walkIT

One more step towards independence!

Final Report

Team members:
Dawa Sherpa, Computer Science, dsherpa002@citymail.cuny.edu
Jeevan Bastola, Computer Science, jbastol000@citymail.cuny.edu (POC)

Faculty Advisor:
Zhigang Zhu, Kayser Professor of Computer Science,
Grove School of Engineering, The City College of New York

Industrial Mentor:
Celina Cavalluzzi, Assistant Vice President, Day Services Director, Goodwill NY/NJ

Background

According to CDC, Autism spectrum disorder (ASD) is a developmental disability caused by differences in the brain[1]. Communication and social interaction issues, as well as repetitive interests, are common in people with ASD. Similar difficulties with social interaction, meeting new people, and going to social events are experienced by those with Social Anxiety Disorder. According to data from 2018, the CDC reported that 1 in 44 kids in the U.S. has an autism spectrum disorder (ASD)[2] and at some point, in their lives, 12.1% of American adults are thought to suffer from Social Anxiety Disorder (SAD). Someone suffering from ASD or SAD, or both can have extreme difficulty being independent, having a job, relationship, etc., as all these activities require social interactions[3].

During our visit to Goodwill's Day Services for young adults with ASD, we discovered that their main objective is to help students secure jobs and gain independence. However, ASD and social anxiety disorder can create challenges for individuals in becoming self-sufficient, particularly when it comes to outdoor activities and social interactions. Autistic symptoms can exacerbate social anxiety, making it difficult to engage with others and achieve personal or professional goals. The sensory demands and societal pressure faced by individuals with ASD can also contribute to increased anxiety. Although there are existing technologies to assist people with SAD and ASD, there is a lack of progressive outdoor navigation applications specifically tailored to their needs, which is crucial for fostering independence.

Problem Statement

Individuals with ASD and/or social anxiety disorder face difficulties navigating outdoors, particularly in complex environments like New York City with crowded transit systems. The ability to independently travel to different places such as work, grocery stores, and home is crucial for their independence and employment readiness. To address this challenge, we present *walkIT*, an application designed to help people with ASD and SAD gradually overcome their social fears. Our goal is to empower users to become more independent, one step at a time, with our slogan "One more step towards independence!" walkIT is targeted towards individuals with ASD, SAD, or both, who struggle with exploring places without assistance.

To foster goal-setting and achievement, walkIT is a navigation app that allows users and caregivers to establish a personalized, long-term plan for neighborhood exploration at the user's own pace. Initially, the user's comfortable walking distance is determined, and as they gain confidence, walkIT assists in gradually increasing that distance to enhance independence over time. The application incorporates advanced navigation features, including verbal guidance and calming music specifically designed for individuals with ASD and SAD, promoting a sense of calmness and comfort in outdoor spaces known for their crowds and noise. walkIT serves as both a *psychological and physical training app*, helping users adapt to outdoor environments while also promoting calorie burning. The app draws inspiration from Google Maps for navigation functionality and the goal-based system of Apple Fitness.

Rationale

Existing navigation apps like Google Maps are not designed for individuals with ASD or SAD, as they can be overwhelming and do not help users gradually adapt to outdoor spaces. Although there are ASD-specific navigation apps available, such as SpectrumNavigation, they focus solely on point-to-point navigation without addressing the progressive comfort of users outdoors.

In addition to technical resources, individuals with ASD and SAD also rely on guardians or caretakers. walkIT aims to reduce the dependence on guardians or caretakers over time by fostering independence. Users' guardians or caretakers can monitor their location, and an emergency button is available for added safety and reassurance during independent outdoor walks.

walkIT's goal-based system facilitates the development of independence and comfort outdoors. The app will be freely accessible on iOS and Android platforms, utilizing the Google Maps API for navigation. Goals will be tailored based on user feedback, while a gamified goal tracking system, user-friendly interface, verbal navigation, and calming music ensure a pleasant user experience. walkIT can also serve as a training tool for commuting and work-related travel, empowering individuals to navigate and engage in community-based employment.

