



HistoMind AI-Powered Historical Place Navigator

23-378



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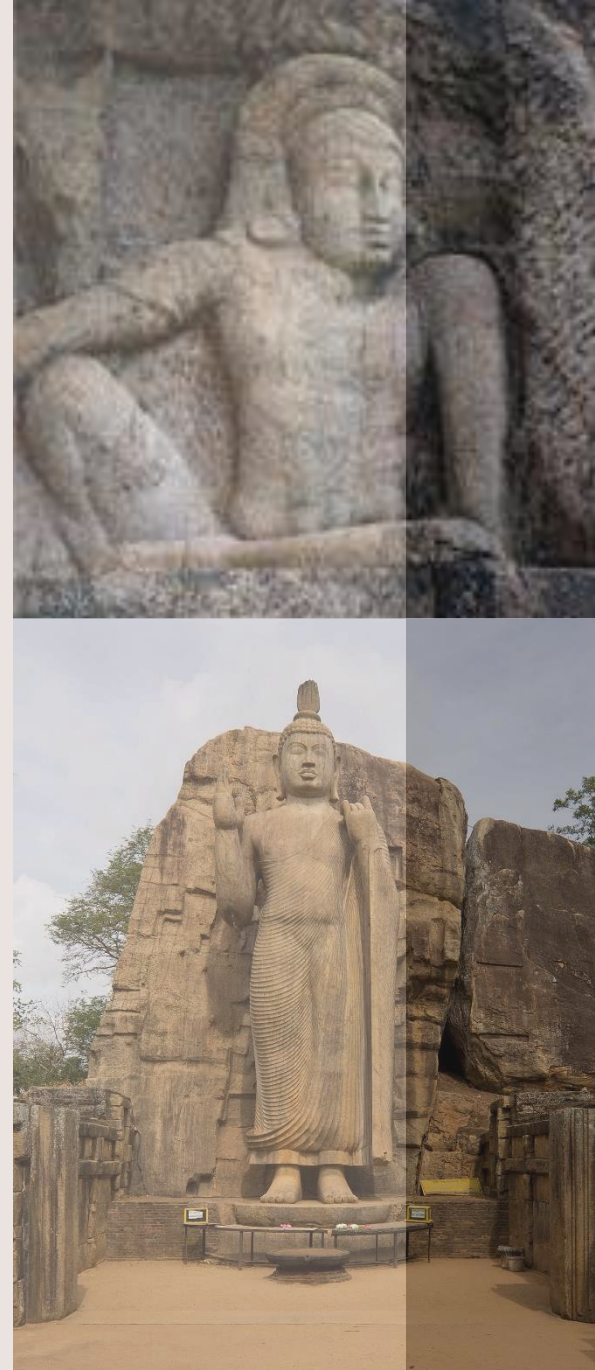
Research Problem

Sri Lanka's historical sites vital for economy.

COVID-19 caused tourism decline, needs revival.

Lack of software and innovation for promotion.

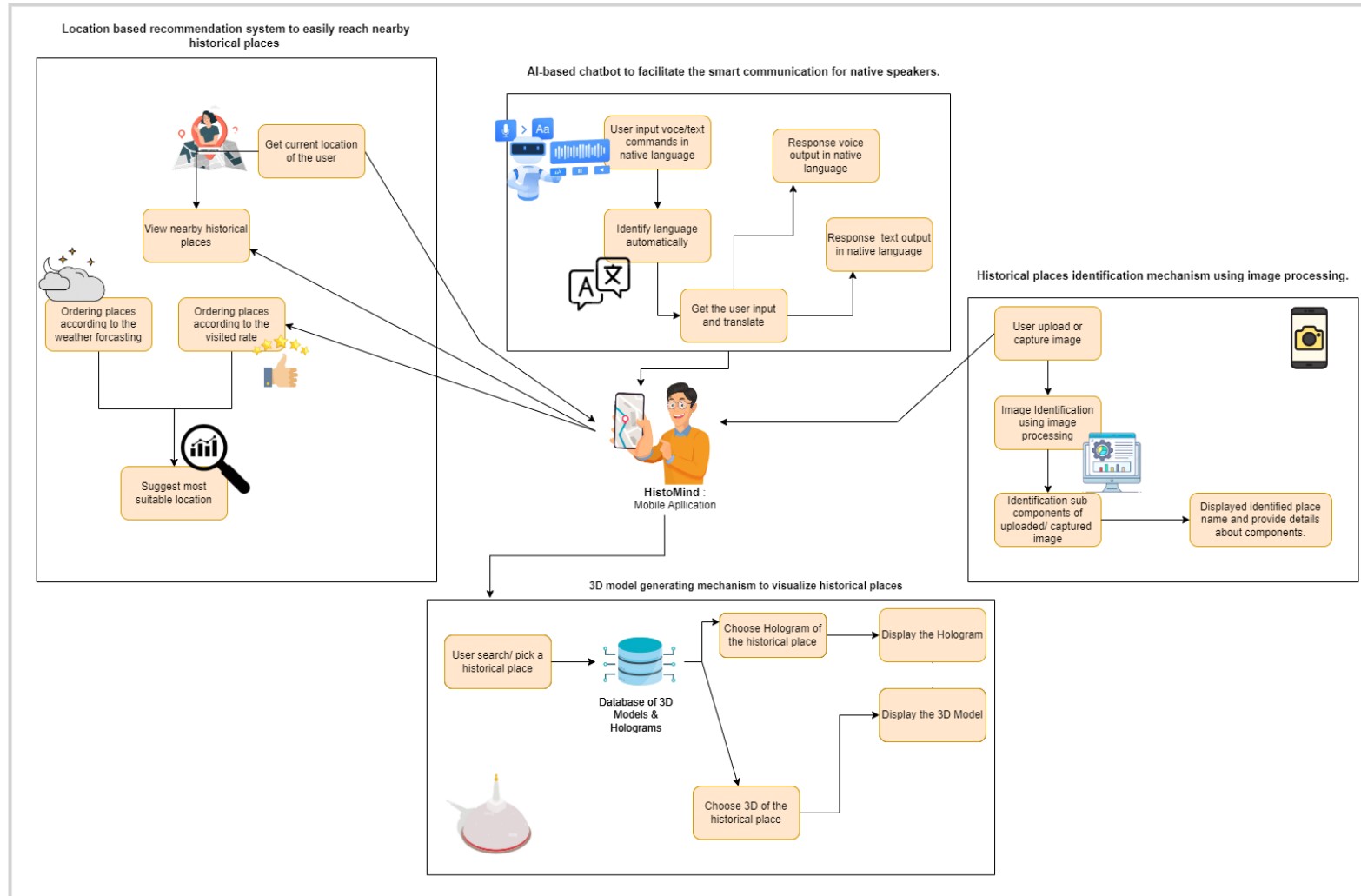
Enhance historical site visibility, affordable travel.



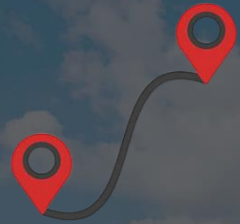
Research Objectives

- Enhance Sri Lanka's historical site tourism.
- New approach: Location-based recommendation with route planner, AI chatbot, 3D modeling, image identification.
- Comprehensive travel solution, local communication.
- Realistic virtual showcase, identify historical sites.
- Boost tourism, elevate economy.

System Overview Diagram



HistoMind Consists of...



Smart Location-Based Recommendation Mechanism With Route Planner

Smart Historical places identification mechanism using image processing.



AI based chatbot to facilitate the smart communication for native speakers

3D model generating mechanism to visualize historical places.

Paper Submission

11/11/2023

Author Console

Please click [here](#) to view Welcome Message & Instructions.

