



**COLLEGE OF TECHNOLOGY**

**DEPARTMENT OF COMPUTER INFORMATION  
TECHNOLOGY AND GRAPHICS**

**Application to Improve the Effects of  
Anxiety Disorder**

In partial fulfillment of the requirements for the  
degree of Bachelor of Science in Computer Graphics Technology

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[Fall/2019]

**SIGNATURE OF APPROVAL**



COLLEGE OF TECHNOLOGY



\*The instructor or faculty member who signed above have read, reviewed and approved this proposal and agreed that the proposal meets the requirements for a Senior Project Proposal for the Computer Graphics Technology program at Purdue University Northwest.

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## **STATEMENT OF ORIGINALITY**

This is to certify that to the best of my knowledge, the content of this Senior Project Proposal is my own work and that all the material contained in this proposal have been appropriately referenced. The above statement applies to all material and document associated with this project.

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I consent that the instructor or faculty member may require changes to this document. If any major changes to this project proposal are deemed necessary, I will provide a new proposal for review and approval.

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## **ABSTRACT**

This paper will address the problem of anxiety impacting the population's youth at an alarming rate, and how technology may be used as a solution. This study was done to better understand the effects anxiety has on someone's day-to-day life and what coping mechanisms are commonly present.

These methods were then taken and applied to technology to produce a potential solution in the form of prototype for a mobile application. Anxiety affects 19.1% of adults in the United States making it a serious issue that is on the rise, and the results of this study can help that populace better improve their quality of life ("Any Anxiety Disorder", 2017). This paper will outline the main issues associated with anxiety and how technology may be used to positively influence the moods and actions of sufferers. It will then cover how a mobile application can be a successful method for executing this solution.

## 1. INTRODUCTION

This study will cover the complex effects of anxiety disorders on the United States population and the possible solutions modern day technology can produce. Many people have argued that technology is increasing the anxiety in teens and young adults, and many studies have followed this in an attempt to confirm or deny. This study aims to prove that regardless of the base cause, technology has the potential to be a viable solution for anxiety sufferers.

Technology is being used by nearly everyone every day. Applications give successful solutions to multiple modern day issues, leading to the belief that it could solve even more. On the go applications are especially helpful with most of the population working or attending school on a daily or near-daily basis. With most of the population now owning some form of smartphone or tablet today access to mobile applications is easier than ever. It is this ease that makes a mobile application seem the best course of action.

The idea is that a mobile application built around determining and catering to user needs could be a major solution to getting a large majority of sufferers access to coping mechanisms when on the go. This paper uses anxiety and technology based studies along with already existing applications and information to determine the most feasible solution to benefit the most people possible. By making comparisons to what already exists it is possible to see what has succeeded and what has failed, and use that information to further prove the proposed solution.

The problem this study focuses on is improving the quality of life many people suffering from anxiety disorders have by making use of technology. Applications meant to do this already exist, but none that encompass all parts into one without a paywall in place.

According to the American Psychiatric Association anxiety is defined as a normal reaction to different forms of stress that in some cases can be beneficial, while anxiety disorders cause an excessive reaction to fear or stress resulting in avoidance behaviors that can affect job performance, grades, and personal relationships (Parekh, 2017). According to the National Institute of Mental Health, 19.1% of adults in the United States suffer from some form of an anxiety disorder (“Any Anxiety Disorder”, 2017). These disorders can result in panic attacks, leading many to become lost in their own minds and begin to neglect responsibilities and relationships in an attempt to avoid any triggers.

This is significant as when a person becomes lost and neglectful it can often lead to even more panic and anxiety as they begin to fall behind with work and relationships. As this builds upon itself it can cause a toxic effect that result in them doing nothing as the pile of work that has built up from the resulting stress begins to feel impenetrable.

