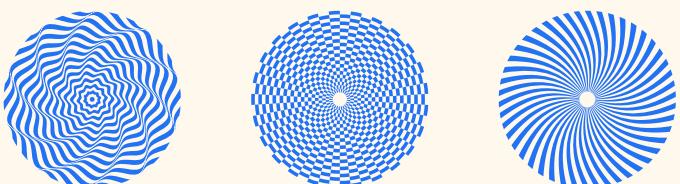


COMPUTER SCIENCE & DESIGN

Portfolio



by ANNET THOMAS

I am currently a Year 2 student studying Computer Science and am deeply interested in the field of web design.

LOGBOOK OF A VIRTUAL EMOTION DETECTOR

A logbook of an emotion detector that can recognize facial emotions in the layout of a magazine.

defining the problem

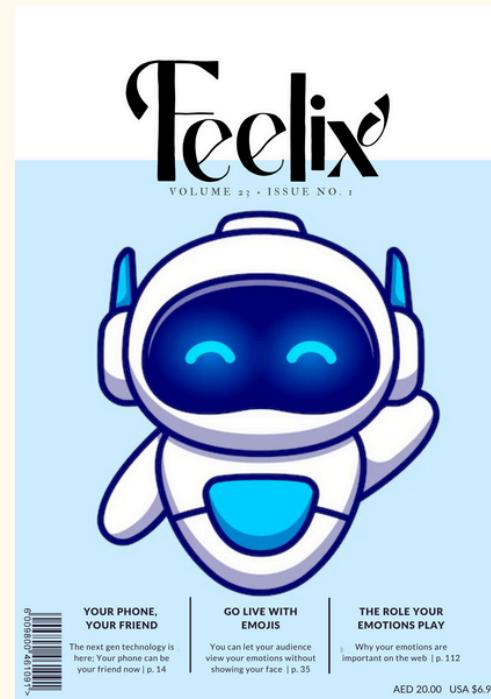


Today most of us live our lives virtually. Especially teenagers. But there are still a few places at times and so some of them might be conscious of sharing their faces. This has been an obstacle for them for years.

Almost everyone today has a smartphone. From a high schooler to grandparents. Its the one companion we have anywhere and everywhere. Yet sometimes we can't understand what we are feeling and might end up doing something we might regret.

The note the important issues faced by your school or community

In our school and community there are plenty of others who are looking to showcase talents or do interests. But their self consciousness and/or fear of being bullied stops them from doing so.



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PAGE 1
EDITOR'S NOTE
The making of the logbook in order to record various developments of the project.

PAGE 2
THE PROJECT PLAN
A timeline to structure the completion of the project within the given time frame.

PAGE 5
A COMPLETE PLAN TO COMMUNICATIONS
Look how we found ways to meet up and communicate with each other for the ultimate project.

PAGE 6
DEFINING THE PROBLEM
Understanding the problem at hand and refining the situation to focus at its core.

PAGE 7
KNOWING THE USERS
Identifying the target audience and looking through the issues that they face

PAGE 9
EMPATHY MAP
Navigating all aspects of our users' needs

PAGE 10
BRAINSTORMING
Generating ideas taking into account of the points of critical interest

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Outlining the deployment of the model in the real world

PAGE 14
DATA
A look through about how we came up with the coding of our program

PAGE 15
PROTOTYPE
Find out the different platforms we used to make our project running successfully

PAGE 16
TESTING
Get to know the different ways we tested the program and the most essential part of a project - feedback

PAGE 17
TEAM COLLABORATION
Looking back at our team and how we overcame difficulties in collaborating with each other.

PAGE 18
APPENDIX
Feedback grid from our evaluators

A COMPLETE PLAN TO COMMUNICATIONS

TEAM MEETING

Will you meet face-to-face, online or a mixture of each to communicate?
Mixture of both face-to-face and online

How often will you come together to share your progress?
4 days a week

Who will set up online documents and ensure that everyone is contributing?
Project Leader

What tools will you use for communication?
Zoom, WhatsApp

Things to do (what, by whom, by when)

1. Review of the main idea
2. Likely solution to the problem
3. Others' explanation regarding the problem
4. Finalize the main context of the project

Date of meeting:
06/04/2022

Purpose of meeting:

Items discussed:

1. Review of the main idea
2. Likely solution to the problem
3. Others' explanation regarding the problem

Things to do (what, by whom, by when)

1. Finalize the problem and its possible solutions
2. Research on data by the Data Expert
3. Reach to a final decision by 03/04/2022

MUST READ
EMPATHY MAP
ABOUT OUR USERS

1 What our users are saying
Have your self consciousness been an obstacle in sharing your talents on social media? 14 responses

Yes	No
36%	63%

2 What are our users are thinking
Would you prefer to talk without revealing your face on social platforms? 17 responses

No	Yes
47%	53%

3 What our users are doing
Are you comfortable in showing your face on social media, especially when going live? 10 responses

No	Yes
30%	70%

4 What are our users feel
Do you struggle with facial insecurities? 14 responses

No	Yes
57%	43%

Brainstorming Session

SNAPSHOTS:

Meenakshi Shibu
Project Leader
So I've been thinking about new ideas for AI project. I found this project about Spoiler Block Extension. It is super easy to make and has only a little code.
You and 2 people liked this.

Carthika Sujith
I think it's low value to users. How about a Sign Language Recognition App!

Fathima Yezdeen
But isn't hard to create. I just found another one - MBTI Personality Test

Nandana Rajesh
I think we should modify that a bit. Something like Personality Prediction through CVs.

Carthika Sujith
Isn't it a bit complex?

Annet Cecil
Information Researcher
Hey all, I got a cool idea. How about we do a project on Recognition of Facial Expressions. It has a lot of applications and is not that complicated!

Meenakshi Shibu
There a good one!

Fathima Yezdeen
That's a great idea!

You and 4 people liked this.

