



CSE 4839 | Human-Computer Interaction

Identifying Needs and Establishing Requirements

Measurement of Movie Popularity using Audiences' Facial Expression Recognition

Submitted By

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Submission Date

15 April 2022

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1. Methodology

1.1 Methodologies used for data gathering

- Direct Observation

We have gone to the 3 different movie theatres at 3 different times to observe the movie audience during movie playtime. During the observation, we have tried to note down the following factors:

- The attention of the audience watching the movie
- The facial expression of the audience watching the movie
- Frequency of talking to other audiences during the movie
- Frequency of leaving their seat

- Indirect Observation

We have tried to collect relevant data from stakeholders like Theater Intendant, Cleaning staff of a few other Movie Theaters. They provided us with:

- An estimate of people leaving their seats
- A pattern of in-theatre chatter
- An estimate of how many people watching the full movie

- Interview

We interviewed several people such as movie Cinema Hall Managers, Staff, Audiences and Movie Directors. We asked specific questions to each user type. This helped us know about their personal goals and frustrations which helped us design our required personas and scenarios.

- Study of existing literature

Factorized Variational Autoencoders for Modeling Audience Reactions to Movies. This paper formulated a new non-linear variant of tensor factorization using variational autoencoders, which they called Factorized Variational Autoencoders (FVAE).

After observing an audience member for a few minutes, FVAE was able to reliably predict that viewer's facial expressions for the remainder of the movie. Furthermore, FVAEs were able to learn concepts of smiling and laughing, and that these signals

correlate with humorous scenes in a movie. They used their approach on an audience facial expression dataset collected from an instrumented 400 seat theatre that hosted multiple viewings of multiple movies over a twelve-month period. This paper is a reference for our own system that will perform in a similar manner with some varying functionalities and applicability in mind.

1.2 Representative Users

We have chosen representative users based on the study of the aforementioned data gathering methods

- Movie Director
- Cinema Hall Manager
- Theater Intendant
- Movie Audience

2. Raw Data

According to our findings from the data gatherings, we have figured out the most salient information about the prospective users:

- Around 35% of the movie audience feel peer pressure while expressing their critics regarding the movie.
- Around 60% of the movie audience talked with their companion for a mentionable amount of time (>5 min) during the movie run time.
- Around 90% of movie directors and producers are frustrated with the fake reviews regarding their movies.

3. Personas

Persona 1

Muhtasim Abedin

Representative of

- Promising movie director
- Dreamer to create an oscar winning movie

Muhtasim Abedin

Personal Details

Age: 35
Work: Movie Director
Family: Married
Location: Dhaka, Bangladesh

Bio

Muhtasim Abedin is a promising movie director who has already produced and directed 10+ Bengali movies. He is planning to come up with a very big budget movie in the upcoming years. His aim is to create a movie that will take him to the podium of the Oscar Award.

Preferred Channels

Newspaper
Social Media
Fashion Magazines
Physical Events

Motivation

History
Fantasy
Art Film
Horror
Rom-Com
Musical

Goals

- Make highly reviewed movies
- Receive an Oscar award
- Get more offers from producers
- Be a Netflix God


Frustrations

- Unable to get honest movie reviews from the audiences.
- Failure to create an international standard movie




Personality

Introvert
Analytical
Loyal
Passive
Extrovert
Creative
Fickle
Active

Creative
Dreamer
Dependable



"I want to receive an IMDb 9+ rating on my movies"



Persona 2

Maysha Khan

Representative of

- Passionate Cinema Hall Manager
- Successful Business Person

Maysha Khan

Personal Details

Age: 49
Work: Cinema Hall Manager
Family: Married
Location: Dhaka, Bangladesh

Bio

Maysha Khan is one of the most dependable Cinema Hall managers in Bangladesh. She plans to enhance the theatre experience. A great business mind, she knows how to profit.

