Dream Team

AS-IS and TO-BE document

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AS-IS Scenario

• Stevie is trying to go to his next classroom so he enters the correct building. • However, he is not sure how far to walk down the hallway or where to turn. • He was unable to find his classroom on his own, wandered around the building with no luck, and missed his class.	• Stevie knows which classroom he wants to arrive at. • He cannot read the room numbers • He walked to where he thought it was but it turned out to be a different classroom	• Stevie cannot see an incoming obstacle in his path. Without knowing something is coming up, he accidentally runs into it. • When he runs into the object, he trips and falls. • This accident can seriously hurt Stevie.

To-Be Scenario

• Stevie inputs the correct location into the THEIA app upon entering the building. • The app calculates his location and the distance of the walk. • Stevie is correctly directed to his destination and is not lost.	• The THEIA app asks Stevie to give his current location and the destination. • The app utilizes the building map and tells Stevie where and how to enter the desired classroom • “Walk ahead 5 steps, turn right, walk ahead three steps, now you’ve reached your destination”	• The app detects and alerts the user of upcoming obstacles in their path so that all collisions are avoided. • In the event of an accident the app allows for emergency contacts.

Comparison to Other Options

	Cane	Guide Dog	Theia	Cane + GD	Cane + Theia	GD + Theia
See	No --	Yes ++	Yes +	Yes +	Yes +	Yes ++
Feel	Yes ++	Yes ++	No -	Yes +++	Yes +	Yes ++
Hear	No --	Yes ++	Yes ++	Yes +	Yes ++	Yes ++
Talk	No --	To some extent +(bark)	Yes +++	To some extent +	Yes ++	Yes ++
Think	No --	To some extent +	Yes ++	To some extent +	Yes ++	Yes ++
Smell	No --	Yes ++	Yes --	Yes +	No ---	Yes +

	Guide Dog	Cane	App
Advantages	• Interaction with a dog in real time and in-person • Dog is able to alert/signal you in different ways given it's training in real time • Can alert others if person falls • Can tell you where to stop and when it's safe to proceed.	• Intuitive interaction to detect objects in the environment. • Does not rely on technology or foreign management to function. • Can feel objects before you run into them • Gives users independence • More affordable	• Pre-programed room destinations • Emergency detection and alerting • Detecting and warning of objects • User probably already has a phone.
Disadvantages	• Cannot give user the directions/route to the desired location • Possibly could get distracted. • Does not speak verbal languages. • Can be pricey to train and buy guide dog	• User has to carry a cane with them everywhere they go. • Requires close distance to objects to detect. • Not sufficient to determine current location or area. • Can get stuck in cracks in the pavement.	• Cannot use without a phone • Phone battery can die • Not as versatile • Needs to have loaded map.

Justification

- No additional time needed to train dog or yourself on the paths to different classrooms.
- Emergency help is instantaneous and emergency contacts can receive your exactly location and activity.
- Detects objects in order to avoid collisions in real time.
- Is able to correctly and safely guide the user to their desired location.
- Can let the user change destinations mid-navigation if they want to.
- When you fall, you can end up dropping the cane several feet away, whereas the app can send help instantaneously.
- Does not require additional hardware since user most likely has a phone already instead of needing to purchase a dog or cane.
- It is very compact making it portable and convenient
- No maintenance cost. Updates automatically.

Top Priority Scenario

- What if:
  - What if the user falls down or needs help while using the app?
    - (i) Can a nearby person help the user?
    - (ii) Are they in an area where they can get help in some way?
- Who:
  - Who calls the emergency contact? (i): The app, (ii): the user
  - Who should be notified? (i): The emergency contact, (ii) (911), (iii) Hospital
- When:
  - When should an emergency be notified? (i): On voice command, (ii) If user responds to app's question to call emergency contact (iii) If app does not detect any movement from user for at least five minutes while currently in navigation
- How-to:
  - How to obtain emergency contact?: (i) Through user's input in settings (2)
  - How to detect emergency?: (i) If user commands to call, (ii) if user responds with a yes if app detects a fall, (iii) If app senses no movement from user during navigation
  - How to transfer information?: (i) verbal, (ii) sensors

Creeping Rates

Since Requirements creeping rate = percentage of change/time and we are already near halfway through the semester, the creeping rate we can accomodate would be quite low.

3 (Requirements that can be easily changed) / **16** (Number of total requirements that need to be done) = **18.7%**

GPS Tracking(FR1), Navigation(FR5), and Navigation UI(FR11) are the requirements with easily accommodatable modifications.

Therefore, **18.7%** is the total creep rate that can be handled at the moment.