

**Project ID :**

TMP-23-378

1. Topic (12 words max)

HistoMind: AI-Powered Historical Place navigator

2. Research group the project belongs to

**Machine Learning and Soft Computing (MLSC)**

3. Research area the project belongs to

**Machine Learning (ML)**

4. If a continuation of a previous project:

Project ID	
Year	

5. Team member details

Student Name	Student ID	Specialization
Leader: Navoda R.C	IT20209520	SE
Member 2: Ranasinghe P.R.K. U	IT20259266	SE
Member 3: Munasinghe N.N.D.E. Z	IT20122478	IT
Member 4: Priyaratne K.K.M.M	IT20008178	IT

6. Brief description of the research problem including references (200 – 500 words max) – references not included in word count

Sri Lanka is a country rich in historical places with a proud history of 2500 years. This archaeological value directly affects the country's economy. According to the SLTDA (Sri Lanka Tourism Development Authority) approximately 2.3 million tourists have visited Sri Lanka in 2019 and by 2021 the number has rapidly dropped by 76% due to the impact of the Covid threat [1]. Steps should be taken urgently to boost this industry which has a major impact on the economy [2].

By 2023, the number of tourists visiting the country is gradually increasing and it can be considered as a good trend to attract them further [3].

Most of the tourists coming to this country tend to visit historical places. Although various projects are implemented from time to time to increase the number of tourists visiting the country, there are very few software solutions provided by the technology sector. Although there are many sources of information in historical places, new techniques are used little to promote them to the society. Also, there is currently no approach in Sri Lanka that facilitates tourists to cover more historical places at a minimum cost in one travel season.

Therefore, it is advantageous to base the historical places that show the cultural characteristics unique to this country, which attract the most tourists.

#### References

- [1] S. L. T. D. Authority, "Tourism Research and Statistics," [Online]. Available: <https://sltda.gov.lk/en/statistics>.
- [2] macrotrends, "Sri Lanka Tourism Statistics 1995-2023," [Online]. Available: <https://www.macrotrends.net/countries/LKA/sri-lanka/tourism-statistics>.
- [3] T. Economics, "Sri Lanka Tourist Arrivals," [Online]. Available: <https://tradingeconomics.com/sri-lanka/tourist-arrivals>.

**7. Brief description of the nature of the solution including a conceptual diagram (250 words max)**

Within our system we propose a new approach to enhance the tourist attraction to Sri Lanka. Currently, the number of tourists coming to Sri Lanka is fluctuating, so we are introducing a method to attract more tourists to historical places.

The new methodology introduced by our system presents trends under 4 sections.

1. Location based recommendation system to easily reach nearby historical places.
2. Chatbot to facilitate the smart communication for native speakers using machine learning.
3. 3D model generating mechanism to visualize historical places.
4. Historical places identification mechanism using image processing.

With this, we will provide information through a more realistic virtual environment using 3D modeling to gain international attention to historical places in Sri Lanka. We will provide a new trend of identifying historical places using image processing. The convenience of communicating in native languages is also available through Chatbot. By showing the shortest way to easily reach the nearby historical places according to the current location, we further highlight our user friendliness.

**8. Brief description of specialized domain expertise, knowledge, and data requirements (300 words max)**

The development of the system requires expertise in the fields of computer vision, machine learning, natural language processing, and tourism. Understanding the history and culture of Sri Lanka and its tourist attractions is also important to ensure that the system accurately represents and highlights these key aspects.

The development team should have a strong understanding of programming languages such as Python, as well as experience with image processing libraries (such as OpenCV), machine learning frameworks (such as TensorFlow or PyTorch), and 3D modeling tools (such as Blender). Knowledge of chatbot development, geolocation data, and APIs for maps and navigation would also be useful.

Accurate data about the historical places and tourist attractions in Sri Lanka is essential for the system to be effective. This may include data on the location, history, culture, and significance of each place, as well as information about accessibility, parking, and other relevant details. The system also needs data on the current location of the user, which can be obtained using GPS or other location-based technologies. In addition, the chatbot requires a large corpus of text data to train its machine learning algorithms, which can be obtained through web scraping, data partnerships, or other sources.