Preferred Channels

Newspaper
Social Media
Fashion Magazines
Physical Events

Motivation

Customer Satisfaction
Premiumness
Family Friendly
Interior
Cinema Hall Infrastructure
Marketing

Goals


- Establishing the most profitable cinema hall franchise in Bangladesh
- Better customer service in the cinema hall

Frustrations




- Unable to get proper reviews from the audience regarding the environment of the cinema hall

Personality

Introvert
Analytical
Loyal
Passive
Extrovert
Creative
Fickle
Active
Leader
Professional
Achiever



"I want to run the most profitable cinema hall franchise in Bangladesh"



Persona 3

Ershad Nafis

Representative of

- Young theatre Intendant to ensure high quality experience for movie audience

Ershad Nafis

Personal Details

Age: 21
Work: Theater Intendant
Family: Single
Location: Rangamati, Bangladesh

Bio

Ershad Nafis is a full-time student with a part-time job at Theater Intendant. Cinema is his passion so being a theatre intendant helps him to stay updated with the latest released movies.

Preferred Channels

Walkie Talkie

Social Media

Fashion Magazines

Physical Events

Motivation

Customer Satisfaction

Customer Support

Family Friendly Theater Environment

Theater Interior

Get Free Tickets

Watch Free Movies

Goals

- Ensuring quality time for the audience during the movie time
- Getting promoted to manager
- Watch free movies

Frustrations

- The audience does not follow instructions

Personality

Introvert

Extrovert

Analytical

Creative

Loyal

Fickle

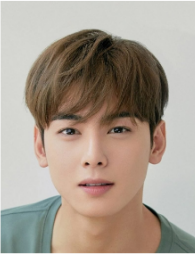
Passive

Active

Rule Follower

Professional

Instructive



"I want our clients to have the best experience"

MARVEL

WB

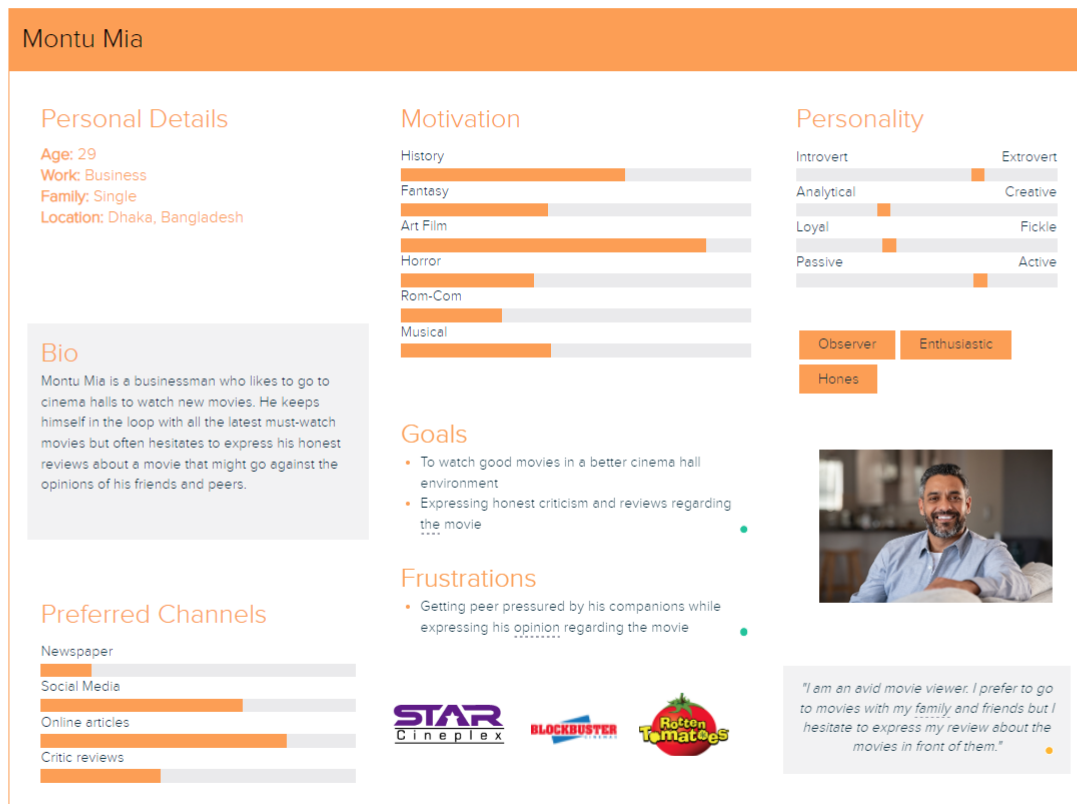
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Persona 4

Montu Mia

Representative of

- Avid movie watcher



4. Scenarios

Scenario 1

Muhtasim Abedin wants to know which scenes attract the general audience.