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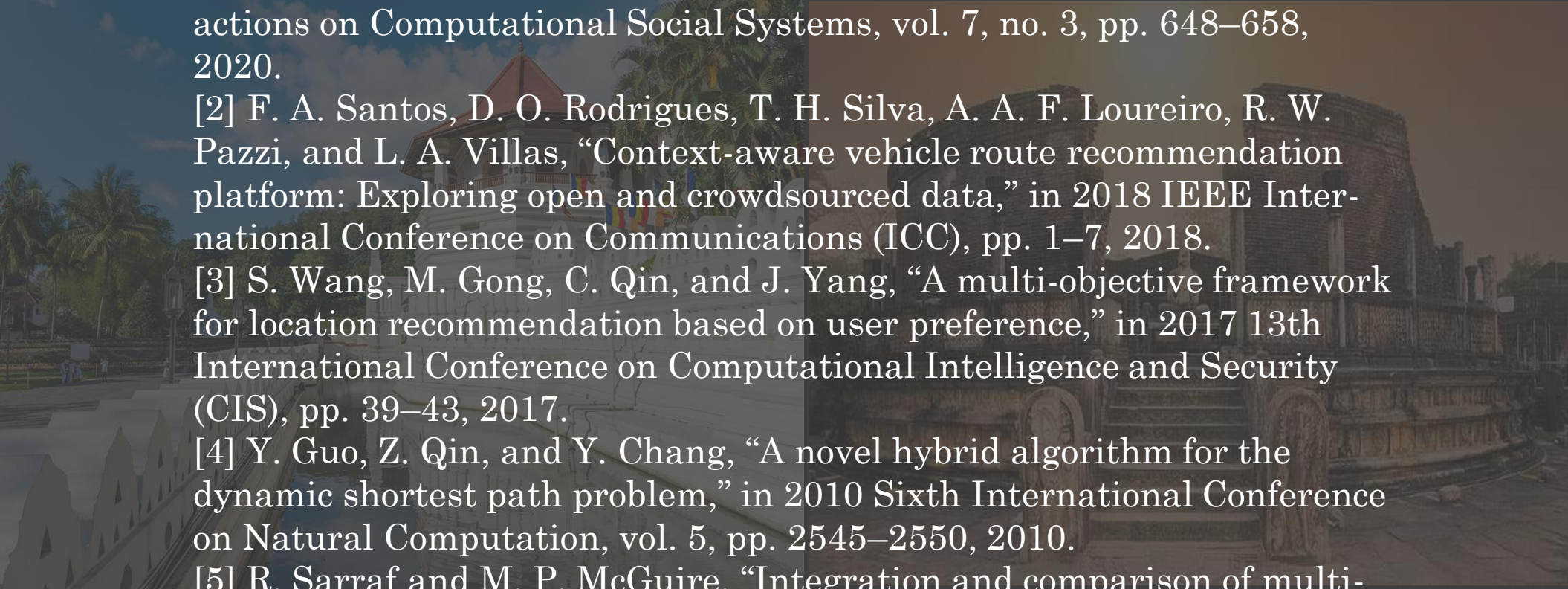
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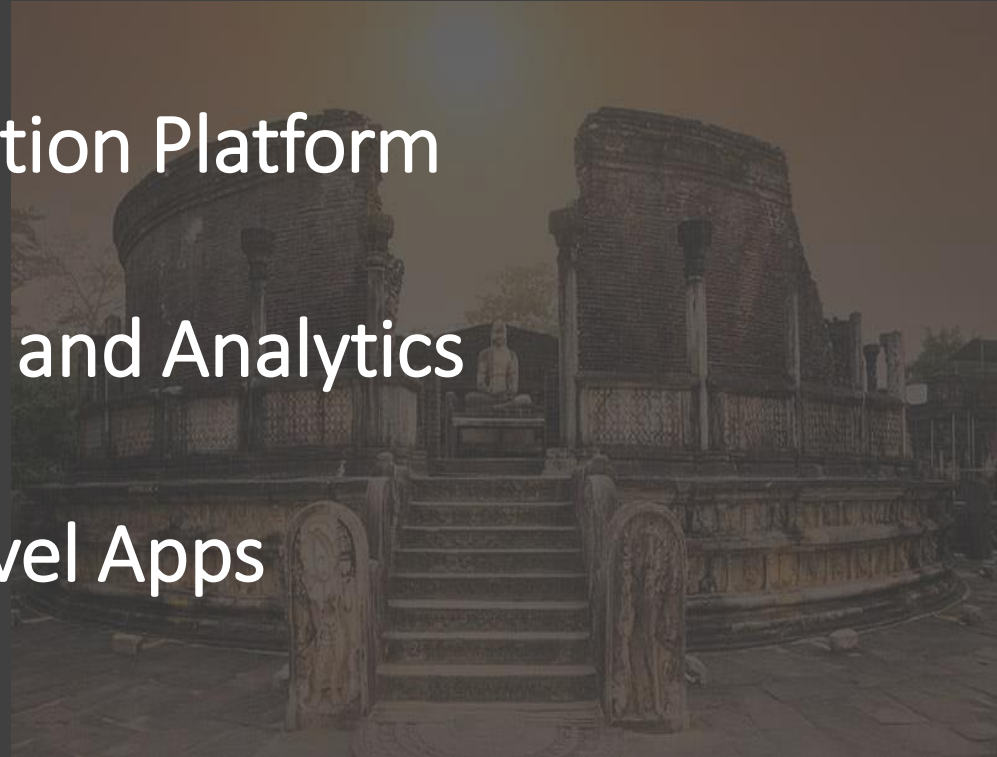
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383	HistoMind: AI-Based Historical Place Navigator Show abstract	Advances in AI and ML	Submission files: ⬇ HistoMind_AI_Based_Historical_Place_Navigator.pdf

References

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- [1] Z. Huang, X. Lin, H. Liu, B. Zhang, Y. Chen, and Y. Tang, “Deep representation learning for location-based recommendation,” *IEEE Transactions on Computational Social Systems*, vol. 7, no. 3, pp. 648–658, 2020.
- [2] F. A. Santos, D. O. Rodrigues, T. H. Silva, A. A. F. Loureiro, R. W. Pazzi, and L. A. Villas, “Context-aware vehicle route recommendation platform: Exploring open and crowdsourced data,” in *2018 IEEE International Conference on Communications (ICC)*, pp. 1–7, 2018.
- [3] S. Wang, M. Gong, C. Qin, and J. Yang, “A multi-objective framework for location recommendation based on user preference,” in *2017 13th International Conference on Computational Intelligence and Security (CIS)*, pp. 39–43, 2017.
- [4] Y. Guo, Z. Qin, and Y. Chang, “A novel hybrid algorithm for the dynamic shortest path problem,” in *2010 Sixth International Conference on Natural Computation*, vol. 5, pp. 2545–2550, 2010.
- [5] R. Sarraf and M. P. McGuire, “Integration and comparison of multi-criteria decision making methods in safe route planner,” *Expert Systems with Applications*, vol. 154, p. 113399, 2020.