DESIGN

By Nandana Rajesh

The crux of our project is the insecurities people face in today's modern, rushed and brutal world that inhibit them from showcasing their true self and entertaining personalities. Social media, while being the platform to express ourselves and skyrocking our ventures, but it is indeed more a bane than a boon. Many a person has found a career by entertaining others, by comedy sketches, gaming, YouTube videos etc. With the praise, comes multiple slurs of hate.

These "hate" comments often aim to degrade the said person's physical characteristics and eat at the person's confidence. This is where our project comes in. Our project creates an effective in-between, a 'veil' of sorts that protects the person's identity, that allows them to express themselves while enabling the audience to concentrate on their talent rather than appearance. It would enable them to combat their inhibitions and bring their potential to light. It would enable them to see heights they were scared to dream and cushion the low.



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WBITES

Classics of China

Dhs. 85.00 AED

★★★★★ 1 Review

Dietary preferences: [Normal](#) [Soy-free](#) [Eggless](#) [Seafood-free](#) [Nut-free](#)

Quantity: [-](#) [1](#) [+](#)

37 in stock

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"Discover China's Timeless Flavors!" Immerse yourself in the culinary traditions of China with a carefully curated box filled with iconic snacks and

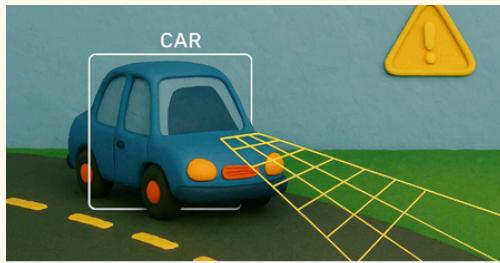
WEB DESIGN

An overview of an e-commerce platform to make shopping a more seamless experience, designed for the global snack industry.

<https://wbites.myshopify.com/>

PRESENTATION

A research presentation designed to present findings on a facial emotion detection system.



LITERATURE REVIEW ➤

- 1) HAAR CASCADE + ADABOOST ALGORITHM
Shofaha et al. (2024) used the Haar Cascade method with the AdaBoost algorithm for face detection with 95% accuracy indoors but only 72.8% outdoors due to decreased accuracy under factors like low light, shadows, and lighting changes.
- 2) VISION TRANSFORMER
Osmani et al. (2024) fine-tuned a Vision Transformer (ViT) model to detect driver drowsiness due to its exceptional ability to capture long-range dependencies in images. However, it only detects based on 2 eye states (open and closed). Drowsiness involves more than eye closure, like yawning, head nodding or blink rate.
- 3) WEARABLE EEG SENSOR
Kadu et al. (2024) employed wearable devices for fatigue and distraction detection. While they can capture biometric signals (e.g., heart rate, EEG, etc.), they are often uncomfortable over long durations, expensive and limited by driver compliance as well as environmental factors.

2025URCINTERSYS199

Real-time Facial Emotion Detection for Driver Behaviour Analysis and Road Safety

PRESENTED BY:
ANNET CECIL THOMAS
MELINDA SIMOES

PURPOSE:
UNDERGRADUATE
RESEARCH COMPETITION

A 3D rendering of a red car driving on a road. There is a traffic light showing red. Another car is visible in the background. The scene is set outdoors with a green field.

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LITERATURE REVIEW	➤
PROBLEM STATEMENT	➤
OBJECTIVES	➤
METHODOLOGY	➤
DATA & EXPERIMENTATION	➤
RESULTS	➤
CONCLUSION	➤

DATA & EXPERIMENTATION

An illustration of a car interior from the perspective of the back seat. It shows the driver's seat with a pink headrest and a small screen labeled 'Driver'. A camera is mounted on the dashboard, labeled 'Webcam'.

SETUP

The system is comprised of two parts:

- 1) **Hardware:** Includes webcams and various vehicle sensors for monitoring, braking, location etc.

- 2) **Software:** Includes the feature extraction algorithms and classifiers for detecting behaviour like distraction, fatigue, drowsiness and aggressiveness

DATA AUGMENTATION

Along with MediaPipe's FaceMesh for facial landmark detection and MobileNetV3 as the backbone CNN model for expression classification, various parameters are used to enhance the training procedure like:

- RandomResizedCrop
- RandomAdjustSharpness
- Adam optimization algorithm

DATASET

The model can be trained with the labelled dataset divided into 80% for training, 10% for validation, and 10% for testing, with a batch size of 50 for 100 epochs.

- **MiracIH8:** Participants under varied lighting in a driving simulation setup.
- **YawDD:** Includes 2160 labelled images using both dashboard and rearview mirrors to analyze yawns.
- **DEAP:** EEG and physiological signals recorded of participants who watched 40 one-minute clips.