Event: The movie director wants to know which scenes attract the general audience

Participant: Muhtasim Abedin

Goal: To understand which scenes work well with the audience and make a great film that brings in more audience and better reviews.

Muhtasim Abedin wants his films to reach great heights and he want to make an Oscar worthy film. But the movies he made so far were mediocre at best but had their shining moments. So he wants to know which type of scenes and story paths worked well for his previous films so he could incorporate them and make a film to remember. So he runs some of his previous films in a theatre and uses our system to analyze the audiences' expressions to find out which points and scenes in the films stood out and note them. He plans to integrate the ideas he found through this method to make a film in the near future.

Scenario 2

Maysha Khan is trying to know which movies to feature.

Event: Cinema hall manager wants to know which movies to feature

Participant: Maysha Khan

Goal: To know which type of films audiences prefer to watch and leave with a good review from the hall so she could feature movies of similar type in the future.

Maysha Khan wants to build the most successful cinema hall franchise in the country. So she wants to know what kind of movies she should feature in her theatres which would bring in more audiences and thus increase the profitability of the business. She starts using our system in her cinema halls to analyze how the audiences feel about the movies currently being shown. Based on this analysis, she decides on the type of movies to feature in the future which would be best for business.

Scenario 3

Ershad Nafis wants to manage the theatre effectively.

Event: Theater intendant wanting to effectively manage the theatre

Participant: Ershad Nafis

Goal: To know the how the audiences are feeling and evaluate the overall environment during showtime and take steps accordingly for managing the theatre

Ershad Nafis wants to manage the theatre he's intending to in a more effective way and so he decides to use our system to know how the audience is reacting to the movie and based on the overall environment, he would take necessary steps mid-show to manage the theatre and uplift the theatre environment using various amenities.

Scenario 4

Montu Mia wants to be assured that his honest review of the movie is delivered

Event: The movie watcher wants the relevant people to know about his honest opinion on the movie

Participant: Montu Mia

Goal: To be assured as a movie watcher that the director and relevant people get to know about the honest review and opinion on the movie

Montu Mia decides to watch the newly featured movie in the cinema hall that he visits often. He also wants that the producers and directors should get to know about how the movies are performing so he can get to watch even more good movies in the future. So he agrees that the hall should use our system to analyse his and the entire audiences' facial expression during showtime so that honest reviews of the movie can be delivered to the relevant people because he knows that people often become biased by friends and social media when giving reviews on a movie after watching it.

5. User Requirements

Features the system will provide

- The system will capture the facial expressions of the audience throughout the movie playtime. Night vision cameras will be used to capture as the movie theatre remains dark. The camera will take the live feed of the facial expressions of the audience.
- The system will classify the facial expressions and will give an overall decision on how much the audience is enjoying the movie.
- The system will show the percentage of the audience who liked the movie and vice versa.
- The system will inform which part of the movie was enjoyed most by the audience.

Features the system will not provide

- The system will not provide any results to the movie audiences.
- The system will not generate any alerts.
- The system will not give any decision on whether the movie should be played or not in the future.

How the features are related to the personas

The movie director and producers invest a good amount of money while creating a movie. Again, whenever a hall manager decides to play any movie in his hall, it costs him a mentionable amount of money.

The success of any movie can be judged based on the opinion of the audience. If the audience likes the movie, the show is supposed to generate revenue for the movie producers, directors and hall managers. Again, if the movie fails to meet the expectation of the audience, it is bound to flop.

It is not possible to know the opinion of all the audiences in a manual method. This method is time-consuming, cost-inefficient and biased. Failure to collect authentic reviews from the audience is causing loss to the stakeholders. Again, the users are providing fake reviews facing peer pressure.

Our facial expression recognition system will help the movie directors, producers and cinema hall managers to know about the acceptance of any movie from the audience.

6. References

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