Commercialization

- Tourism Recommendation Platform
- Destination Marketing and Analytics
- API Integration for Travel Apps





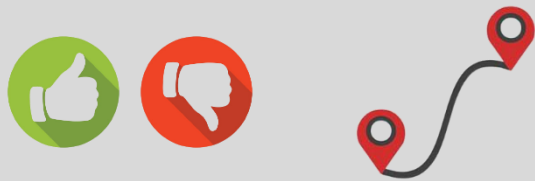
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Smart Location-Based Recommendation Mechanism With Route Planner





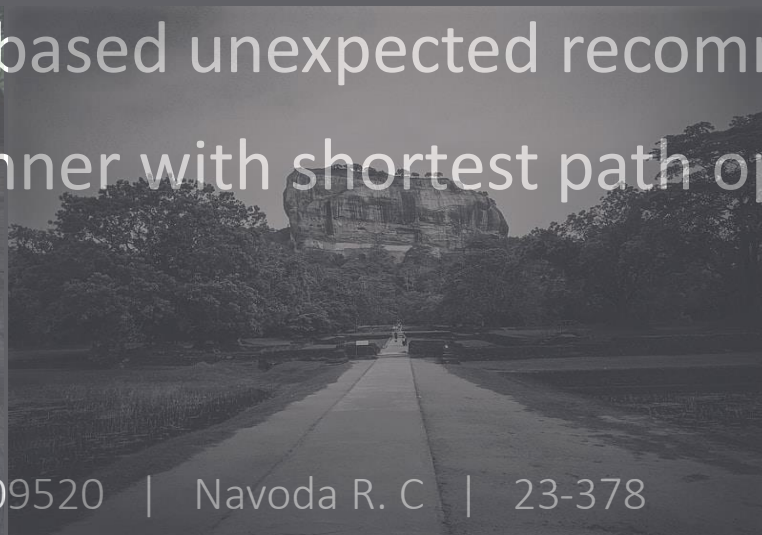
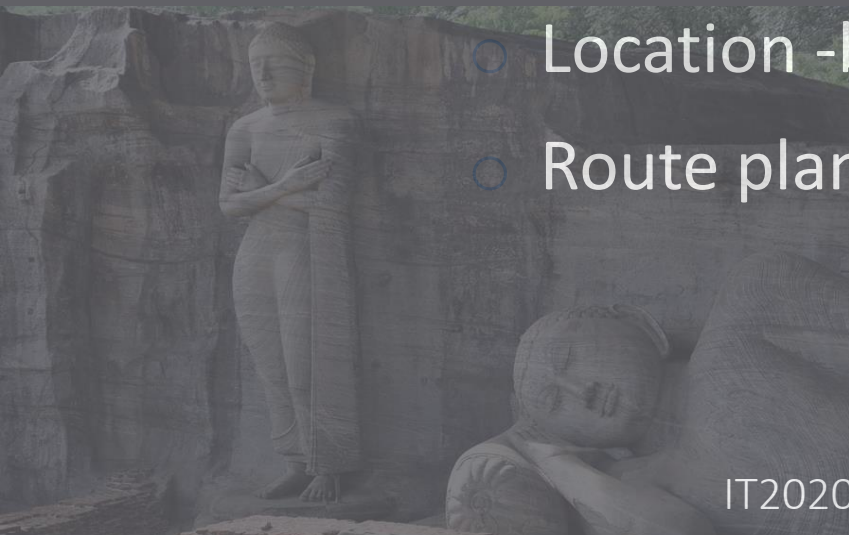
Research Problem

- Limited software solutions
- Lack of cost-effective trip planning



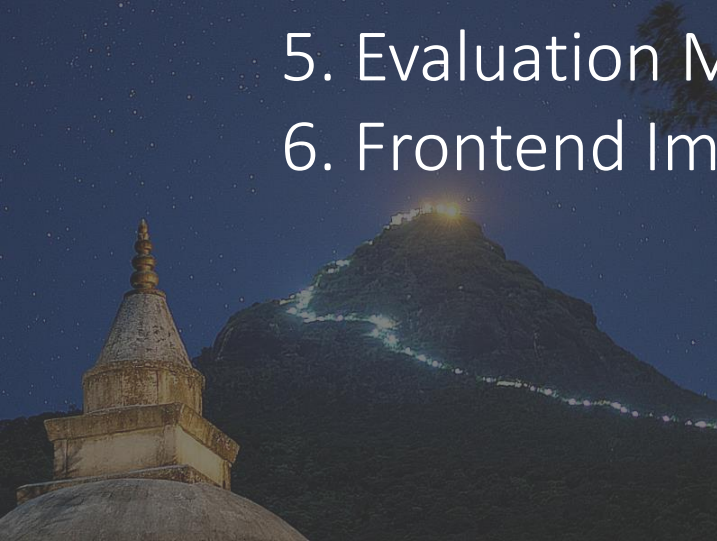
Specific and Sub-Objectives

- Location -based recommendation based on single user preference.
- Location -based hybrid recommendation based on community preference. (Ratings/Reviews)
- Combined recommendation.
- Location -based unexpected recommendation.
- Route planner with shortest path optimization

