Anxiety Application Presentation

Antigone Bellanich, Katie Zhao, Chaelin Lee,

Shannon Gill, and Patricia Messinger

Task

Our team was tasked with identifying a problem or opportunity within the Drexel and/or Philadelphia communities to address with a ubiquitous solution. We were told we would have unlimited resources, financial backing, as well as the support of local policymakers.

Problem Space

- Anxiety is one of the most common mental disorders in the United States
  - Affects 40 million adults ages 18+
  - 18.1% of the population
  - Even though anxiety disorders can be treated only 36.9% of people who are diagnosed receive treatment
- Different Types of Anxiety
  - Generalized Anxiety Disorder: affects 6.8 million adults or 3.1%
  - Panic Disorder: 6 million adults or 2.7%
  - Social Anxiety Disorder: 15 million adults or 6.8%
  - Specific Phobias: 19 million adults or 8.7%
  - Obsessive-Compulsive Disorder: 2.2 million adults or 1.0%
  - Posttraumatic Stress Disorder: 7.7 million adults or 3.5%
  - Major Depressive Disorder: 16.1 million adults or 6.7%
  - Persistent Depressive Disorder: 3.3 million adults 1.5%

Problem Space

- Target population
  - Generalized Anxiety Disorder
  - Panic Disorder
  - Social Anxiety Disorder
  - Specific Phobias
  - Post Traumatic Stress
- Current Available Resources & Their limitations
  - Various types of Therapy
  - Various types of Medication: SSRI, SNRI, Benzodiazepines
  - Service Dogs
    - Very expensive average $30,000-$40,000
    - Doctor approval, application process, other factors
- Improving Quality of Life
  - Carrying out day to day tasks becomes easier
  - Having personalized options to treat anxiety will overall reduce anxiety

Analyzing the Possibility for a Ubicomp Solution

- Context to introduce a ubicomp system
  - Allows for a customizable personal experience because the disorder is so personal in itself and varies greatly from person to person
  - System would be an example of calm technology- it's there when we need it, knows when to step in and provide assistance and doesn't require constant attention
- Improvements through ubicomp
  - Analyzed the role of service dogs and how we can recreate their abilities and further expand upon it
  - Service dog abilities
    - provide medication or water during an anxiety attack
    - provide a phone to call support system
    - Lead someone to you in a crisis
    - Provide tactile stimulation (licking face) to help manage emotions
    - Provide pressure to cheat or abdomen to create a calming effect during distress

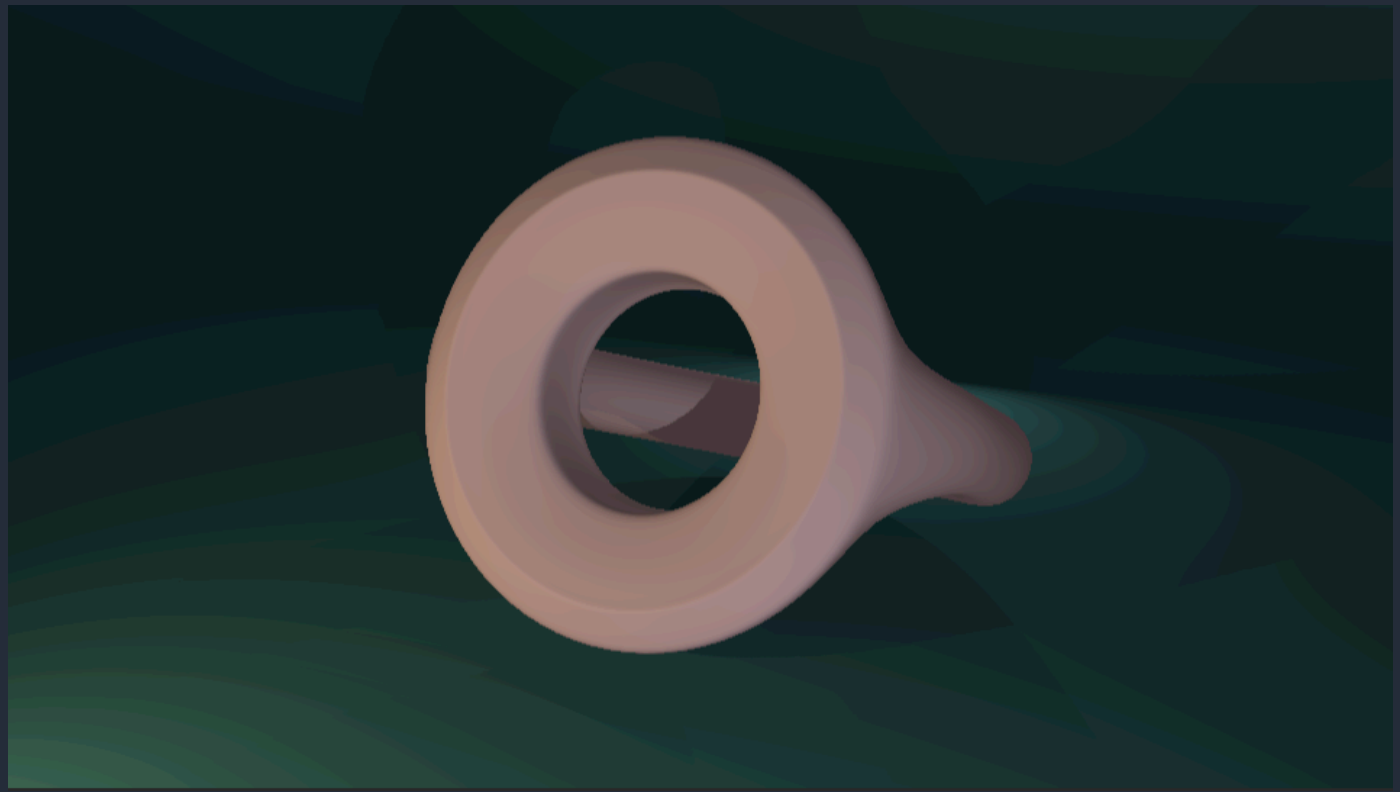
System Infrastructure

- Hardware
- Sensors
- Software
- Network
- User interface
- Data collection
- System handling

