

# VIRTUAL REALITY: A PHOBIA APPROACH

Samia Loucif  
CTI  
Zayed University,  
Abu Dhabi, UAE  
samia.loucif@zu.ac.ae

Joao Negreiros  
CTI  
Zayed University  
Abu Dhabi, UAE  
joao.negreiros@zu.ac.ae

Batool. Haj Stifi  
Dept. Software  
Engineering  
ALHOSN University  
Abu Dhabi, UAE  
Batool.h.stifi@gmail.com

Sara Iqbal  
Dept. Software Engineering  
ALHOSN University  
Abu Dhabi, UAE  
contact@programmerszone.ae



---

**Advances on Societal Digital Transformation  
DIGITAL 2021  
November 14-18 - Athens, Greece**



# AUTHORS' BIOGRAPHY

---

- ❑ **Dr. Samia Loucif:** Associate Professor at Zayed University since Aug. 2019. Prior to joining Zayed University, Dr. Samia was an Associate Professor at ALHOSN University from Aug. 2007 to 2018 where she was the University General Computer courses coordinator and the Chair of the Software Engineering Department. She was a Post-Doctoral Research Fellow in the Faculty of Engineering, Moncton University, New Brunswick, Canada, and as Assistant Professor in UAEU. Dr. Samia has been member of organizing committees of several international conferences and workshops. She has served on program committees of several international conferences and workshops, and reviewer of well established international journals , as well as research grants. Dr. Samia is member of the research team Zayed University Interactive Media Lab, and member of IEEE.
- ❑ **Dr. Joao Negreiros:** *Associate Professor at Zayed University. He has published numerous books and articles in English and Portuguese, spanning multiple disciplines - Business, Technology, Education and Geographic Information Systems. he holds a Computer Science Bachelor from Lisbon, Portugal, a Master of Business and Administration from san Diego, CA, USA, a PHD in Information Technologies from Lisbon, Portugal and a Post-Doc in Geocomputation from Almeria, Spain. His teaching present fields are Data Warehouse, Knowledge Management, Management Information Systems, Databases and Data Analytics while his research area comprehends Technology in Education and Data Mining.*
- ❑ **Mrs. Batool Haj Stifi:** Graduated from ALHOSN university, with major in Software Engineering, Abu Dhabi, UAE. Currently working as freelancer.
- ❑ **Mrs. Sara Iqbal:** Graduated from ALHOSN university, with major in Software Engineering, Abu Dhabi, UAE. Currently working as freelancer.



# OUTLINE

---

- Introduction
- Requirement elicitation
- The Proposed App
  - Architecture
  - Features
  - Main Screens of the app
  - Testing
- Conclusion and Future Perspectives

# INTRODUCTION

---

- ❑ What is Phobia?
  - Its origin from Greek word Phobos –”exaggerated usually inexplicable and illogical huge fear of a particular object.”[1]
- ❑ Phobias can be caused either genetically or past experiences.
- ❑ Often, phobic people ignore their symptoms and do not get psychotherapy due either to the social perspective about visiting psychotherapists or cannot afford the cost of psychotherapy.



[1] Root word phobia membean 2020: [bba.ie/sites/default/files/pictures/eur-rxay/root-word-phobia-membean-18b7ee](https://bba.ie/sites/default/files/pictures/eur-rxay/root-word-phobia-membean-18b7ee)].



# PHOBIA TREATMENT

---

- ❑ Medication: anti-depressants and anti-anxiety pills to calm both physical and emotional reaction to fear.
- ❑ Cognitive Behavioral Therapy: being exposed to an environment that has elements that cause the phobic reaction.
- ❑ Some negative reactions of the second case: patient leave the treatment or, in extreme cases, pass out, some local communities, psychotherapy is not available or cannot afford it.

# VIRTUAL REALITY (VR)

---

- ❑ "It is a computer-generated environment with scenes and objects that appear to be real, making the user feel they are immersed in their surroundings."
- ❑ VR has gained attraction by researchers and industry, resulting in its application in several fields: entertainment, education, medicine, etc.
- ❑ Psychotherapy is a good example of VR applications in the healthcare sector.