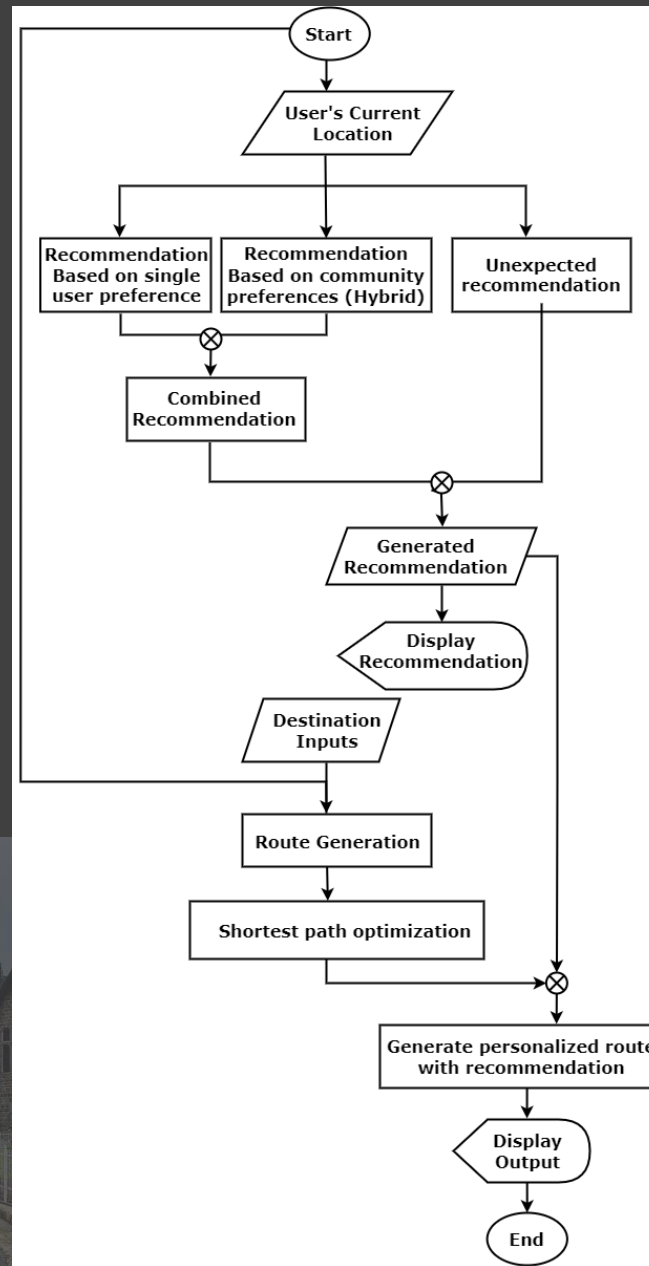


Methodology

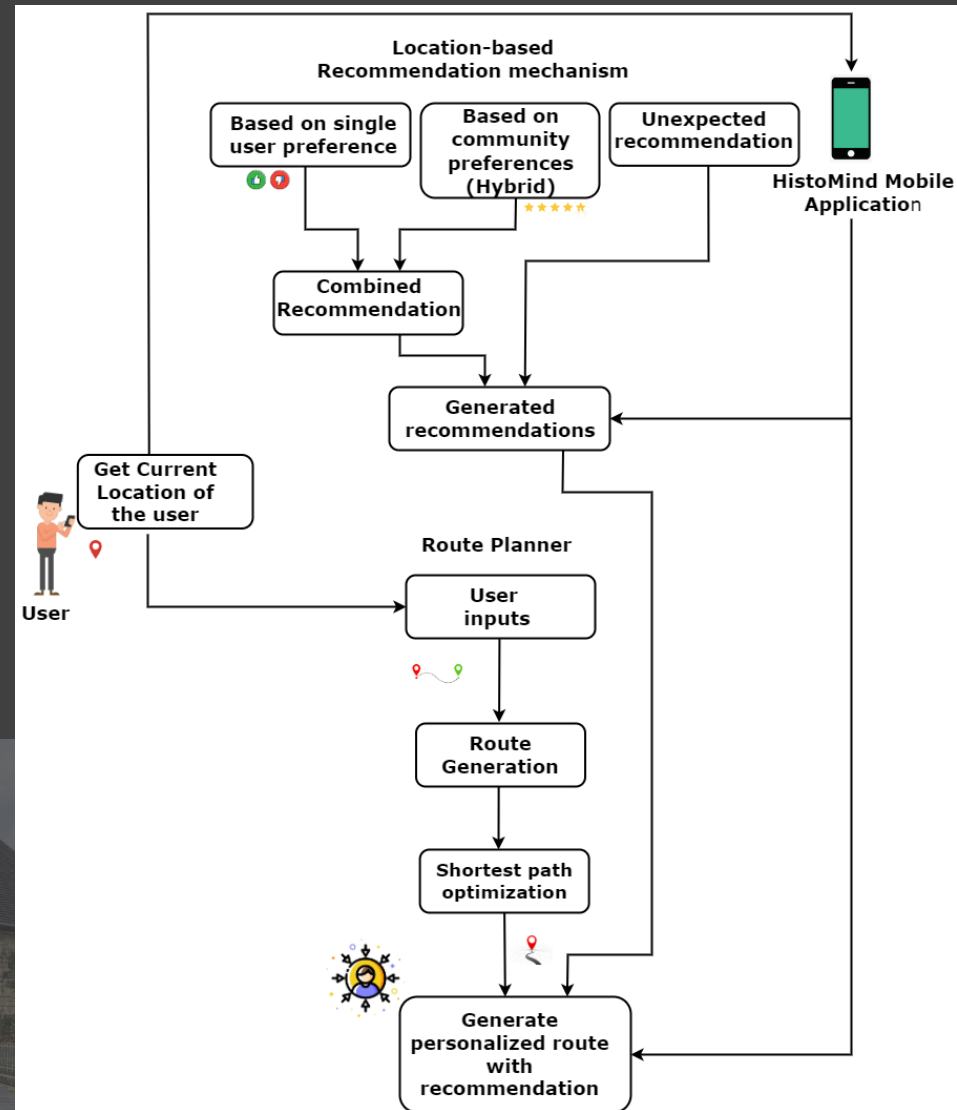
1. Data Collection
2. Data Preprocessing
3. Machine Learning Model Training
4. Model Evaluation
5. Evaluation Metric
6. Frontend Implementation
7. User Input Handling
8. Backend Processing
9. Response to Frontend
10. User Interaction
11. Recommendations Display



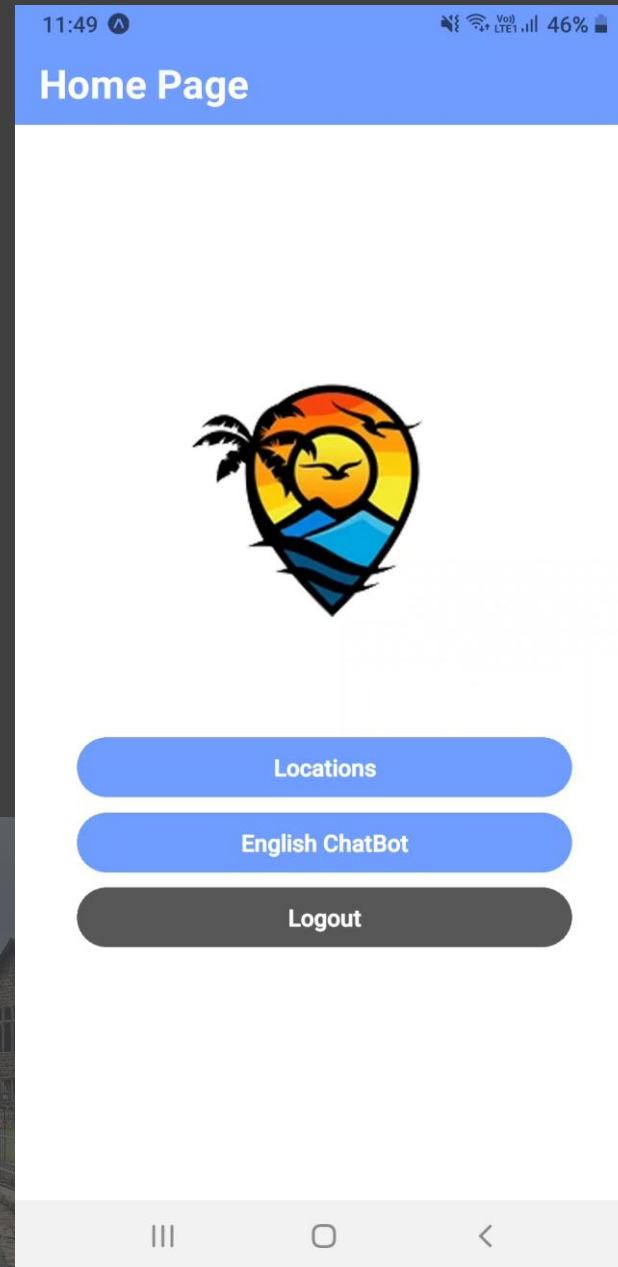
Flow Chart



System overview diagram

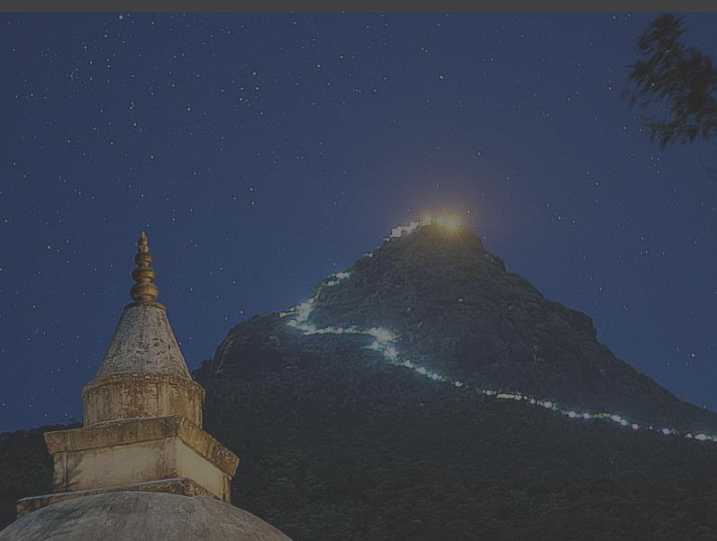


Completion



Future Works

- Combine with community-based preferences.
- Integrate with route planner



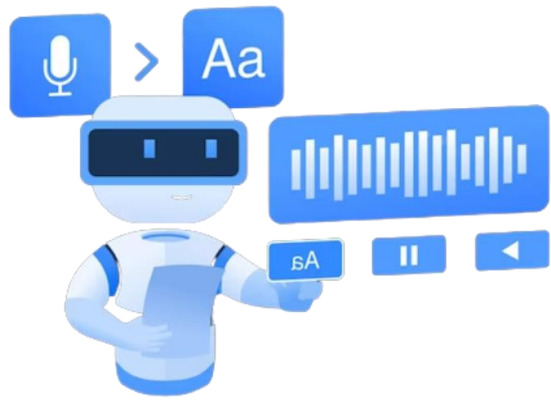


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AI-based chatbot to facilitate the smart communication for native speakers

Research Problem

- The Sri Lankan economy heavily depends on tourism, with historical sites being major attractions.
- Language limitations pose difficulties for tourists in interacting with locals and obtaining accurate information about historical sites.
- Lack of information in languages like German and Tamil, commonly used by tourists visiting Sri Lanka.
- Existing information in widely spoken languages like English does not cater to the diverse range of visitors.