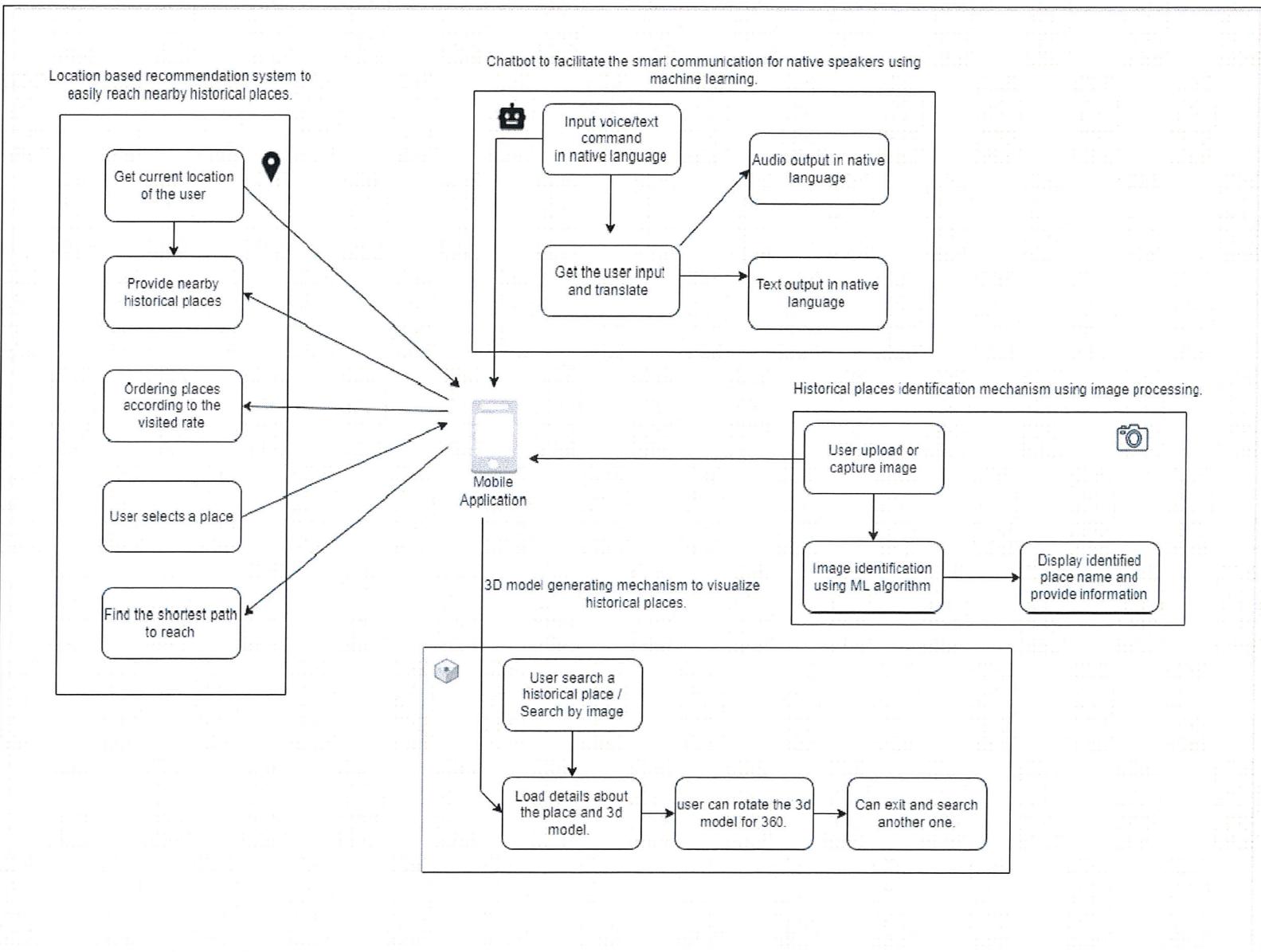
**9. Objectives and Novelty**

**Main Objective**

The main objective of this research is to enhance the tourist attraction to Sri Lanka by introducing a new approach to attract more tourists to historical places in the country. This is achieved by combining several key components, including a location-based recommendation system, a chatbot, 3D modeling, and image processing. These components work together to provide a comprehensive and immersive experience for tourists visiting Sri Lanka, offering information about the country's rich history and culture in an engaging and user-friendly way. The goal is to make it easier for tourists to discover and explore the country's historical places, and to increase the number of tourists visiting Sri Lanka, thus promoting the country's tourism industry and boosting its economy.