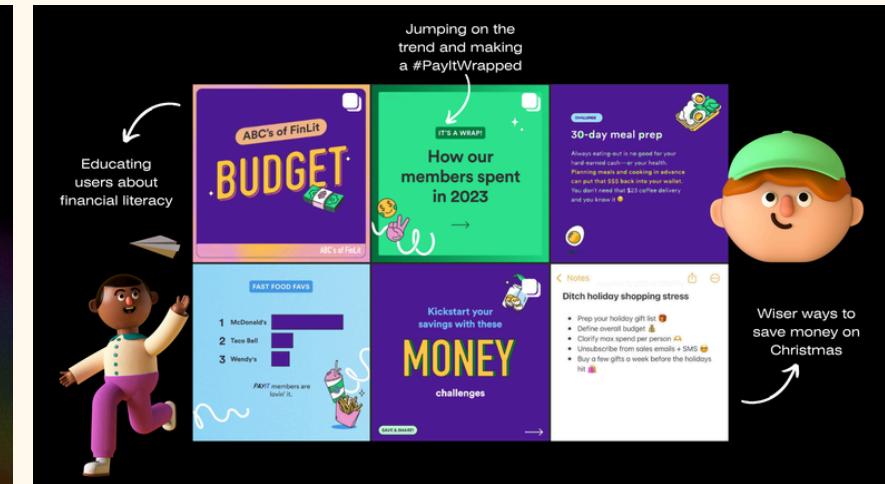
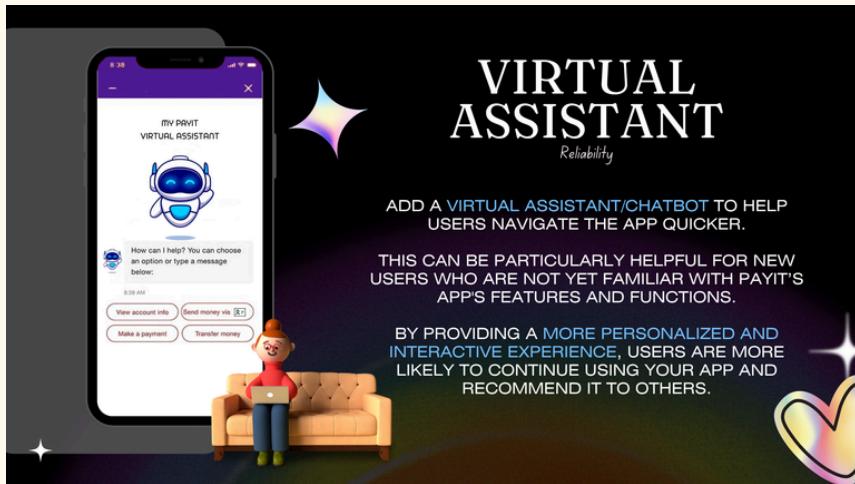
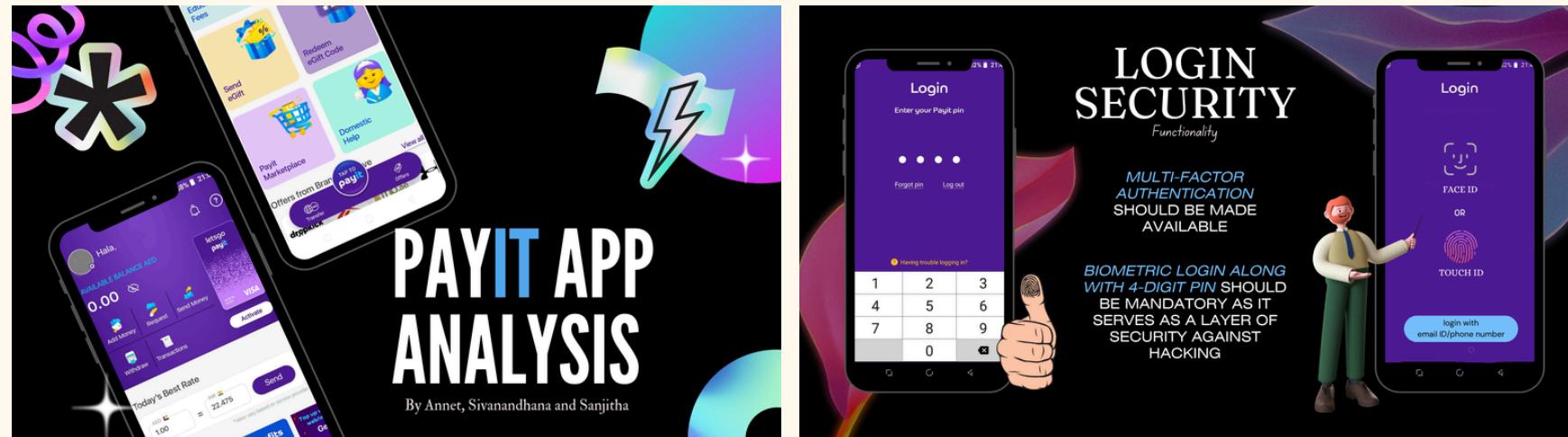
CONCLUSION

In this study, we have researched a **scalable, real-time, and non-invasive system** capable of providing actionable insights into driver behaviour to help reduce road risks.

By integrating advanced techniques such as **Convolutional Neural Networks (CNNs)**, **MediaPipe's FaceMesh** for precise facial landmark tracking, and **Long Short-Term Memory (LSTM) networks** for analyzing temporal patterns, the system captures more nuanced facial features beyond basic emotion classification.