The proposed solution to this problem is a prototype of a mobile application that will allow sufferers to keep track of feelings, moods, reactions, and attacks. It will allow users to track when and where they most commonly have their attacks and feature a check-in alert that can potentially help halt attacks before they begin. It will also have built-in features to help users calm down in the event that they suffer an attack such as a custom music playlist. Anxiety can make day to day life difficult, and this would give a solution to a long-running issue for many of its sufferers. The prototype could assist in existing treatment by giving an outlet for users to express their symptoms and find ways to cope with them. The final product resulting from this study would be a prototype of a fully functioning application.

## 2. REVIEW OF LITERATURE

In the age of technology, everyone seems to be glued to their phones. Despite the many studies done on smartphone use related to anxiety, no one seems to be putting it down any time soon. Instead, we continue with the devices that are known to feed anxiety's symptoms, such as fear of the unknown and avoidance (Hendriksen, 2018). Some studies were largely inconclusive with researchers unable to determine if symptoms of anxiety were caused by more use of technology, or if anxiety caused the user to use their phone more (Hunley, 2017). One thing is certain; smartphones are now a daily part of our lives and many users do suffer from anxiety. This literature review is going to cover many of the ways anxiety can be reduced, and how technology can help users cope.

According to Merriam-Webster, anxiety is defined as “apprehensive uneasiness or nervousness usually over an impending or anticipated ill”, or in the case of a medical diagnosis “an abnormal and overwhelming sense of apprehension and fear often marked by physical signs (such as tension, sweating, and increased pulse), by doubt concerning the reality and nature of the threat, and by self-doubt about one's capacity to cope with it” (Merriam-Webster, n.d.).

Anxiety disorder is a serious mental disorder that affects 19.1% of adults in the United States alone (“Any Anxiety Disorder”, 2017). It differs from regular anxiety by causing excessive fear and stress over otherwise mundane issues (Parekh, 2017). Anxiety disorders will lead a person to try and avoid any situation they think may cause a trigger (Parekh, 2017). This often results in a decreased performance at work, in school, or in maintaining relationships (Parekh, 2017). Often times this results in a snowball effect that will simply amplify the existing symptoms.

Computer graphics technology can be effectively implemented to help prototype a smartphone application, also called an app, that can assist users who are suffering from one of the many forms of anxiety. By researching what suffers use as coping mechanisms, and what researchers have found effective, an app can be developed that combines the most commonly used processes.

One very common coping mechanism that is also associated with technology as a whole is music. Many people already use music to do things such as to accomplish tasks, but what they do not realize is they are using music therapeutically (Rook, 2016). By creating playlists to match their mood users can help to calm the emotions they are dealing with. Instrumental music especially can help as it allows the listener to create their own story to go along with it, rather than listening to lyrics that tell the story of someone else (Rook, 2016). Music is a foundational tool for coping with all sorts of things, anxiety is just one. Therefore it is incredibly important to include.

Another useful tool is the ability to talk through issues with others suffering from the same problems (Parekh, 2017). Support groups will allow users to share experiences, triggers, and their own coping mechanisms in order to help others and discover new ideas for themselves (Parekh, 2017). This can be done anonymously as well in order to avoid triggering a user who does not do well in social situations.

In the moment it is difficult to tell what is triggering an anxiety attack, but keeping track of when and where it happens can help narrow down possibilities. Keeping a journal and looking for patterns is a great way of figuring these triggers out (“Tips to Manage Anxiety and Stress”, n.d.). A built-in journal with a mood tracker would allow users to keep track of both how they are feeling and what they are doing. This way, if they’re feeling stressed they can note what the cause may be, and

the same goes for feeling completely at ease. Together these can help them avoid their triggers and find a happy place to calm down in.

There are some sites in existence that are dedicated to helping with anxiety, but many consist of articles or blogs done by another sufferer (“Best of 2015”, 2015). While this can undoubtedly be helpful to others with the same condition, it is not very interactive for the sufferer. Having a way to document their own experiences would be beneficial to many.

However, a downside to blogging and journaling sites is that often times a user is able to be identified based upon information found within their account. Be it a username or email or anything else the site may display. The ability to have these communication techniques without fear of identification could help many users, especially those with social anxiety.