Specific and Sub-Objectives

Sub-Objective 1

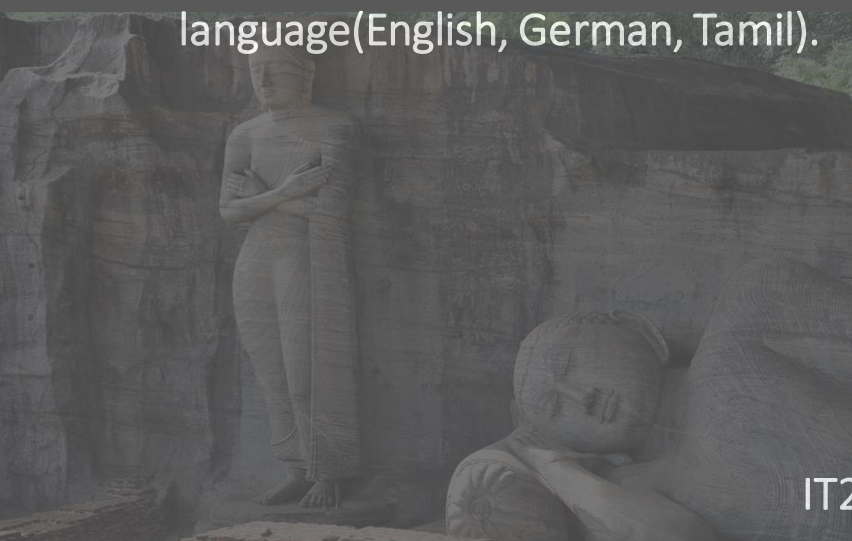
Our proposed AI-based chatbot for tourism allows users to speak or type in their native language, making the communication process more accessible and intuitive for tourists who may not be fluent in the local language(English, German, Tamil).

Sub-Objective 2

This is a mobile application that enables tourists to get information about historical places and landmarks in a way that feels natural and conversational.

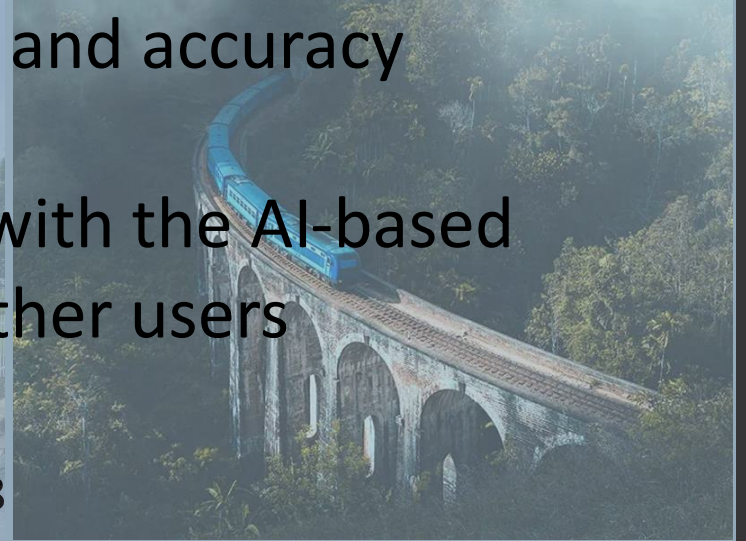
Sub-Objective 3

This chatbot provides both text and voice responses in the user's native language, enhancing the user experience and improving the accessibility of information for all tourists