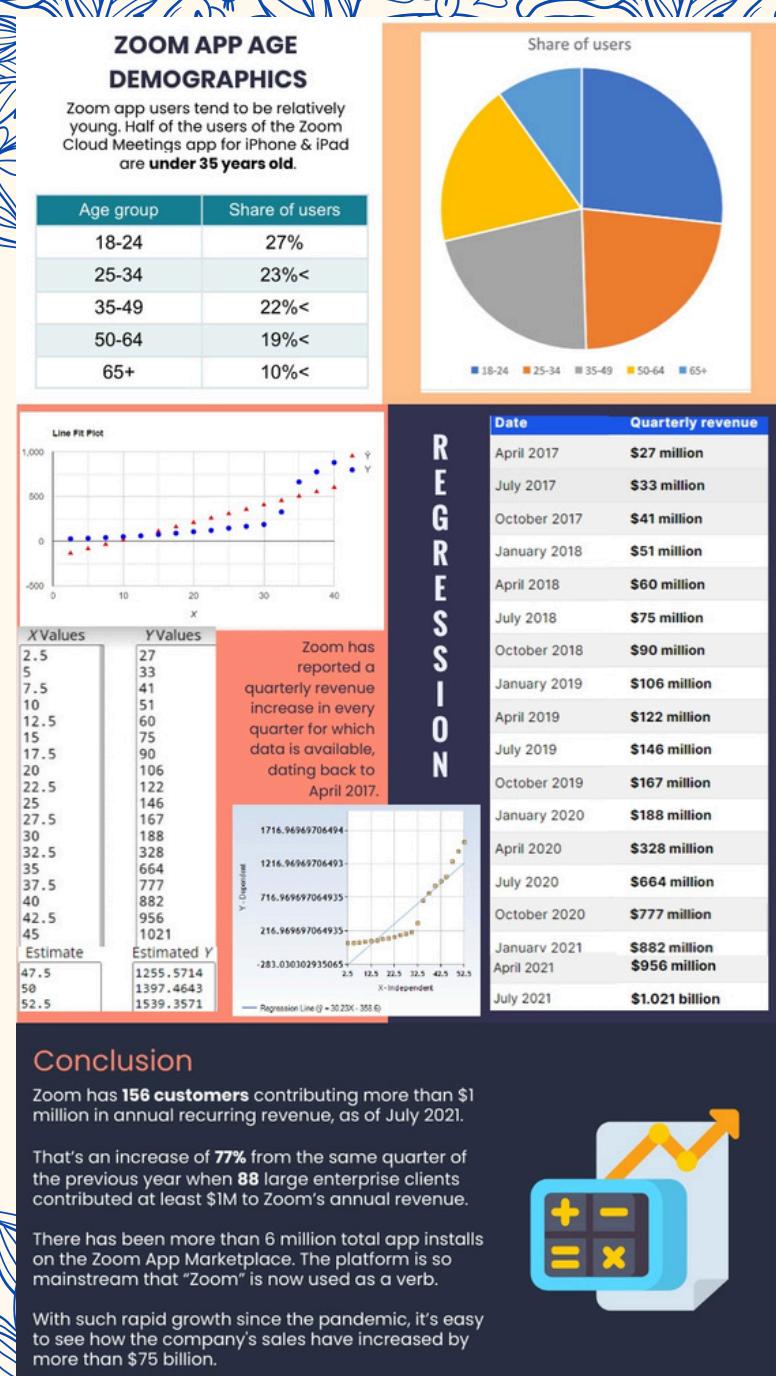
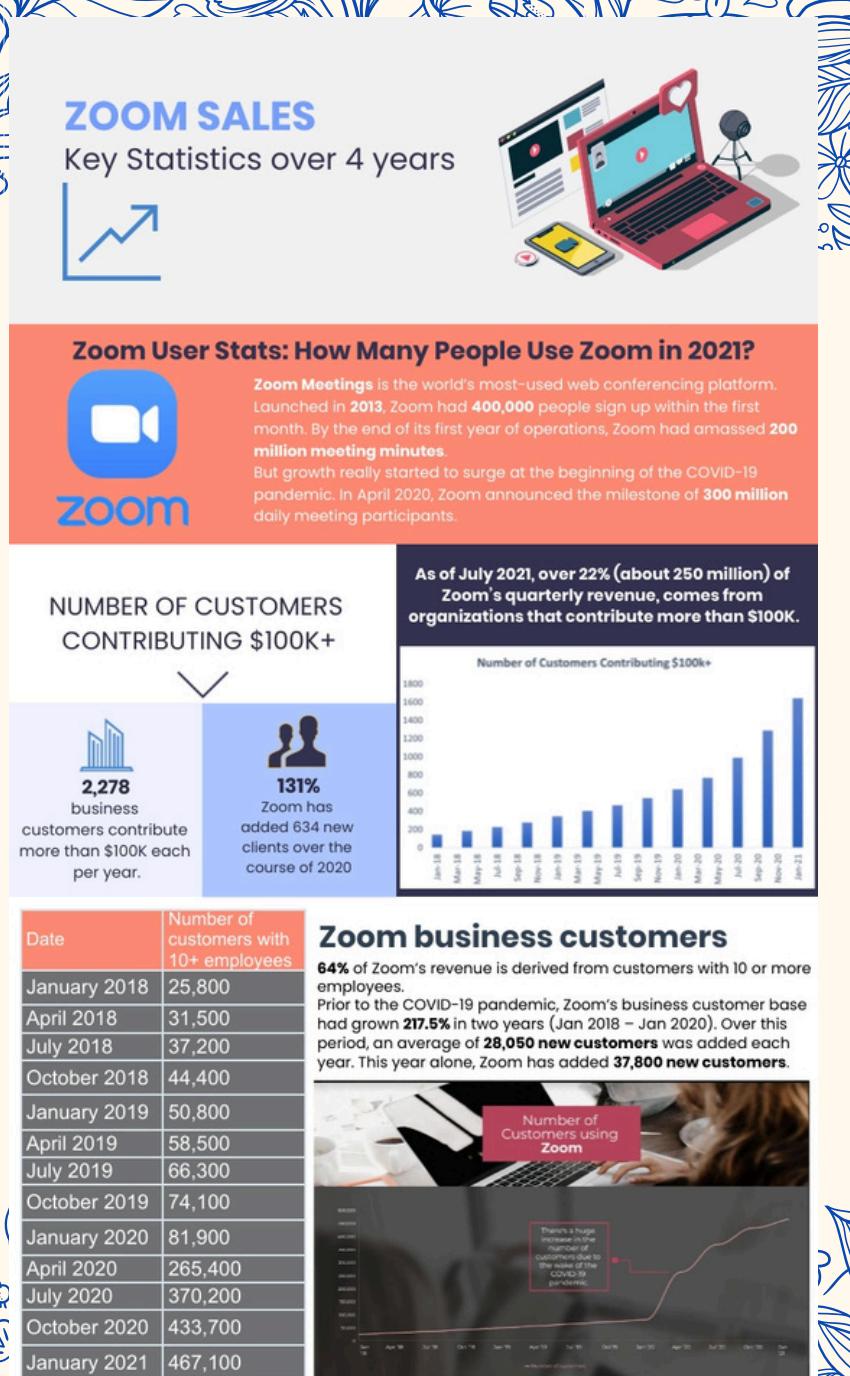
PRESENTATION

An overview of the AI features in an e-commerce platform to make shopping a more seamless experience.