There are some mobile applications in existence for coping with anxiety. However, most of them focus on only one mechanism, be it music, mood tracking, or chatting (Juhasz, 2018). The only app found to combine multiple parts together is Pacifica, but the application itself only allows access to limited parts for free with the entire app becoming accessible after paying a monetary fee. This can be a huge negative for sufferers in tight financial situations.

After some research it was found that there are some currently well known applications that encompass one aspect of all of these. An article of 2019 anxiety apps listed the top rated options for the year. Some of these apps were; Headspace - a meditation app meant to help with sleep, mindfulness, happiness, and a number of other things, Rootd - an app meant to help you control panic and anxiety attacks, Stop Panic & Anxiety Self Help - this app combines the audio and diary portions of anxiety coping, Calm - another mindfulness app meant to help you sleep and reduce overall anxiety, Stop, Breath Think - a meditation app the doubles as a mood tracker, Colorfy - an

app that uses coloring as a calming mechanism, and Dare - Break Free from anxiety - an application that helps you to face what is causing your anxiety, rather than simply avoiding it (Doyle, 2019).

Every one of these apps has one or two of the mentioned solutions in them, but none have them all.

Using these highly rated applications as a guideline, an application that allows users to have everything in one place can be created.

Technology is becoming known as a catalyst for stress and anxiety, but it also may provide the best means for fighting back against those symptoms. With 81% of Americans owning smartphones and rising, technology does not seem to be going away any time soon (“Mobile Fact Sheet”, 2019). So perhaps instead of fighting technology, it should be utilized to fight against the issues it is causing. That way more people might benefit, and the negative symptoms of disorders like anxiety can be lessened.

### **3. METHODOLOGY**

The overall goal of this project as it currently stands is to prototype an application that will allow users to find relief from their anxiety in everyday situations. Whether this is by giving them the means to calm down or to document their triggers to prevent future episodes. For the purposes of this project, my target audience will be teens and young adults suffering from generalized anxiety and social anxiety disorders.

This app will have many functions that will be able to cater to different users based upon their needs. It will implement everything from music, to a calendar, to a mood tracker, and a journal. The end result of this project will be a basic functional prototype that can showcase what users may do in the app. This solution will be built using Axure RP and real world testing on anxiety sufferers

will determine whether or not the prototype is successful. Modifications can be made throughout the project as determined by the feedback from users.

The app will help users achieve goals by using various tools. In the event that users are forgetful, the app will allow them to set up alerts.

In the event that users are forgetful, the app will allow them to set up alerts. These alerts will notify them that they have not checked in for a while, and prompt them to input their current mood. If a user expresses an extremely negative mood, the app will suggest some actions to help them calm down. These actions are based on the Anxiety and Depression Association of America's infographic, suggesting things such as breathing exercises, taking a step back from what they are doing, and finding someone to talk to ("Tips to Manage Anxiety and Stress", n.d.).

Lifestyle choices also have some effects on anxiety. Keeping a list of what they consume in a day is another way users can try to improve their quality of life. Limiting things like caffeine and alcohol are known to help with symptoms ("Tips", n.d.). If users see exactly how much they are consuming, it may provide an incentive to cut back some.

Many of the coping mechanisms expressed here are well known to sufferers of anxiety, but there does not truly exist a place that can combine them all into one. That is the goal of this app, to give users a way to cope in whatever way they need to at that moment, and to help them reduce their overall symptoms of anxiety. Perhaps knowing they have options will also in turn help to make users feel more at ease.

Some potential problems that may arise with such an application are users being unable to make use of their device in any given situation, some security concerns regarding the chat-based feature, and the implemented coping mechanisms simply not working for some users. Some ways to

combat these concerns is to give tips to users for when they may be in a place where phones are not allowed, implement a type of security system to protect user information, and allowing users to leave feedback and suggestions regarding the offered mechanics.