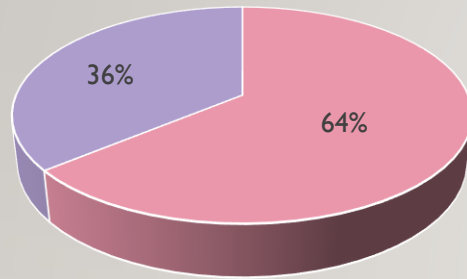
# VR FOR PHOBIA TREATMENT

---

- ❑ For a phobic person, VR gives reality feeling, the patient may experience the object or situation to overcome her fear
- ❑ Several VR-based applications have been developed such as
  - Previsl is a Spanish company offers VR Environments for closed spaces (Claustrophobia) and height phobia (Acrophobia).
  - CleVR developed a VR-based software to defeat the fear of flying (aviophobia).
  - Spider-World is a computer-based VR therapy with additional ability feature to feel the object. Patient can touch a virtual spider improving the patient confidence level towards the phobic stimulus.
  - Phobos is a VR-based application, developed by PsyTech LLC, treats phobic patient with a graded approach for patient to manage their anxiety symptoms, including interactive VR environments of some phobias such as flying, height, spiders and crowded spaces.
  - Several VR-based mobile applications were developed in this context as well.

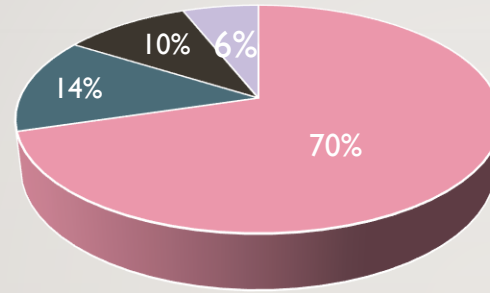
# PROPOSED APP FYF: REQUIREMENT ELICITATION

Gender participation ratio



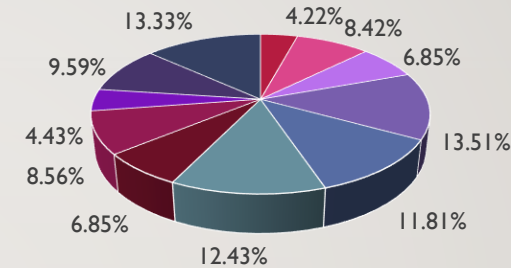
Male Female

Age distribution



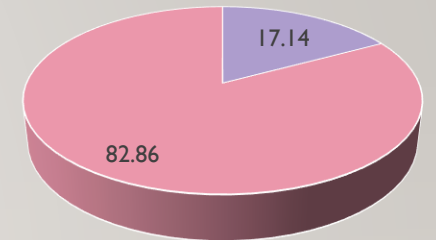
18-24 25-34 35-44 45-54

Phobia types



Arachnophobia Claustrophobia Glossophobia Aquaphobia  
 Acrophobia Achluophobia Avidophobia Entomophobia  
 Hemophobia Ailurophobia Others

Phobia treatment- preferences



Treatment-Pills

- Out of 77, only 54.67 searched for a specialist.
- Participants were asked whether the phobia they suffer from is connected to a specific event: 84.42% stated no.
- Phobic participants: 50% rapid heartbeat and 50 suffer from trouble breathing, panic attacks, shaking, nausea, run away and sweating.
- Adoption of a mobile application for phobia treatment: 63.51% were positive towards this idea.