DATA ANALYTICS

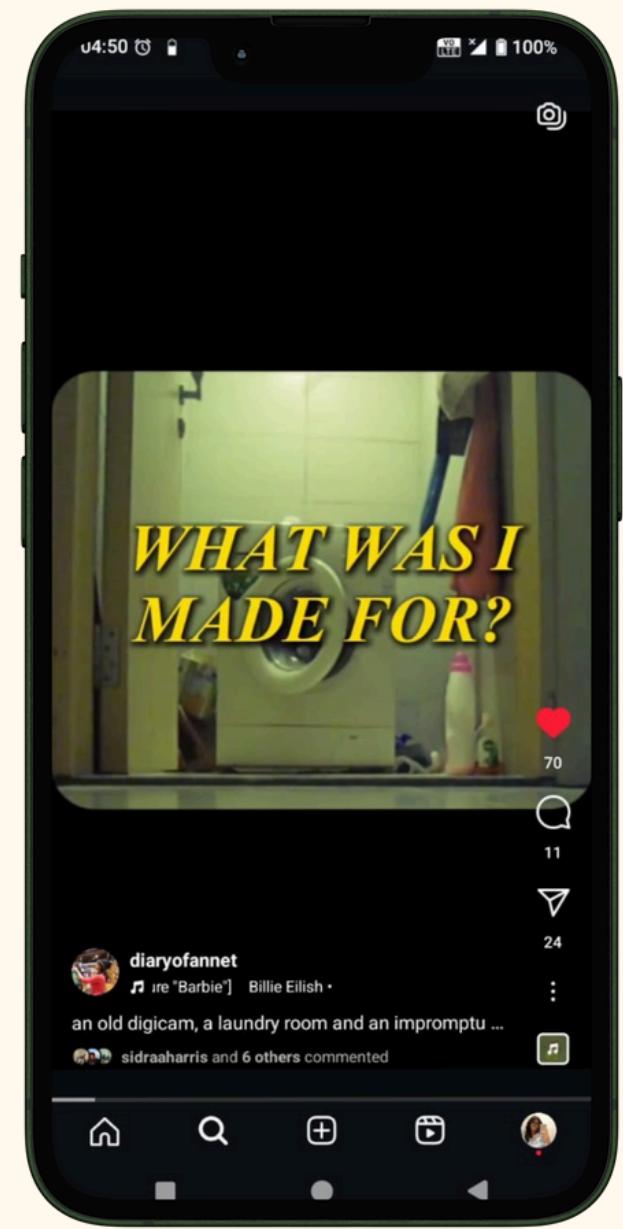
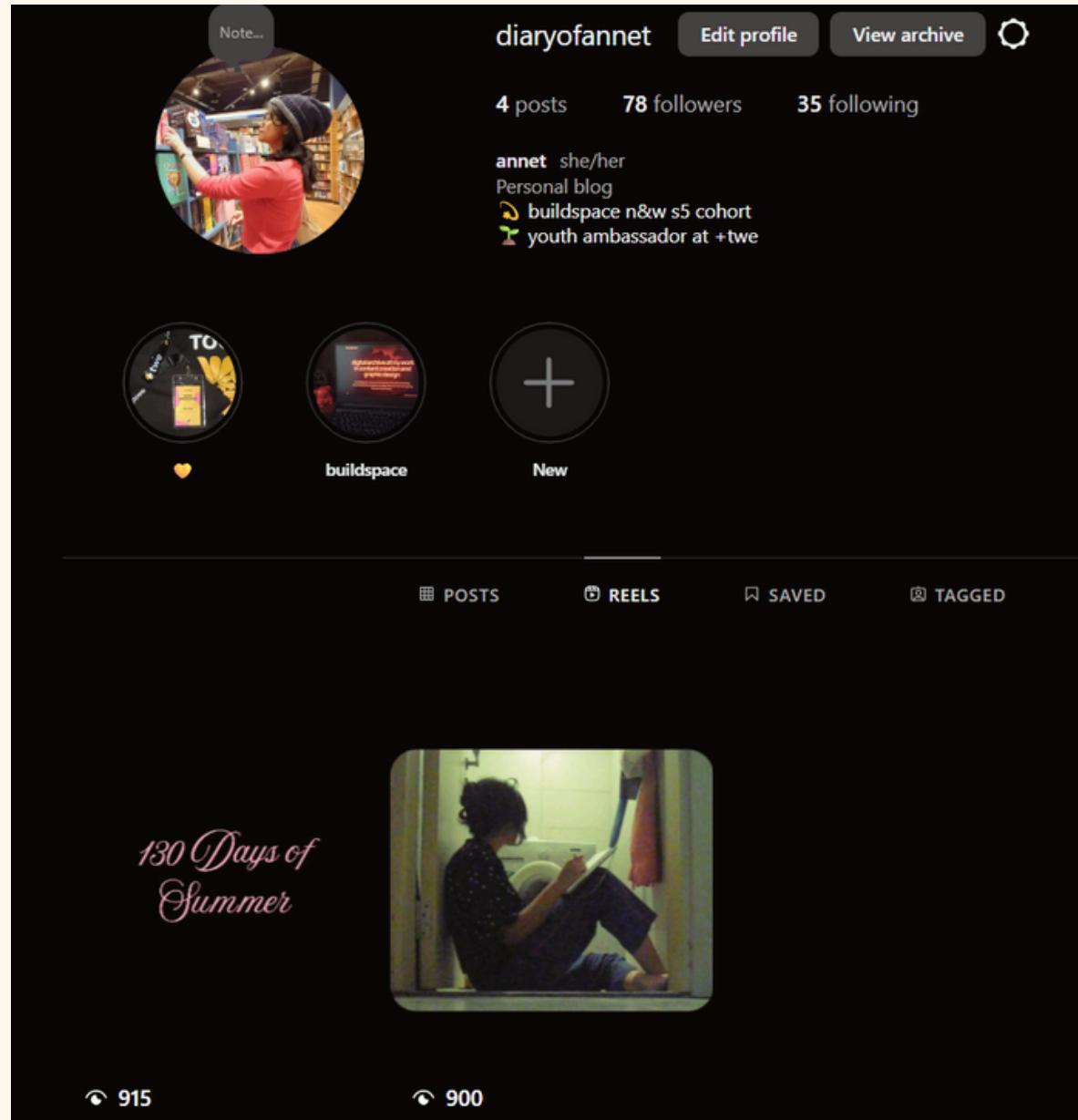
A visual representation of ZOOM's analytics and user statistics regarding the surge in sales and business customers at COVID-19's peak.



