# Phase 2 System Presentation

Team FME

# Scenario 1

TO-BE

- The THEIA app asks Stevie to give his current location and the destination.
- The app calculates the route from the current location to the destination.
- THEIA tells Stevie to “walk forward 10 meters”. Stevie can command THEIA to Repeat Step in case he misses the guidance
- After that, when Stevie reaches the turn point, THEIA tells Stevie to “turn left”
- In case there is a miscalculation and Stevie gets hurt, Emergency Call/Caretaker will be triggered

Assessment

Our prototype is able to audibly receive directions of whether to walk forward, walk left, walk right, and to turn around incase he overshoots a turn. Our prototype can give these directions, but right now nothing is actually being calculated and random directions are being output every 10 seconds. We also implemented the ability to repeat the last direction given. We have dedicated buttons for emergency contact and caretaker contact as well, and the call functionality works and will automatically open the phone dialer with the caretakers number loaded, meaning the user only has to click one button to get in contact with their caretaker.

# Scenario 2

TO-BE

- Stevie is knocked unconscious due to falling.
- Stevies caretaker is notified of Stevies GPS coordinates and is able to come to help Stevie.
- Stevies caretaker helps Stevie before it's too late and everyone is happy.

Assessment

Our prototype has developed the ability to display the user's current GPT latitude and longitude using the user's smartphone device. We currently do not have this setup so that a call or message is automatically sent to a caretaker with this information, but since we are able to get the GPS data this could definitely theoretically be implemented in the future.

# Scenario 3

TO-BE

- Stevies primary caretaker entered their emergency contact info on the Caretaker info page of the THEIA application.
- Stevie trips and falls on his way to class and falls to the ground unconscious where no one is currently around.
- THEIA detects the fall, and immediately notifies the caretaker via a message that Stevie has fallen with coordinates to his location using the smartphones GPS information.

Assessment

Our prototype includes a caretaker information page, which stores the caretakers information into a local database stored on the phone, allowing the the data to always be available with our without any internet services available and would allow for a bystander to be able to pick up Stevie's phone and easily press the “Call Caretaker” button to place a call to Stevies caretaker.

# Our Previously Planned Creeping Rate

**Data Functions and Transactional Functions:**

- Internal Logical File (ILF)
  - 2 point - Common Routine Routes
  - 3 point - Suggested Alternate Routes
- External Interface File (EIF)
  - 2 point - Map of the Building(s)
- External Input (EI)
  - 1 point - Current Location
  - 1 point - Destination Location
- External Output (EO)
  - 5 point - Directions to Destination
- External Inquiry (EQ)
  - 2 point - Available Alternative Routes
  - 1 point - How Many Steps to Destination

**Development Function Point Count**

- Size of functions delivered to the user by the development project (ADD) = FP Count (ILFs) + FP Count (EIFs) + FP Count (EIs) + FP Count (EOs) + FP Count (EQs) = 0
- Size of the conversion functionality (CFP) = FP Count (ILFs) + FP Count (EIFs) + FP Count (EIs) + FP Count (EOs) + FP Count (EQs) = 11
- Development Function Point Count (DFP) = ADD + CFP = 11 + 0 = 11

**Creep Rate:**

- Estimated Beginning Number of Function Points: 11
- Estimated End Number of Function Points: 20
- Number of Months for Project: 2
- Creep Rate: ((20-11)/11)/2 = **~41%**

# Was our Estimated Creeping Rate Accurate? Yes.

- The project's Creeping Rate was decently steady and well-controlled.
- There were not many additional features added to the prototype, but there was a lot more that went into realizing those features that originally thought of.
- We were careful about the features we wanted to focus on, which allowed us to focus on getting the features completed that we needed without running into many obstacles.
- Our prototype implements a decent amount of our planned features to show that this app could be brought to life with more time, although we are sure that obstacle detection and building mapping would definitely have been a more intricate problem to solve.

# Why use Theia?

# Indoor Traversal Option Comparisons

Cane Positives:

+ Best method to avoid obstacles as you can “feel them” through the cane

Cane Negatives:

- Can’t know what obstacles are approaching until you reach them
- Unable to provide any information on where you need to go
- Cannot alert anyone if the user is lost or injured

Guide Dog Positives:

+ Can alert the user to obstacles ahead of time
+ Can lead the user on trained routes
+ Can alert people if the user is injured or lost

Guide Dog Negatives:

- Much more expensive to train and own a dog compared to the other options
- Can’t lead users to destinations that are unknown to the dog

THEIA Positives:

+ Can alert the user to obstacles ahead of time
+ Can lead the user down the optimal path to any destination known to the system
+ Can alert people if the user is lost or injured

THEIA Negatives:

- Needs to know the layout of the building to guide the user
- Does not function if the users phone is broken or out of battery

# More benefits of using Theia

- Can control the app entirely with voice commands.
- Provides real-time obstacle detection and alerts before the user encounters them.
- Can guide users on the optimal path to any destination known to the system, offering flexibility beyond pre-trained routes and also personalize navigation preferences.
- Can alert others if the user is lost or injured, enhancing safety, communication and handling unexpected accident.
- Can function independently of physical aids like a cane or guide dog, relying on digital navigation.
- Offers cost-effective long-term use, as it doesn't require the extensive training and upkeep associated with guide dogs.
- Scalable for future enhancements, such as integration with wearable tech.