# THE PROPOSED APP -FYF

---

- ❑ **FyF:** app developed to treat Water phobia (aquaphobia); (B) Darkness phobia (achluophobia).
- ❑ Targets exposure therapy to phobic patients in both safe and controlled environment.
- ❑ The graphics used are visually realistic with customized audios, suitable with each environment.
- ❑ The FyF App consists of a three-layer framework consisting of
  - **Presentation:** contains the user interfaces which represent the scenes and developed in Unity.
  - **Business:** is a service layer that contains Java (JS) and C# scripts to interact with the data layer for processing purpose and to display the scenes and give the appropriate feedback to the end-users.
  - **Data layer.**

# THE PROPOSED APP –FYF (CONTD.)

---

- ❑ It is VR-based phobia app runs on Android OS for smartphones.
- ❑ It also requires the use of VR glasses (Google Cardboard), which come in an affordable cost and in order to experience the phobia environment.
- ❑ Two types of users of our app: phobic patients and the psychotherapist.
- ❑ The patient is the one that experiences phobia environments.
- ❑ The psychotherapist may use the app to receive patient's experience results to follow up with her.

# FYF APP FEATURES

---

- Experience VR
- Get to Know Phobia
- Nearby psychotherapist



# EXPERIENCE VR – SELECT PHOBIA TYPE

---





# EXPERIENCE VR- SELECT SESSION TYPE FOR TARGET PHOBIA TYPE

---

- ❑ A short session helps the patient to stimulate with the environment
  - Three short session levels -duration of 5, 10 and 15 seconds, respectively.
- ❑ Long Sessions: have duration of 30 minutes, as recommended by doctors
  - Three levels, patient goes gradually from one level to the next level.
  - Duration per level: 5 minutes (level one), 10 (level two), and 15 minutes (level three).
- ❑ Before the therapy exposure, the patient can setup a relaxing audio.