Hardware & Sensors

- Smart device
  - tablet and/or smartphone for software to be downloaded onto
- Wearable device to be worn around the wrist
- Sensors included in the hardware
  - Heart rate monitor
  - SpO2 monitor
  - Stress monitor

3D Model of Wearable



Software

- Software will be downloaded on a tablet or smartphone device
- Goal of Software
    - track and analyze data
    - provide feedback to user
    - limited alarms and notifications
    - offer guidance to user
- The interface will be an information overview (dashboard)
- Allows the user to navigate through different app functionalities

Network

- Good communication between hardware and software
- The wearable will communicate to the smartphone via bluetooth signals
- The application on the smartphone will update through the WiFi
- Need to ensure good connectivity

User Experience

- Norman’s 7 Fundamental Design Principles
  - Discoverability, affordances, signifiers, mapping, constraints, feedback, conceptual model
  - The interface will be self-explanatory with a focus on simplicity
- Calm Technology
  - Works in the background, calm technology, aids user without intervention
  - **How do we alert users without inducing more anxiety?**

Ubicomp User Interface

- The app is based on the most current generation of technologies, with the most sophisticated devices and modern aesthetics to enhance the experience.
- We didn’t create new metaphors and affordances. We build the app upon well known actions such as click and slide
- For first time users, there is a HELP section for a simplified walk through tutorial
- Our interface uses speech input in the journal section to allow users the option to voice record an entry rather than text type.

User Interface

Insert Link:
https://projects.invisionapp.com/share/QSETBS8BD#/screens/267742562_Home_Page

Data Collection

- Tracked and recorded through wearable and saved in Tracker tab of phone application
- Users can input their own data and reflect on past data to help themselves carry out a day of low- anxiety
- Users can then choose to share this data with the necessary doctors and/or support system

System Handling

- Will automatically send error reports to developers if system crashes or overloads (users consent to this as an agreement for using the app, as stated in Terms and Services)
- If wearable device disconnects due to battery or connectivity, the app will alert the user
- If wearable device is unsure about user status and condition, app will ask user to confirm or deny an emergency alert to contacts

Value

- Calm Technology
  - Wearable device - monitoring heart rate, Sp02, stress all the time (peripheral)
  - Anxiety disorder stroke, tell some ways to get over - music, breathe, or other therapy (attention)
- Mental Model
  - Inconvenience of potential of user involvement
  - Reliability of detecting the appropriate moment and appropriate action
  - Undesirability of the consequences if the system get wrong

Technical Implementation

- **Activity-Based & Context-Aware Computing**
  - Application utilizes data recorded by analyzing identity, time, and activity
  - Tracks activity through wearable devices
- **Tolerance for Ignorance and Transient Connections**
  - “Offline mode”
  - Notifications for when wearable devices need to be connected/synced
  - Notification when interacting with “old” data that needs to refreshed

Privacy

- User login with unique username and password
- Bluetooth and WiFi communication
  - Connecting to secure networks
  - Limited Bluetooth range

Context Awareness

Some features on our system are context-aware. It is a wearable that can track the user's body statistics without reliance on user's tasks. It will also try to determine a user's emotional state by their physical state.

- How would you categorize the context-aware features of your system?
  - The information that the will see on the application will be presented based on their inferred mood (based on physical state) and actions can be triggered accordingly.
  - Actions in the future of the app can be based on past sensor readings
  - Tag triggers and point out what may be causing them

Context Awareness (cont.)

Context as a proxy for human intent

By using the application, they are stating their intent. Issues may come up when misreading jumps in sensors such as from going to the gym, getting excited, etc.

Design of your system handle context inferencing and context ambiguity in order to provide an accurate and effective user experience?

Inferencing is basing information off of sensors, but it can be ambiguous

Can ask questions of users to get more of a baseline when new user joins

Resources

http://www.littleangelsservicedogs.org/
https://www.sciencedaily.com/releases/2012/10/121022112847.htm
https://www.healthline.com/health/service-dog-for-anxiety#psychiatric-service-dogs
https://www.nytimes.com/2017/10/11/magazine/why-are-more-american-teenagers-thaN-ever-suffering-from-severe-anxiety.html
https://www.gstatic.com/healthricherkp/pdf/anxiety_disorder.pdf
https://draxe.com/natural-remedies-anxiety/
https://adaa.org/finding-help/mobile-apps
https://adaa.org/finding-help/treatment
https://adaa.org/node/2675)
https://adaa.org/mentalhealthapps/anxietycoach)
https://adaa.org/node/2550)
https://adaa.org/understanding-anxiety
http://www.iaadp.org/psd_tasks.html
https://www.calmclinic.com/anxiety/attacks/what-happens-during-one

Thank you

Any questions?