CONTENT CREATION

Self-projects shot during the course of buildspace about the time spent during summer break.

Reels bought in 900+ views.



COMMUNICATION DESIGN

A presentation informing the audience about the futuristic green jobs.

WORK ENVIRONMENT
Environmental geologists work in offices and laboratories. Some do fieldwork outdoors, and some must travel to meet with clients or present research findings.

SKILLS & COMPETENCIES

- Critical Thinking Skills
- Communication Skills
- Analytical skills
- Self-discipline

WHAT ARE GREEN JOBS?

Sustainability is a popular and growing field that attempts to integrate social science, environmental science and civil engineering to make the earth more sustainable.

Green jobs are jobs that contribute to preserve or restore the environment, be they in traditional sectors such as manufacturing and construction, or in new, emerging green sectors such as renewable energy and energy efficiency.

ENVIRONMENTAL ENGINEER

WHAT DOES AN ENVIRONMENTAL ENGINEER DO?

- An Environmental engineer uses knowledge of engineering, soil science, chemistry, and biology to solve problems in the environment.
- They tackle a variety of issues, and their concerns include pollution control, recycling, and public health issues.
- For example, an environmental engineer might work on devising solutions for effective wastewater management. This could include designing systems to treat industrial wastewater, manage municipal water supply, prevent waterborne diseases, and improve sanitation in cities, recreational areas, and rural locations.
- Make recommendations to maintain and improve environmental performance.
- Review environmental regulations, and determine whether they're being applied properly
- Report environmental incidents to plant management, including mishaps such as internal spills, external releases, potential permit non-compliances, and upcoming regulatory inspections
- Lead or support the preparation and negotiation of various environmental permit applications

LANDSCAPE ARCHITECT

WHAT DOES A LANDSCAPE ARCHITECT DO?

- A landscape architect designs residential areas, parks, shopping centres, parkways, golf courses, and school campuses to make them both beautiful and functional.
- Ensures that these facilities are compatible with the natural environment. Uses creativity and geographical data to combine infrastructure with the environment.
- Prepares site plans and graphic representations using computer-aided design and drafting software.
- Meet with and cultivate clients, engineers, and architects to outline possible solutions to problems and determine their needs.
- Consider environmental factors, such as draining and energy availability.
- Prepare cost estimates and oversee the project's budget.

WORK ENVIRONMENT

- Landscape architects spend much of their time in offices, where they create designs, prepare models, and meet with clients.
- They spend the rest of their time at job sites.
- A landscape architect might work with other professionals, including civil engineers, hydrologists, and architects.

Most landscape architects work in the architectural and engineering industry. Some work for landscaping service firms. About 20% of all landscape architects are self-employed.

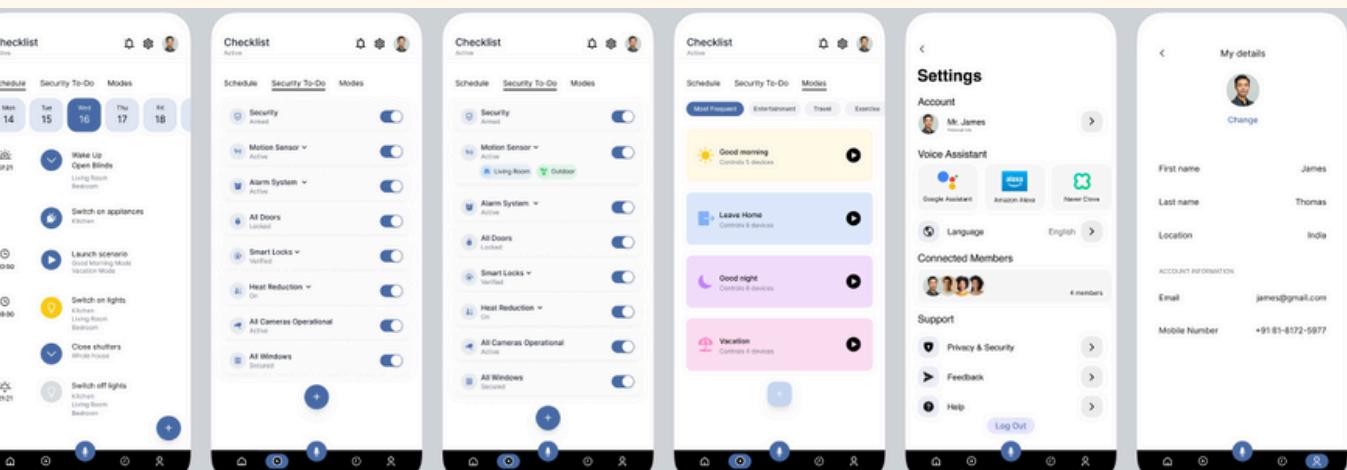
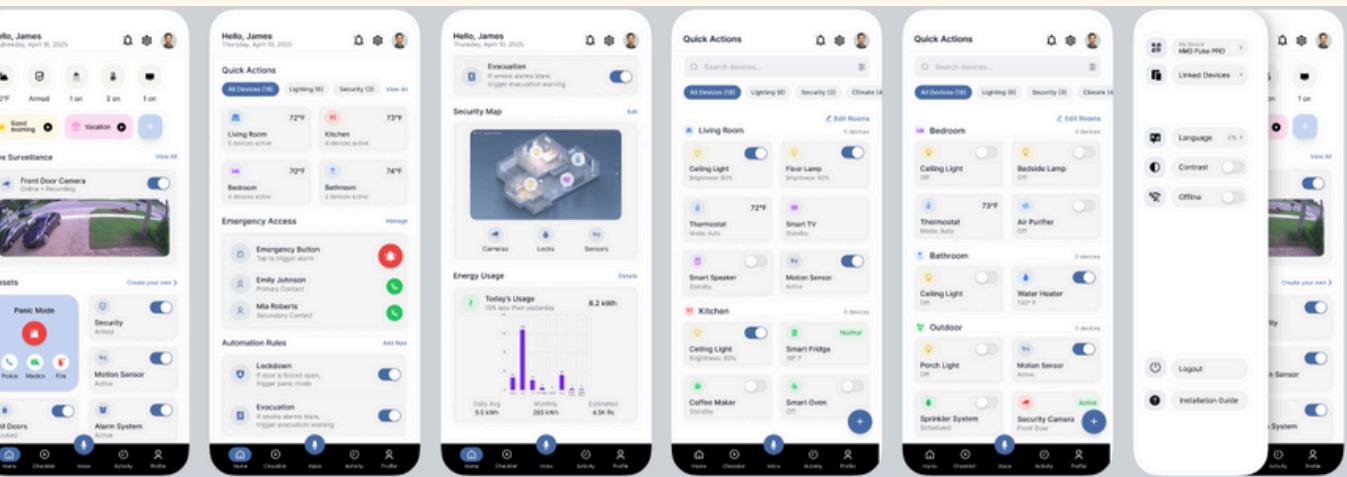
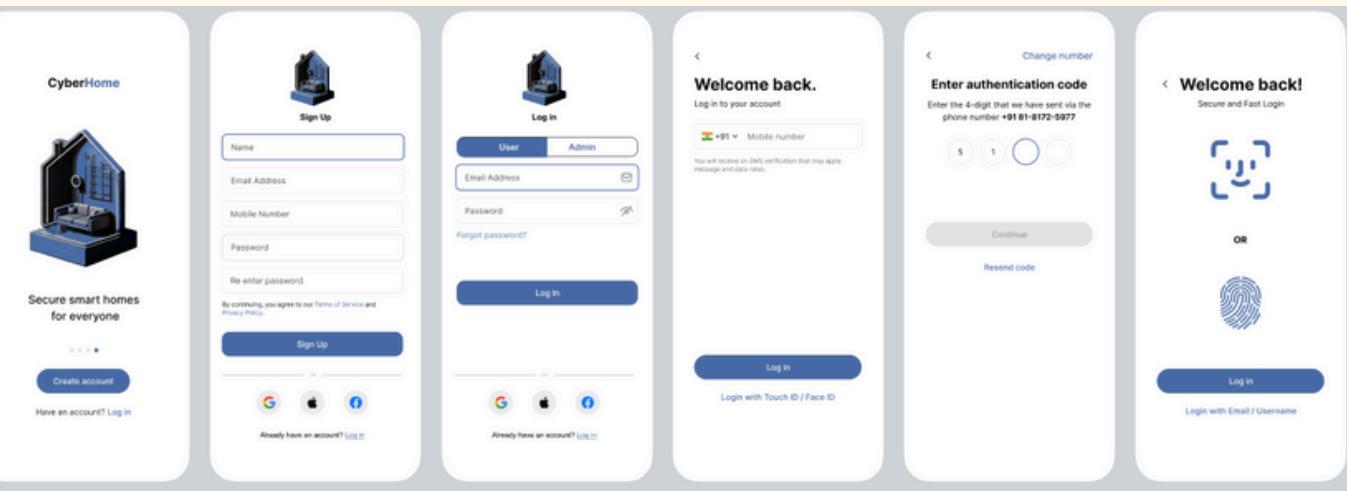
SKILLS & COMPETENCIES

