THEIA Seeing App

Indoor Navigation

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AS-IS

- Stevie is trying to go to his next classroom. He knows he needs to walk ahead a few steps, and then turn left around the corner
- However, he is not sure when to turn
- He took a guess, but turned too early, hit the wall and hurt his head

TO-BE

- The THEIA app asks Stevie to give his current location and the destination
- The app calculated the route from the current location to the destination
- THEIA tells Stevie to “walk ahead 10 steps, then turn left”

AS-IS

- Stevie is following the route
- THEIA app is giving routes just as expected
- However, there is a new desk in the way of his usual path as people are moving stuff around leaving this desk there
- He doesn’t realize and walks into it

TO-BE

- The THEIA app utilizes Stevies phone camera
- The app notices an obstacle in the path that is in Stevies way
- The app tells Stevie to “Be cautious of an obstacle. Take 5 steps right and then forward again”

AS-IS

- Stevie is following the route that THEIA has provided
- Stevie accidentally trips on something and falls over
- The fall knocked the phone out of Stevies hand and Stevie cannot find it

TO-BE

- The THEIA app will realize that Stevie has fallen using the phones gyro sensor
- The THEIA app will immediately start ringing so that Stevie can find the phone
- If Stevie doesn’t find the phone quick enough, an emergency contact will be contacted

Assessment of Scenarios

Based on the three scenarios:

- Fall Detection - noise / dialog pops up when a fall is observed.
- Mapping - based on users location, a route will be.
- Camera Object Detection - the camera will observe any potential obstructions, notifying the user before anything blocks the path of that user.

The following scenarios have been implemented to some extent, providing the baseline for future implementation. This work has included:

- Including a dialog as well as an alarm like noise when a fall detection simulation has occurred
    - Mobile Geyoro detection would be a future implementation (this would detect falls)
- Various maps of the university have been added to assist in getting the user around WSU buildings
    - Geolocation / directional paths would be a future implementation
- Camera was implemented
    - Advanced AI object detection would be a future implementation

Function Point Analysis

Internal Logic Functions	External Interface Files	External Input Transaction	External Output Transaction
Menu Systems (7 FPs)	Speech to Text (5 FPs)	Collect Sound/Speech Data (3 FPs)	Select Route for User (6 FPs)
Calculate Best Route (10 FPs)	Geolocation Interface (7 FPs)	Gather Map Data (6 FPs)	Navigate User Along Route (6 FP)
Fall Detection (7 FPs)	Text to Speech (5 FPs)		Verbal Feedback (4 FPs)
	Phone/Contact Interface (5 FPs)		Haptic Feedback (5 Fps)
	Gyro Interface (5 FPs)		

Estimated Scope Creep

- Entire Theia Project: 81 FPs
- 15% Scope Creep Could be Handled
  - 4 person team
    - Could handle likely 2 new items per month
    - Do this while making standard progress
  - Current items average around 6 FPs
  - Could handle new 12 FPs
  - 12/81 = 14.8%

Actual Scope Creep

- New Item In Scope: Camera Interaction
- About 5 Function Points of Content
- 5/81 = 6.2%
- 6% Scope Creep in one month of work

Creeping Rate Accuracy

- Our Function Point analysis and scope creep was done incorrectly the first time around, this has been fixed and updated.
- From requirements estimated 15% scope creep
  - 50% of team adds new item
  - Average cost of 6 FPs
- Actual 6% Scope Creep
  - One New Item
  - 5 FP Cost
- ⅓ of Anticipated Scope Creep