from the first sponsor meeting
    - Based upon the various project questions asked of our sponsor, Dr. Yubin Xi
    - the group limited the following table to six (6) high priority customer needs

Presented by: Matthew Bigerton

Customer Needs

#	CUSTOMER STATEMENTS	INTEPRETED NEED
1	Project something into space for the participant to aim their head/hand.	The device must indicate to the participant the ideal location and orientation for accurate scans.
2	The device must be a stand-alone system	The device must complete its intended function without the assistance of other devices.
3	It would be beneficial if the device could indicate to the user when the “sweet spot” is filled.	If possible, the device will be able to notify the user to hold the current orientation of the participant’s head/hand.
4	The device must not interfere with the scanner.	The device must cease operating upon successful fulfillment of the “sweet spot”
5	The device must be able to be powered remotely.	The device requires a method for power control
6	The device must not create any safety hazards.	The device must minimally impact the participant

Table 1: List of Customer Statements and Interpreted Needs

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Functional Decomposition

- Top line is Project (Black)
- The second line is the major components (Blue)
- The following lines important aspects of the major components (Red)

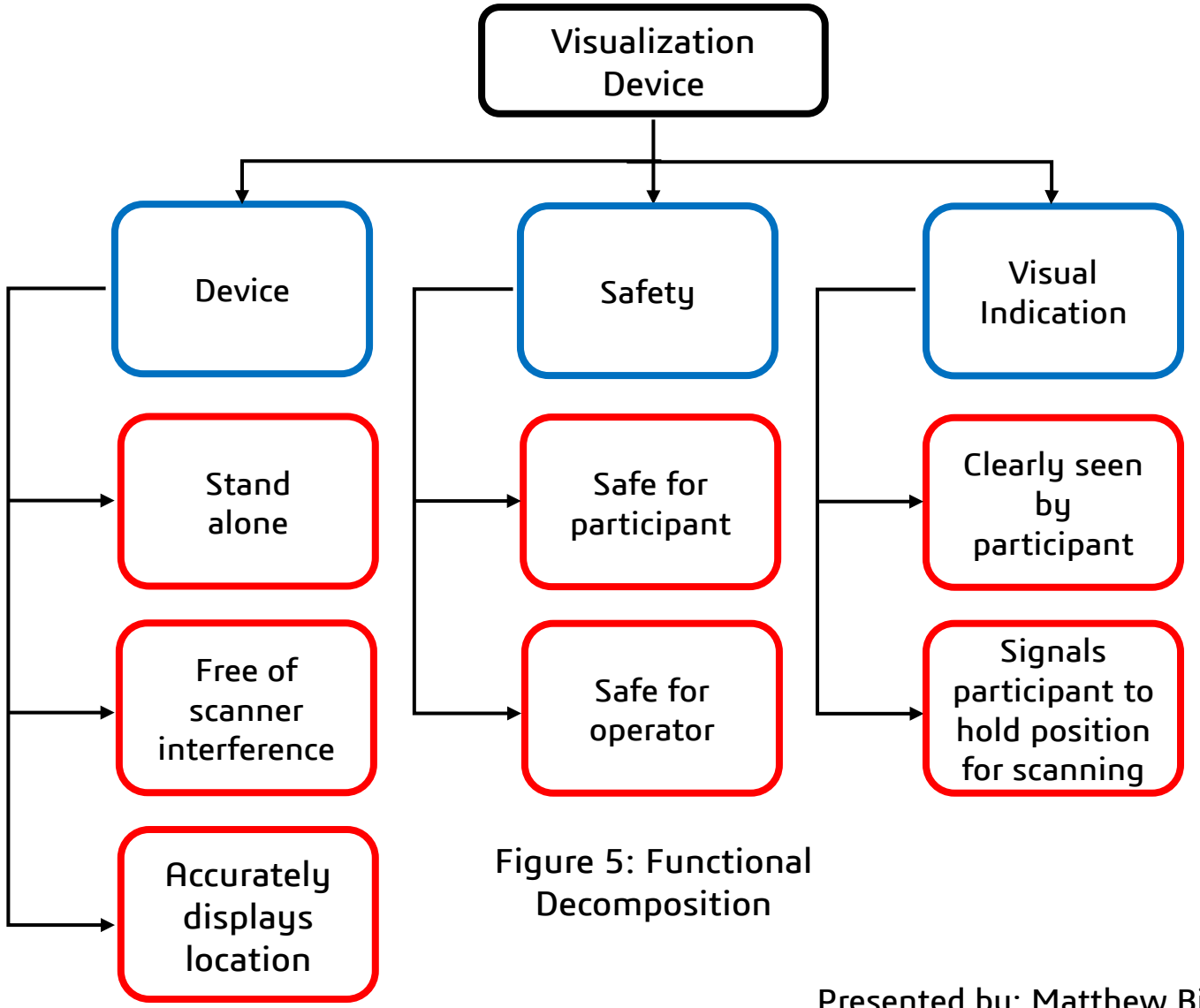

Figure 5: Functional Decomposition

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Gantt Chart

Senior Design 1 Tasks	% Complete
Sponsor Meet and Greet	100%
Project Charter	100%
Adviser Meet and Greet	100%
Work Breakdown Structure	100%
Customer Needs	100%
Functional Decomposition	100%
VDR 1	In Progress
Targets	In Progress
Concept Generation	In Progress
Concept Selection	0%
VDR 2	0%
Bill of Materials (BOM)	0%
Risk Assessment	0%
Spring Project Plan	0%
VDR 3	0%