- Active listening
- Creativity
- Critical thinking
- Reading comprehension
- Computer skills



MOBILE APP DEVELOPMENT

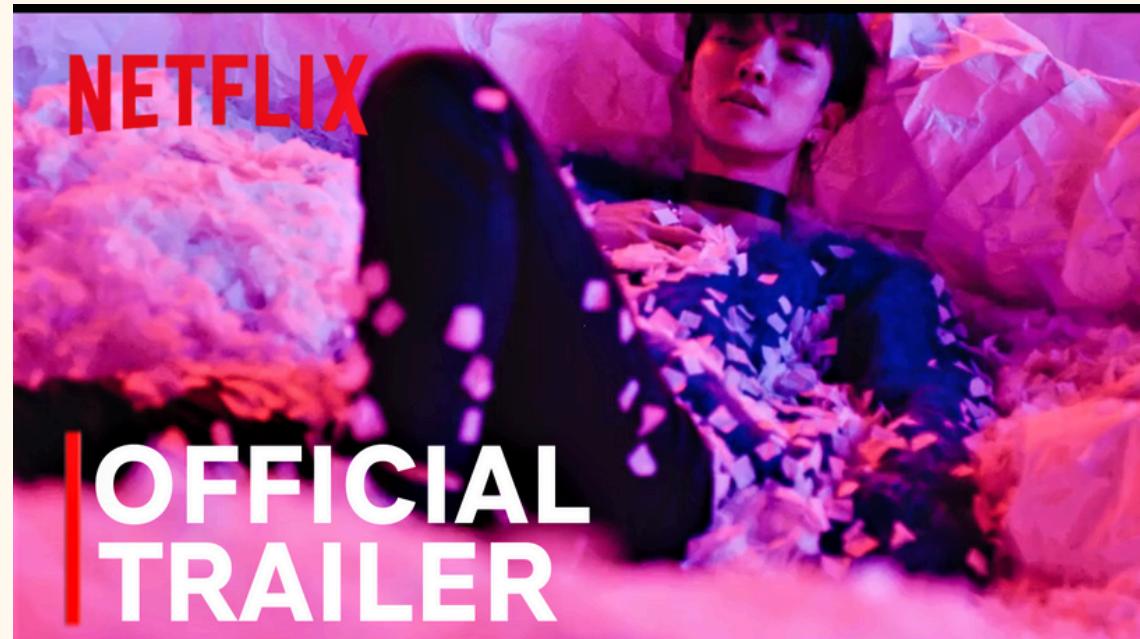
Interface designs and wireframes created on Figma for a smart home cybersecurity app.



VIDEO EDITING

A trailer designed in the style
of Netflix content.