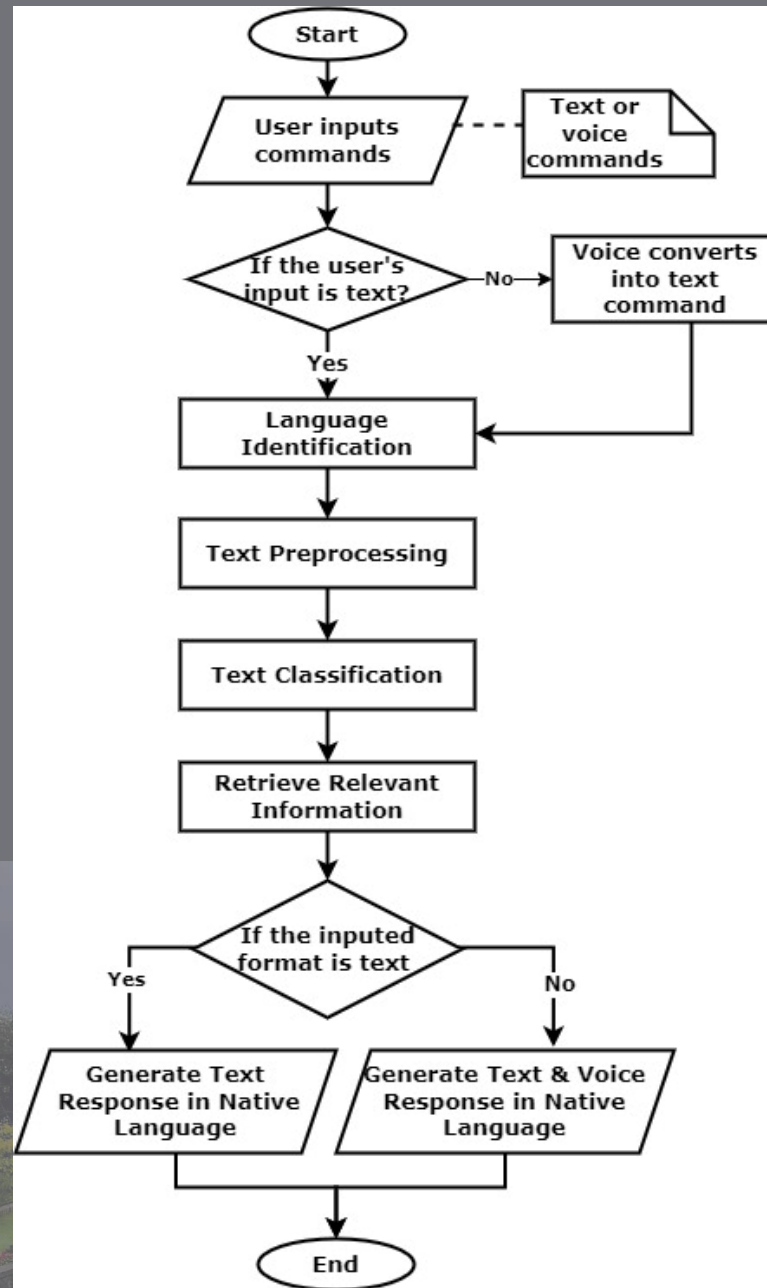


Methodology

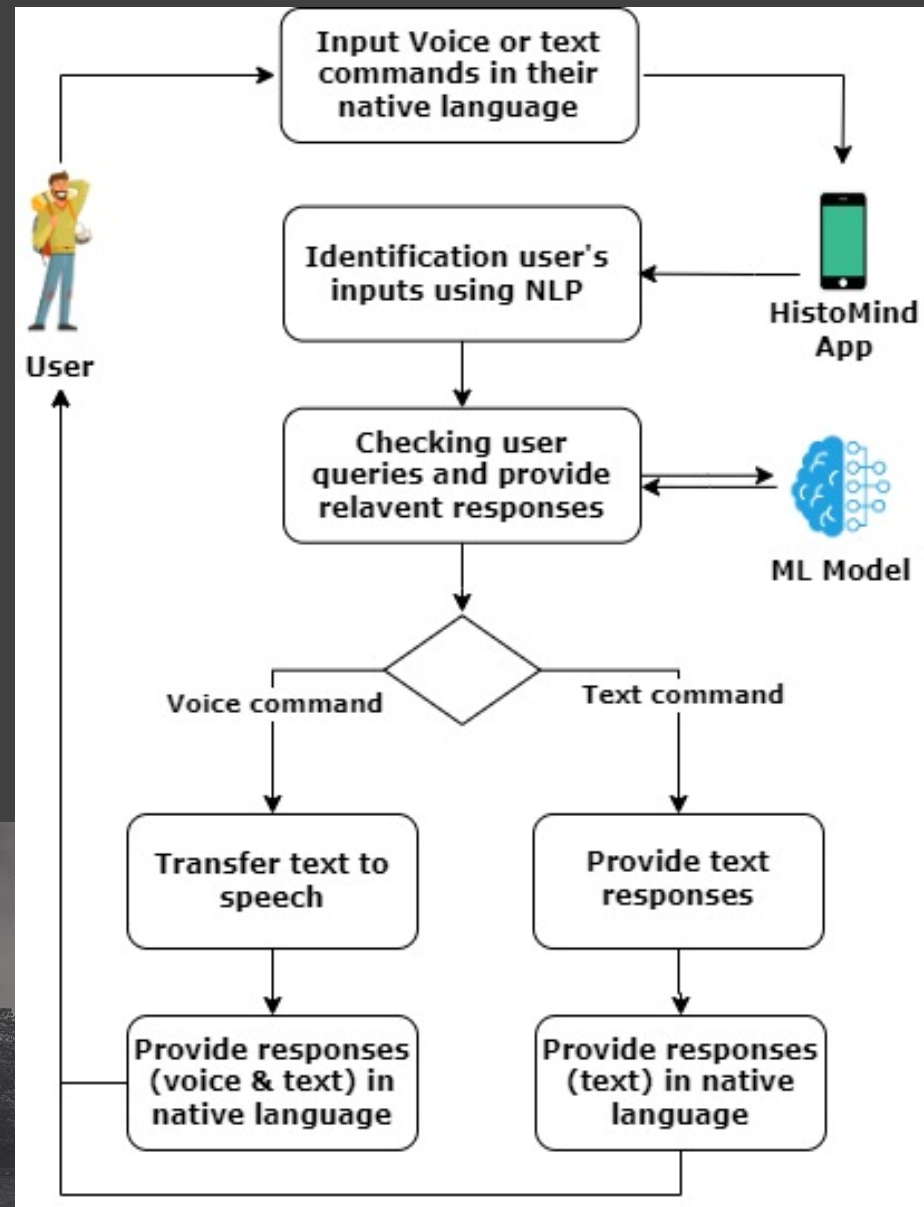
1. **Data Collection:** Collect and prepare a dataset of tourist questions and answers related to historical places
2. **Model Development:** Train and optimize an AI-based chatbot model using NLP and ML techniques on the collected dataset.
3. **Integration:** Integrate the trained model into a mobile application
4. **Testing:** Testing of the chatbot's functionality and accuracy
5. **Deployment:** Deploy the mobile application with the AI-based chatbot to make it available to tourists and other users