The largest potential problem that could be faced is users determining that a mobile application is not a feasible solution at all for any given number of reasons. Whether that be the inability to keep their phone on their person during school or work, or finding the use to be tedious. In this event, an option to give tips for technologically dead zones could be brainstormed and potentially implemented.

#### **4. EXPECTED PROJECT RESULTS**

The end results of this project should be a fully functioning prototype with extensive user testing to produce the most user friendly model possible. It will let users see the main levels of the application such as the journal entries, calming activities, music section, and mood tracker. The app should be built to show as much of the full product as the given time allows, and be adjusted based upon the feedback received by test users.

The project's measure of success should be based around how well users respond to the presented prototype, as well as the overall quality of the designed prototype and the gaged effectiveness based on user feedback. The more positive the post use feedback the higher the measure of success. Success should also be measured around the overall completion of the product and whether or not tasks are completed on time.

**Success percentages**

|                        |     |
|------------------------|-----|
| Task Completion        | 20% |
| Positive User feedback | 20% |
| Task Time              | 15% |
| Project Success        | 20% |
| App Usability          | 15% |
| User Study             | 10% |

While the main measure of success will be in whether the application's prototype successfully does what it sets out to, properly understanding the application's users and making it as user friendly as possible are conjointly the highest success point in the project. It is the basis around which the entire prototype will be designed. Positive user feedback will be needed to stay on the right track, and the amount of time spent on each task will be important to make sure everything is completed in the end.

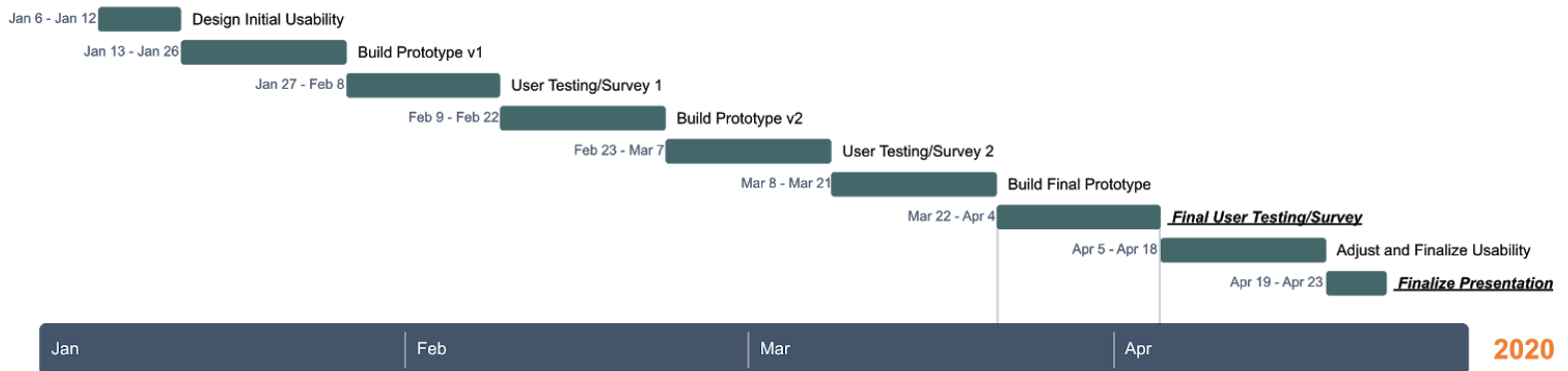
**5. BUDGET AND SCHEDULE**

Because all of the necessary resources are either already owned or available on campus this project should not need a budget, however in the event some minor things need to be purchased for the completion of user surveys a budget of \$20 has been set just in case.

Axure RP, computers, a laptop, and microsoft office programs are all available at no cost and will be the necessary components for this project.

Keeping on task is the single most important thing to ensure that this project is completed on time. For this reason keeping to the developed schedule is incredibly important to the success of this project.

## Anxiety Prototype Design Schedule



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