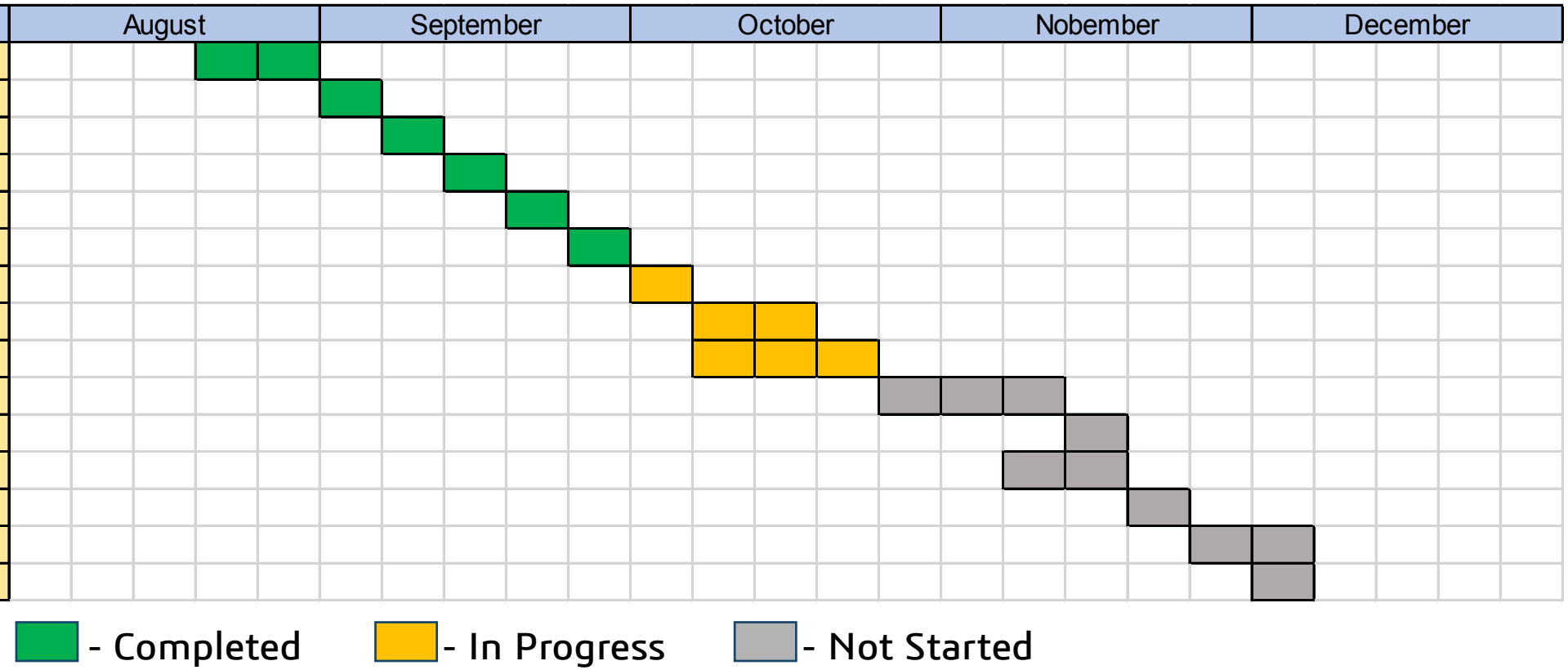

Table 2: Gantt Chart for Fall Semester of Senior Design

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Concluding Remarks and Future Work

- Concluding Remarks:
  - Key Goal: Improve the ease of the anthropometric scanning process
  - Create necessary 3D visual scanning room cues
  - Continue research into current and potential "hologram" technologies
- Future Work:
  - Concept generation
  - Concept selection
  - Bill of Materials

Presented by: Josiah Bazyler

References

1. https://www.drawingninja.com/t/hand-reference-3d.html
2. https://www.faro.com/en-gb/products/construction-bim-cim/faro-focus/
3. https://www.indiamart.com/proddetail/romer-arm-3d-laser-scanner-13716207748.html
4. https://unsplash.com/search/photos/holding-phone
5. https://news.softpedia.com/news/Problems-with-iPhone-6-Ear-Speaker-Reported-467077.shtml

Questions?

Presented by: Josiah Bazyler