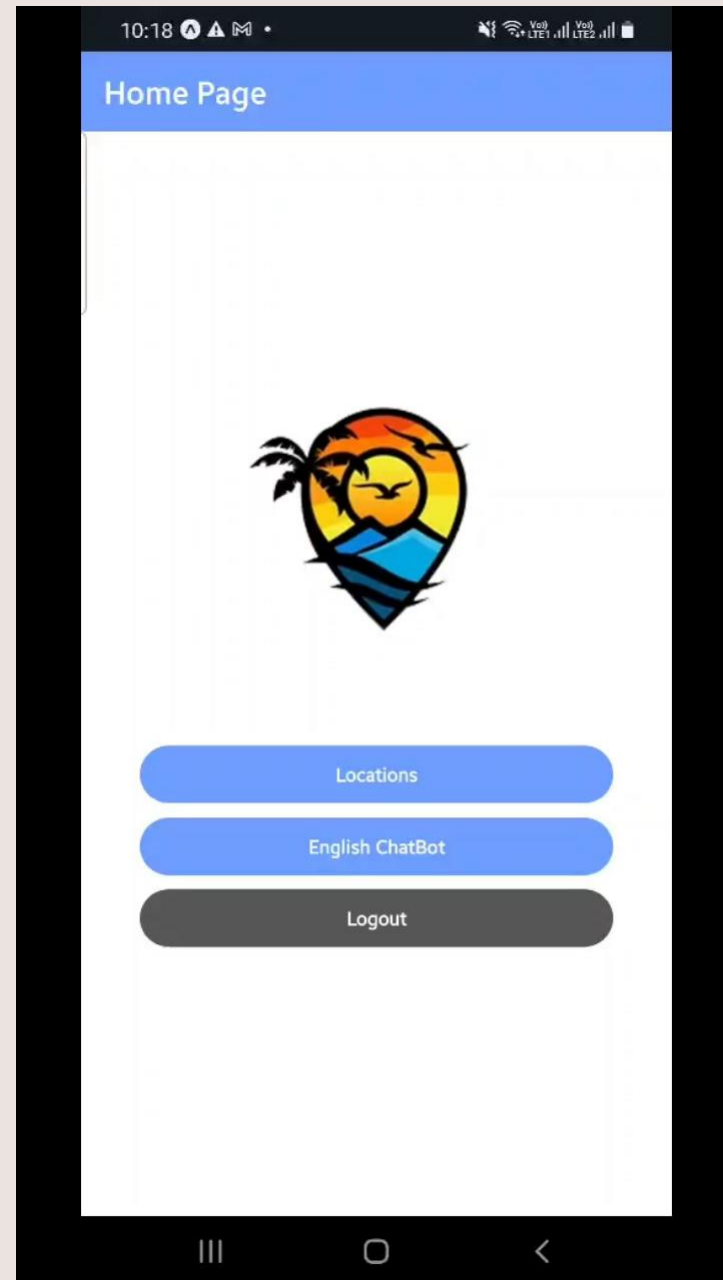
Flow Chart



System overview diagram

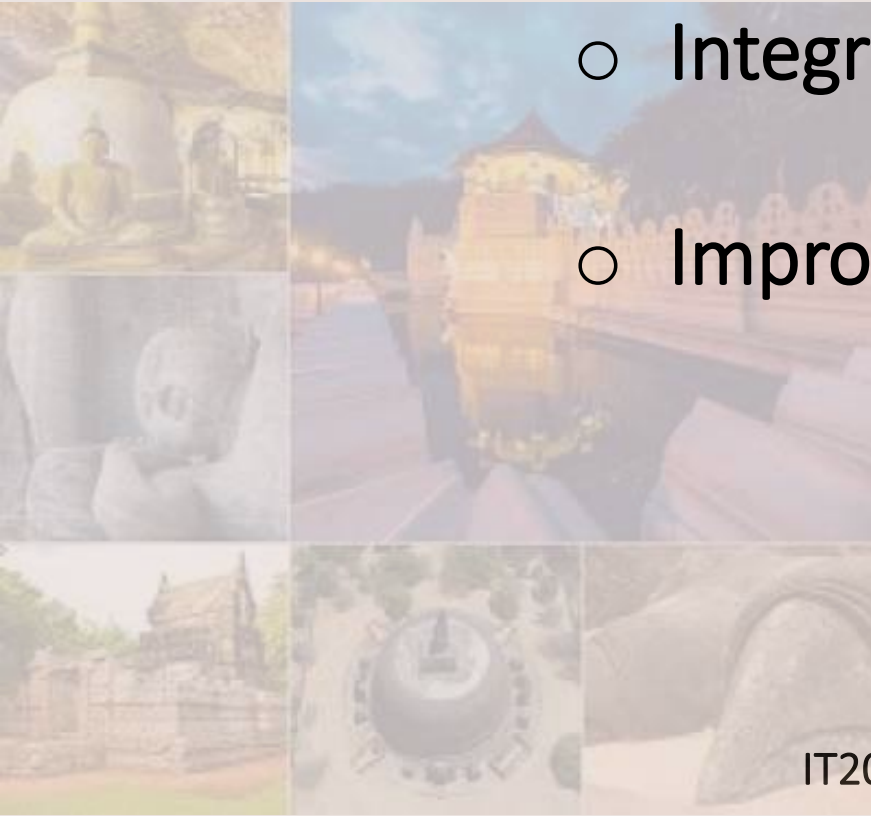


Completion



Future works

- Improve language models accuracy
- Integrate speech recognition feature
- Improve User Interfaces





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3D Modeling Historical Places & Making a Hologram Device

Specific and Sub-Objectives

- The main objective of the part is to make a higher quality hologram of historical places to take the attraction.
- A 3D model is "textured" by adding textures to its surface to give it a realistic appearance
- If we get enough budget, there is a plan to make a mist wall and display the hologram on it. It costs lots of money, so it is a little bit hard to make that.

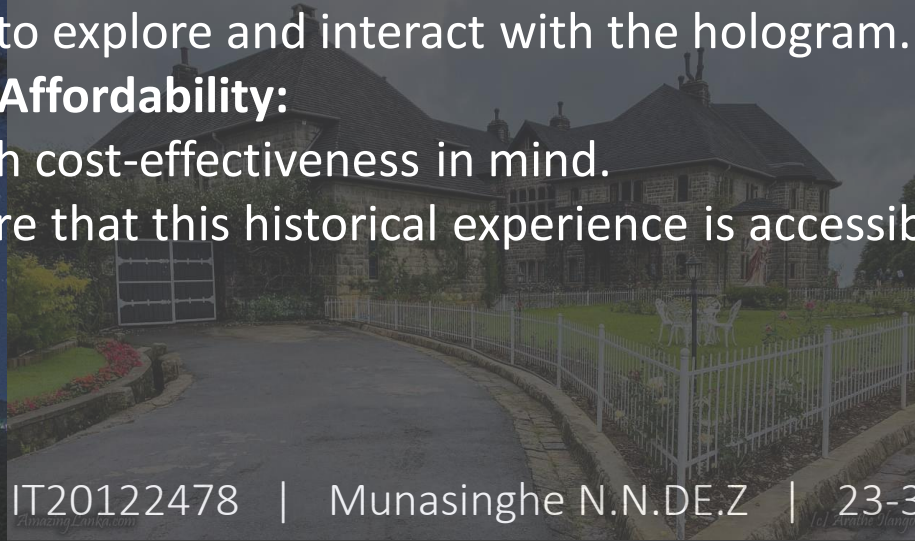


Research Problem

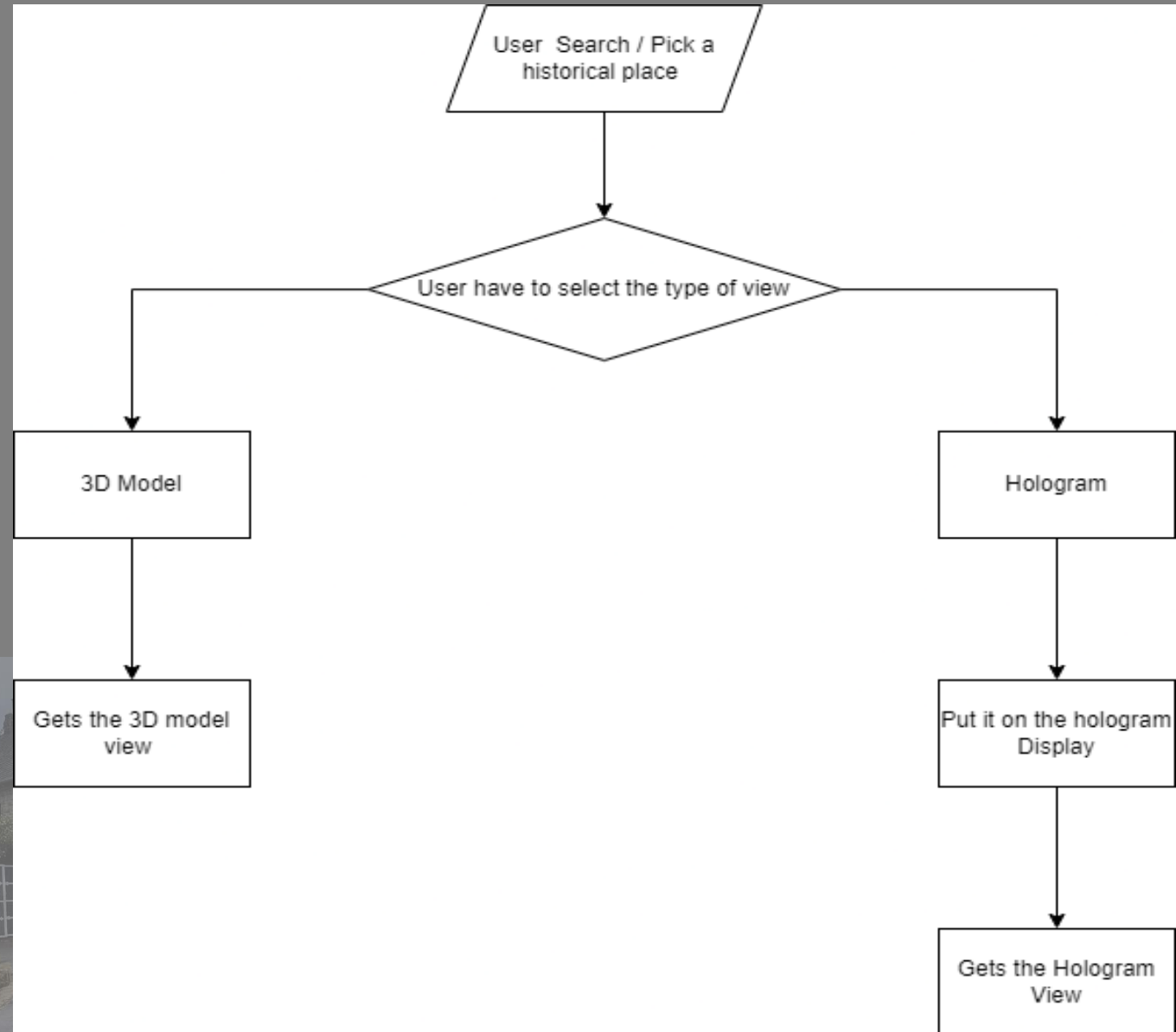
- We can't get a 360 view of any historical place with high quality
- Viewing a Historical Places with a hologram is a new experience
- Can't experience what type of historical place without visiting it