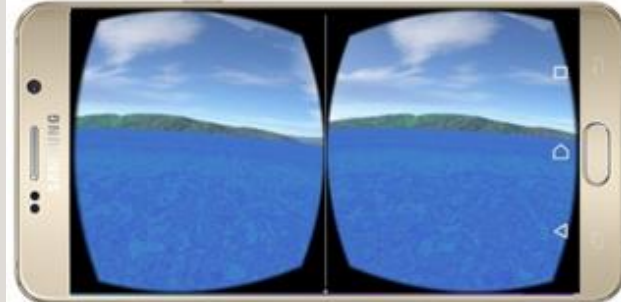


# AQUAPHOBIA

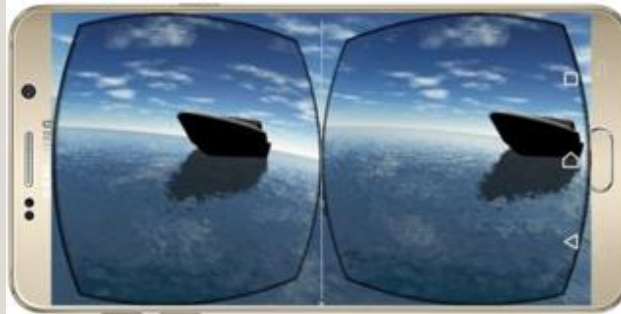
---



Level 1



Level 2



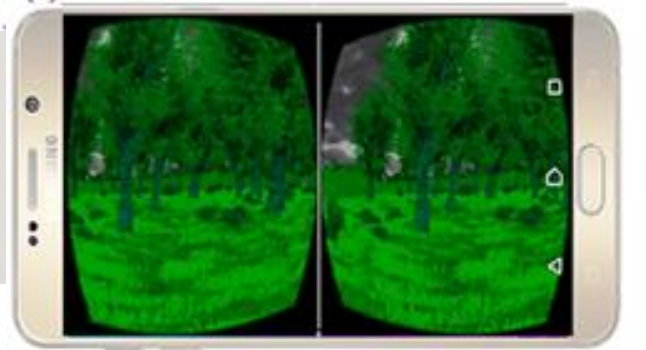
Level 3

# ACHLUOPHOBIA

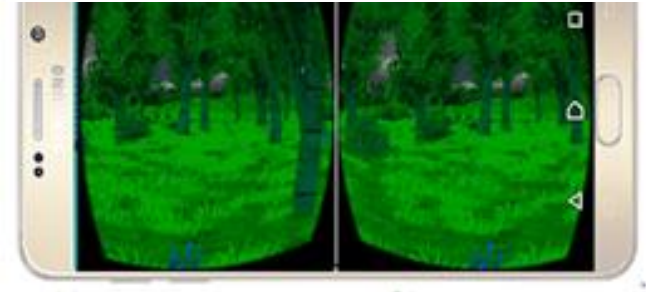
---



Level 1



Level 2



Level 3





# NEARBY PSYCHOTHERAPIST

---

- ❑ Helps user finding the nearest psychiatrics.
- ❑ User selects the city from the menu.
- ❑ Sub-menu regarding all hospitals that holds a psychiatry department is revealed to the user.
- ❑ For usability purposes: user selects from menu rather than typing names.
- ❑ When a hospital is selected, the address and telephone numbers are disclosed.

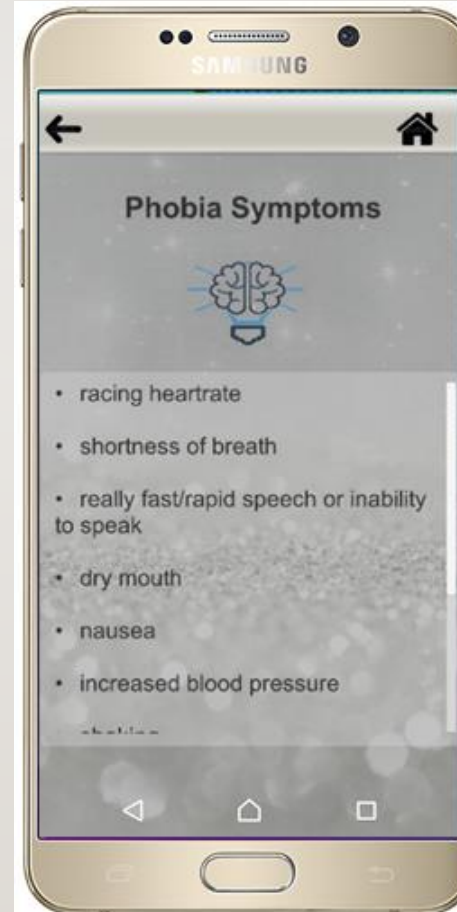




# GET TO KNOW PHOBIA

---

- ❑ Information about phobia types
- ❑ Common phobia symptoms



# PROPOSED APP FYF -TESTING

---

- ❑ Testing is an imperative when facing software development since it helps validation and verification of the product.
  - black box deals with the verification and validation of inputs and outputs.
  - white box, the app code was tested for polymorphism and connection between classes, coherence and inheritance.
- ❑ FyF was integrated by considering all short and long session levels together including all their interfaces.
- ❑ Get expert feedback is very important: we plan to gather feedback from experts in the field such as psychotherapists to measure the effectiveness of our app.

# CONCLUSION

---

- ❑ Phobia treatment is possible, but it demands patience, perseverance and time.
- ❑ A VR-based mobile app is proposed here to assist phobic patients with an easy use interface to undergo as an initial treatment.
- ❑ Current state of the app includes two types, found common from survey: aquaphobia and achluophobia.
- ❑ The app provides the virtual environment to each stimulus exposure to overcome their fear.
- ❑ Patients may experience a 360 degree view of the phobia agent environment along with sounds to provide a realistic scene.
- ❑ Patients move gradually from a level to the next.
- ❑ Patients can turn on music when they feel uncomfortable or move to higher concentration levels.
- ❑ The app provides textual description on types of phobia, their symptoms and treatments.
- ❑ The app helps patients to search for the nearby psychotherapist.

# FUTURE ENHANCEMENTS

---

- ❑ Other VR phobia environments might be added to our FyFVR application to extend the range of phobias that can offer exposure therapy to patients.
- ❑ Use of a smartwatch to be connected to monitor the heartbeat rate of the patient during any VR session.
- ❑ Plan the app to include others IoT devices, where reports about the user heartbeat rates are recorded during each VR experience and the level reached by the user are sent to her psychotherapist.
- ❑ The option search for the nearest psychotherapist using the GPS live location, where target department of hospital and close to the current patient's location will be displayed.



THANK YOU

---