By becoming accustomed to independent travel, individuals with ASD and/or SAD can reduce their reliance on paratransit services. This reduces the potential issues of tardiness or early pick-ups that may arise from using paratransit, promoting a more consistent and reliable work schedule.

Design and Development of Systems
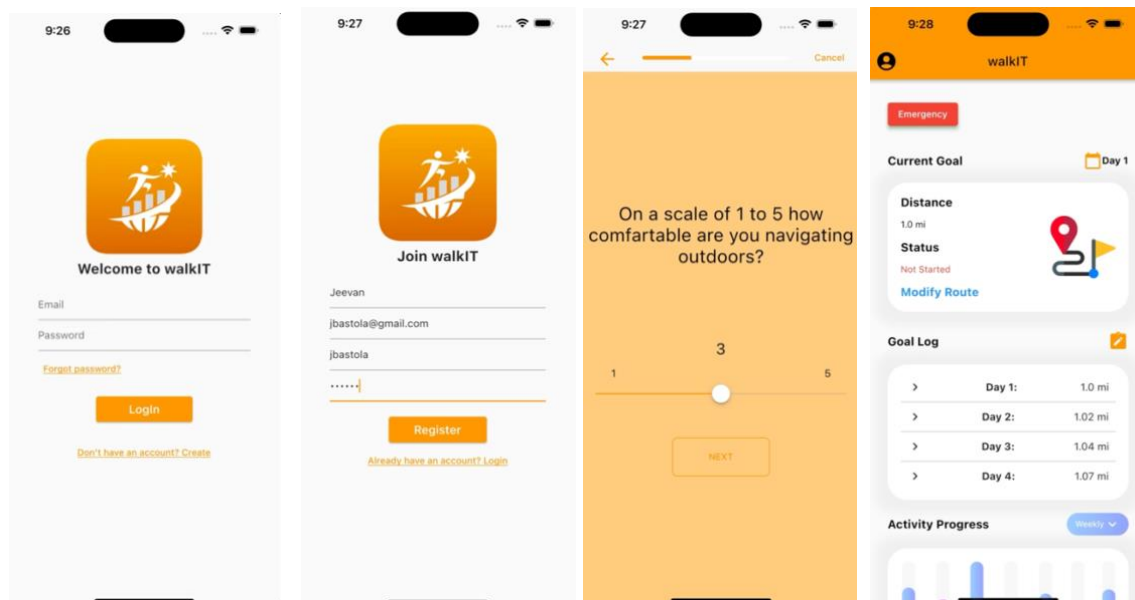
To use walkIT, users are required to create an account by accessing the **Sign-In Page** or the **Sign-Up Page**. These pages serve as the entry point for new and existing users.

Once a user successfully signs up, they will be directed to the **Survey Page**. Here, they will be prompted to complete a survey that helps customize the app based on their goals and preferences. Additionally, users can set up emergency contacts to ensure their safety while using the app. The survey responses will determine the initial goals presented to each user upon completion.