Methodology

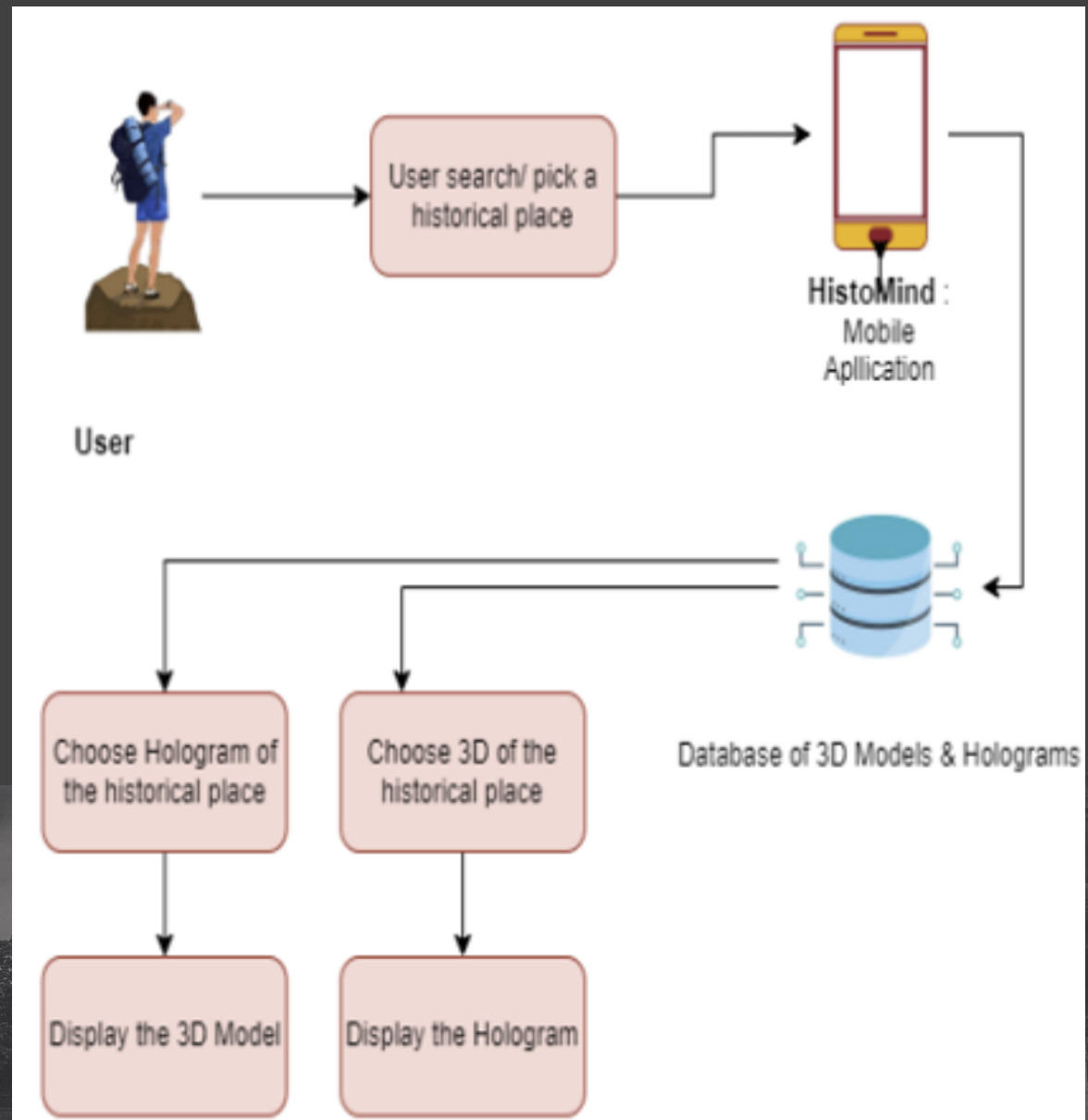
- **Function's Purpose:**
 - Provide a 3D modeling and holographic experience of historical places.
 - Focuses on historical sites in Sri Lanka.
- **Technology Used:**
 - Utilizes Blender, known for its advanced 3D rendering capabilities.
 - Takes advantage of Blender's interactive 3D modeling capabilities.
- **Holographic Display:**
 - Generates a holographic representation of the historical place.
 - Allows users to explore and interact with the hologram.
- **Accessibility and Affordability:**
 - Designed with cost-effectiveness in mind.
 - Aims to ensure that this historical experience is accessible to a wide range of users.



Flow Chart



System overview diagram



Future works

- Design more 3D Models
- Integrate the Device
- Improve quality of the Hologram video





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Historical Places Identification Using Image Processing



Research Problem

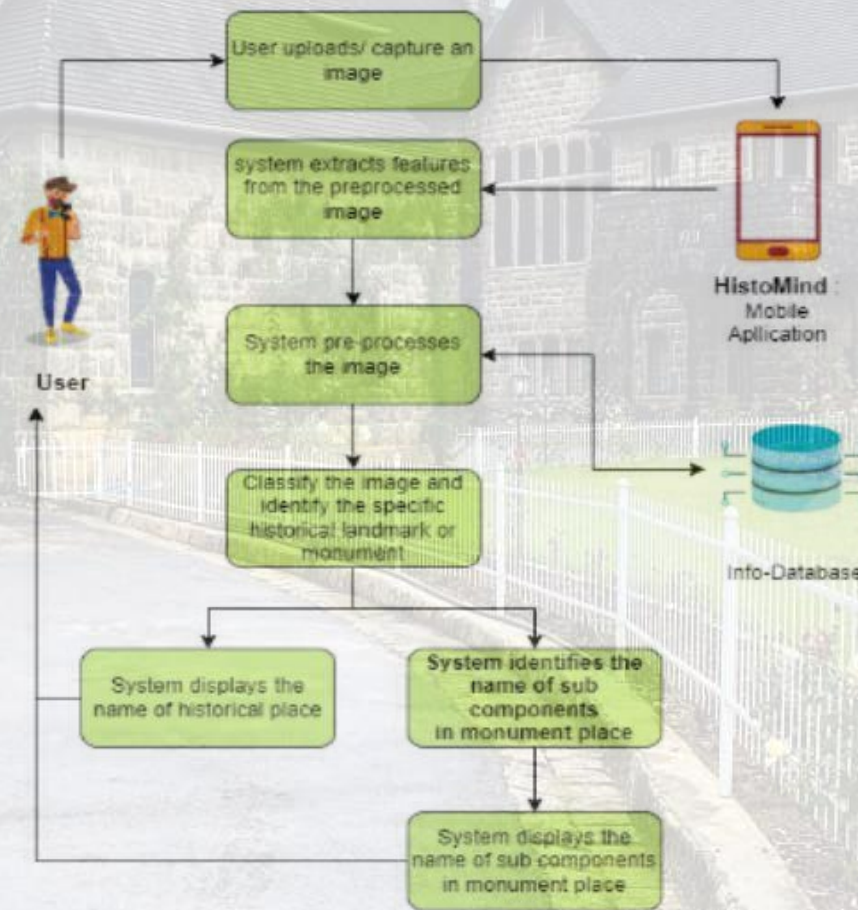
Our research aims to develop a reliable and accurate image recognition system for identifying and categorizing historical landmarks. We will address challenges such as variations in lighting, historical changes, and cultural differences to create a dependable system that works consistently in real-world contexts.

Specific and Sub-Objectives

• Specific

- ❖ To identify which image processing methods are most useful for locating historic places.
- ❖ To evaluate the performance of different machine learning algorithms for identifying historical places.
- ❖ The design of a historical location identification algorithm based on architectural historical places.

System Overview Diagram



Methodology

- **Data Collection** - Gather an array of dataset of images of places in history. You can create your dataset by visiting historical sites and taking images, or you can use web-based historical archives, or all.
- **Preprocessing** - All images should be resized to the same size.
- **Collecting Details** - Pass historical place images through the model to obtain feature vectors.

Future Works

- ❖ Create mobile app version. Improve Model accuracy.
- ❖ Integrate the Component.