<https://drive.google.com/file/d/1oSQ8-nuBOPXrhQvfrV4bnC5GN4bfQHuW/view>

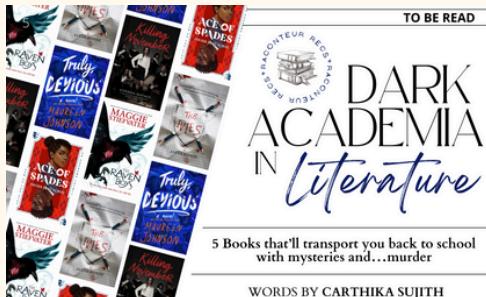
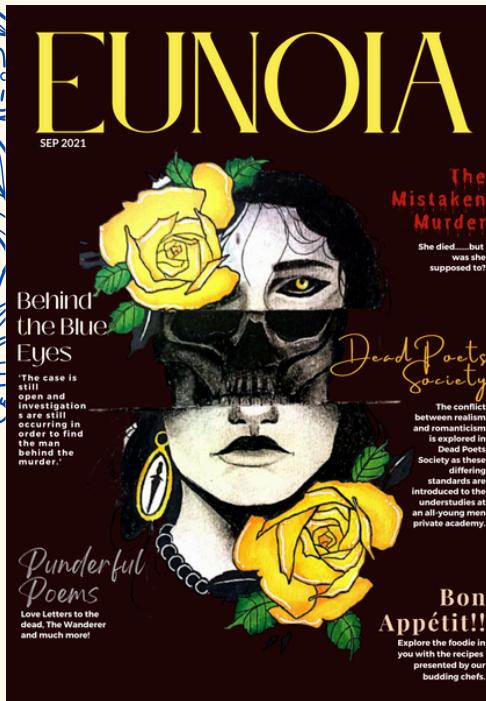


The screenshot shows the Netflix interface. At the top, the title "Time of Dogs and Wolves" is displayed in large white letters. Below the title is a synopsis: "The wolves have awakened. The full moon shines, once again terror fills District B. A pack of eleven: cold and fearsome, their night has come." On the right side, there is a close-up image of a person's face with a dramatic, moody lighting effect. The bottom of the screen shows a video player with controls for play, volume, and time (0:00 / 0:56). The Netflix logo is in the top right corner of the player area.



MAGAZINE

A magazine with various articles and poetry designed for a class project.



According to my sources, the theme for this issue is..... Dark Academia!*

cue Je sais pas danser by Pomme

Ooooh. This one's interesting.

Dark Academia refers to a new aesthetic style that draws inspiration from the classic Greek arts, writing, architecture, deeply infused with Gothic elements and concepts of death.

That's the dictionary definition. But if you're confused or want a visual image here's what it's like: a combination

of a vintage/boarding school aesthetic, a bookish sensibility, and a dark, slightly sinister vibe.

As a book genre, these novels take place in an academic setting and incorporate dark, tragic, satirical, and sometimes violent elements.

'Want a visual image? Here's what it's like: a combination of a vintage/boarding school aesthetic, a bookish sensibility, and a dark, slightly sinister vibe.'

The Secret History by Donna Tartt is often credited as the start of dark academia. (*It is an early '90s bestseller that follows a group of students at a New England liberal arts*

technology but the latest ones do have a lot. Moreover, there wasn't much diversity within the characters themselves. Nowadays authors are going outside the box, in order to build -- and topple -- empires.

3 **CONTENTS**

POETRY
Wanderer.....
WHAT'S ON THE TV
Dead Poets Society.....
A DOSE OF HISTORY
The Cynic.....

7 **POETRY**
Love Letters to the Dead

5 **TO BE READ**
5 Books that'll transport you back to school with mysteries and...murder

14 **AN UNSOLVED CASE**
The death of JonBenet Ramsey.

20 **STORY TELLER**
The Mistaken Murder
She died.... But was she supposed to?

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Chronic Roses

24 **FOOD**
Rose and Earl Grey Latte

18 **#HAUNTED**
The S.K. Pierce Mansion

17 **POETRY**
The Fallen

23 **CROSSWORD**
By Cathline

25 **FOOD**
Chocolate Glazed Donuts...

26 **LOL**
Memes and Where to Find Them

28 **RECOMMENDATIONS**
Songs, Webtoons, Movies and TV Series

28 **TRIVIA**
Guess Who I Am. Quizzes & Riddles

29 **COMIC TIME**
Artistic Endeavors

50 **MAGNUM OPERA**
Artistic Endeavors

51 **CROSSWORD**
By Arwa

6 **ARTISTIC ENDEAVORS**

3. Truly Devious by Maureen Johnson
A delicate tale of murder and mystery in the first book of a striking new series

5. The Ivises by Alexa Donne
A boarding school thriller about a group of prep school elites who would kill to get into the college of their dreams-literally.

4. The Raven Boys by Maggie Stiefvater
A spellbinding new series where the inevitability of death and the nature of love lead us to a place we've never been before.

If some of these leave you with any trust issues don't blame me. I have warned you. You may proceed under your own volition.

So let's begin our Dark Academia TBRs:

1. Ace of Spades by Faridah Abié-Jimídé
A contemporary thriller about two students, and their struggles against an anonymous bully.

2. Killing November by Adriana Mather
A thriller set at a secretive boarding school where students are trained to carry on family legacies that have built -- and toppled -- empires.

Art By Carthika Sujith

7 **Love Letters to the Dead**
WORDS BY ANNET CECIL THOMAS

How lovely it is to be hidden in the darkness!
Be a hopeless romantic one day,
And drown in your own thoughts the next.

Head deep down classical literature,
Yet your mind is full of thirst for murder.

Lurking through the shadows with another lover,
Who's found dead by your own hands at dawn.
You feel absolutely nothing with your soul,
Yet your heart is everywhere in your veins.

Broken hearts heal; they say,
Yet a heart that was broken by yourself never heals.

Dried flowers in your journal,
Love letters to the dead adorn each page.
You feel absolutely no remorse,
Yet your heart aches for each beautiful soul.

How hideous it is to be in the darkness!
Your heart pounding with fear,
Until you cease to exist.

PHOTO BY KRUTHI REDDY