After completing the survey, users will be redirected to the **Home Page**, which includes essential features for an enhanced experience. The Home Page features an emergency button, the current goal, a goal log, and activity progress tracking.
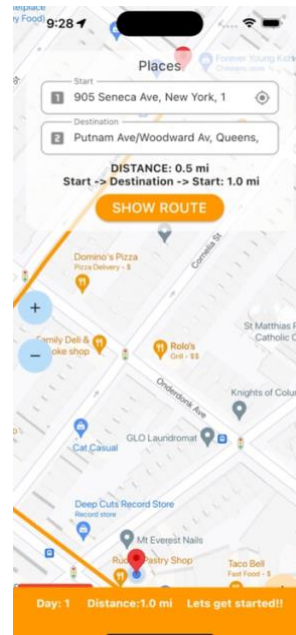
The goal log is generated based on the user's survey responses and is updated using a goal tracking algorithm. This algorithm takes into account the user's progress in completing each goal. If a user is unable to complete a day's goal, the current goal will automatically shift to the next day, or their subsequent goals may be adjusted based on their completion time and comfort level. As goals are accomplished, the progress indicator transforms from an arrow to a tick mark, providing a visual representation of achievement.
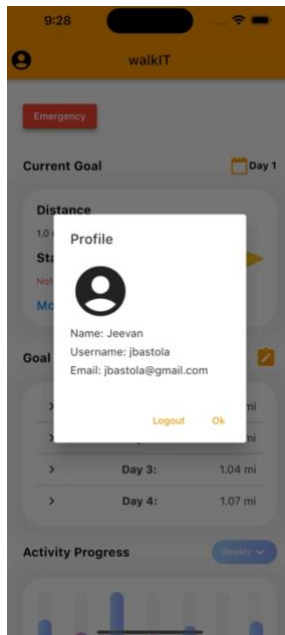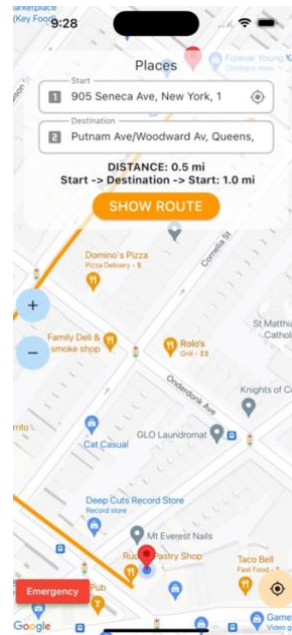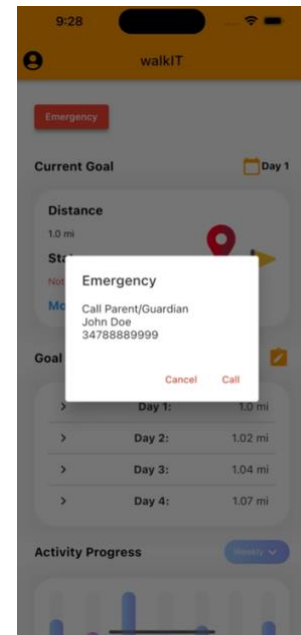
Profile Tab   Route Page   Route Generated   Emergency Tab

The **Profile Tab** is designed to provide users with easy access to their personal information and the option to log out from the app, ensuring a convenient and secure user experience.

On the **Route Page**, users will find an Emergency button for immediate access to emergency features. To enhance user convenience and remove the need for decision-making, walkIT automatically generates routes based on the user's current goal. For instance, if the user's current goal is to walk 1.0 mile, walkIT creates a destination that is 0.5 miles away, resulting in a total round trip of 1.0 mile. This automatic route generation alleviates the anxiety associated with choosing a walking route, providing a seamless experience for users.

The **Emergency Tab** is a dedicated section that allows users to view their caretaker's information. In case of an emergency, walkIT provides a call button that, when pressed, sends the user's current address to their designated caretaker and initiates a call. This functionality ensures that users feel secure and supported during their independent walks, knowing that help is easily accessible when needed.

Technologies Used:

- **Flutter**: Developed the app using Flutter for seamless compatibility with iOS and Android platforms, expanding our user base.
- **Google Maps API**: Integrated Google Maps API to enable accurate location tracking and smooth navigation within the app.
- **Firebase**: Leveraged Firebase as the reliable backend solution, ensuring efficient data management and secure user authentication.

Evaluation with Users & Partners

To ensure the effectiveness and usability of our app, we actively engaged with Goodwill NY/NJ and conducted site visits to their Goodwill's Day Services Program. This partnership allowed us to gather valuable feedback and insights from participants with autism spectrum disorder, ensuring that our app meets their specific needs. During our visits to the Goodwill center, we had the opportunity to interact directly with users and receive their feedback on our app's features. The response from users was overwhelmingly positive, with many expressing appreciation for the app's various functionalities. In particular, users highlighted the benefit of having multiple navigation options that catered to their individual preferences. This flexibility was highly valued, as it empowered them to navigate their surroundings in a way that felt comfortable and suitable for their unique needs.

Furthermore, the app's emergency features received high praise from users. These features were deemed essential for their safety and provided them with a sense of peace of mind during their day-to-day activities. Knowing that they had access to immediate help and support in case of emergencies significantly enhanced their confidence and independence. The valuable feedback and insights shared by stakeholders and users during our interactions played a vital role in refining and improving our app. We are immensely grateful for their contributions to our project, as their input allowed us to create a more user-centered and impactful solution.

Through our collaborative efforts with Goodwill NY/NJ and their participants, we have gained valuable firsthand knowledge that has helped shape the direction of our project. We remain committed to continuously incorporating user feedback and partner insights to ensure our app meets the needs of its intended users and provides a positive and empowering experience for all.

Discussion of Potential Markets & Future Work

Looking ahead, walkIT has the potential to expand its market beyond its initial target audience of individuals with Autism Spectrum Disorder (ASD) and Social Anxiety Disorder (SAD). While the app is primarily designed to cater to these specific groups, it can also be utilized by the general public. Additionally, walkIT holds potential for individuals with other disabilities, such as Alzheimer's, who could benefit from its navigation and safety features.

In our future plans, we envision creating a caretaker version of the app. This version would provide caretakers with access to important information such as goals, progress, and the current location of the person they are taking care of. This additional functionality would enhance communication, safety, and overall support for both users and their caregivers.

Another area of exploration involves the development of augmented reality (AR) glasses. By incorporating AR technology, walkIT can offer users a more immersive and intuitive navigation experience. AR glasses could provide visual cues and directions, simplifying the process of following routes and reducing reliance on handheld devices.

Expanding the market further, we are considering the integration of a social media component within the app. This addition would enable users to connect, compete, and motivate each other. By fostering a sense of community and friendly competition, walkIT would not only promote physical activity but also provide a platform for users to support and engage with one another.

These future plans aim to enhance the functionality and reach of walkIT, allowing it to cater to a wider range of users and improve their overall experience. By continuously exploring new opportunities and adapting to evolving needs, we strive to make walkIT a versatile and inclusive solution for individuals with diverse abilities and preferences.

Branding

Our brand name, walkIT, is derived from "Walk Independent," encapsulating the core mission of our app to assist users in achieving independence through outdoor navigation. Complementing our brand name, our tagline "One more step towards independence!" emphasizes the app's objective of empowering users to gradually enhance their self-reliance. This tagline serves as a constant reminder of the app's commitment to supporting users on their journey to independence, one step at a time. The logo of walkIT features a silhouette of a

person walking, with a star integrated into the design, symbolizing independence. This visually represents our app's mission and offers users a sense of aspiration and accomplishment.

walkIT logo

In terms of color scheme, we have chosen orange and white. Orange conveys energy, warmth, and enthusiasm, while white brings a sense of simplicity and clarity. This combination evokes positive emotions and aligns with our app's purpose of instilling confidence and comfort in users as they navigate outdoor spaces. The brand personality we aim to cultivate for walkIT is friendly, supportive, and empowering. Our app is designed to make users feel at ease and confident, and our brand voice reflects this approachability and encouragement. We want users to perceive walkIT as a trusted companion on their journey towards independence. Regarding brand positioning, walkIT primarily functions as a psychological and physical training app. With its goal-based planning, progress tracking, and gamification features, walkIT distinguishes itself as a unique solution tailored specifically for individuals with ASD and SAD. By focusing on these aspects, we position walkIT as an indispensable tool that addresses the unique challenges faced by our target audience.

For our marketing strategy, we will prioritize community outreach as our main approach. This encompasses various channels such as social media marketing, targeted ads, influencer partnerships, and community outreach programs. By engaging with the community, we can create awareness about walkIT, build trust, and foster a sense of belonging among users. This approach will allow us to reach our target audience effectively and establish walkIT as the go-to solution for enhancing independence and overcoming social fears. Overall, walkIT's branding embodies our commitment to empowering individuals with ASD and SAD, promoting independence, and providing a supportive and encouraging environment.

References

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Acknowledgements

Contributions of each individual member

Dawa Sherpa   +3: Dominant Contributor
Jeevan Bastola   +3: Dominant Contributor