The system overview diagram

[https://drive.google.com/file/d/1P0QbTEYOVAxWg4M1R0mGHWrR\\_5EUh7Z7/view?usp=share\\_link](https://drive.google.com/file/d/1P0QbTEYOVAxWg4M1R0mGHWrR_5EUh7Z7/view?usp=share_link)



Member Name	Sub Objective	Tasks	Novelty
Navoda R.C	Location based recommendation system to easily reach nearby historical places using machine learning.	<p>1. Initial task is to gather data about the historical places in Sri Lanka, including their location, history, culture, and significance. This data can be obtained through various sources, such as government databases, tourist boards, or historical societies.</p> <p>2. The next step is to process the geolocation data of the historical places and the user's current location. This may involve using GPS, mapping APIs, or other location-based technologies to determine the proximity of the user to each historical place.</p> <p>3. Once the data has been collected and processed, the machine learning model can be trained using this data. The model should be trained to recommend historical places</p>	<p>So far, a location-based recommendation system has been introduced for travel planners-based applications and they are presented under classifications as most visited, and top rated. In this way, we are also inspired by the existing approaches (hybrid recommendation) for location-based recommendation and as a novelty to get the data of nearby historical places based on the current location, it can be adjusted the weight of each method control the balance between novelty and popularity. Furthermore, existing research so far only provide recommendations.</p> <p>In the travel planning-based research that has been done so far, location-based recommendations have been</p>

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		<p>based on the user's current location, taking into account factors such as proximity, travel time, and the user's interests and preferences.</p> <p>4. After the model has been trained, it can be used to generate recommendations for the user, based on their current location and other relevant factors. The recommendations should be presented in an easy-to-use and accessible format, such as a map or list, to help the user find their way to the nearest historical place.</p> <p>5. The final step is to gather feedback from users about the recommendations generated by the system. This feedback can be used to improve the accuracy of the model and make recommendations even more tailored to the user's needs.</p>	<p>improved, but an approach that can easily reach those locations is not provided. Therefore, as a new feature, we facilitate user to get the shortest path that can be easily reached to the recommended places. The purpose of this is to give the tourist the opportunity to easily visit more places in less time at less cost.</p>
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Ranasinghe P.R.K. U	Chatbot to facilitate the smart communication for native speakers using machine learning.	<ol style="list-style-type: none"> <li>1. The chatbot must be able to understand and process human language, which can be achieved through the use of Natural language processing (NLP)algorithms.</li> <li>2. The chatbot must be able to identify the intention behind a user's message, such as a request for information or a question about a specific historical place.</li> <li>3. The chatbot must be able to manage the conversation flow, determine the appropriate response, and provide relevant information to the user.</li> <li>4. The chatbot should be developed to analyze the sentiment expressed in the user's message, such as whether they are happy, sad, frustrated, or neutral, and adjust its responses accordingly.</li> </ol>	The user can enter text commands and receive text output in either English or the user's native language. Furthermore, the user can enter voice commands in a specific language and then retrieve output in English. But a newly created one uses five native languages to input text commands or voice commands, and the user can retrieve and output their own language. And also, if the user inputs voice commands, he can retrieve output in both types (text and voice responses).
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		<p>5. The chatbot must be able to personalize its responses based on user information, such as their location, interests, and preferences.</p> <p>6. The chatbot is used machine learning algorithms to continuously improve its understanding of human language and its ability to provide accurate and relevant responses.</p>	
Munasinghe N.N.D.E. Z	3D model generating mechanism to visualize historical places.	<p>1. The mechanism must be able to create realistic and accurate 3D models of historical places, taking into account factors such as architecture, landscape, and cultural significance.</p> <p>2. The mechanism must gather and organize data on the historical places, such as images, maps, and historical information.</p>	<p>By trying new software and build better 3d module. And also, can get a help to view a 3d module with 3d glass. Within our system we try to get a better integration. And also get some idea about VR reality and trying to make a real one.</p>

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		<p>3. The mechanism must use image processing algorithms to extract relevant information from the data and generate high-quality 3D models.</p> <p>4. The mechanism must be able to display the 3D models in a way that is easy to understand and visually appealing, using technologies such as virtual reality (VR) and augmented reality (AR).</p> <p>5. The mechanism must provide interactive features, such as the ability to zoom in and out, rotate the model, and explore different parts of the historical place.</p> <p>6. The mechanism must use machine learning algorithms to continually improve the quality of the 3D models and make them more accurate and detailed over time.</p>	
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Priyaratne K.K.M.M	Historical places identification mechanism using image processing.	<ol style="list-style-type: none"> <li>1. The mechanism must gather images of historical places from various sources, such as databases, archives, and tourists.</li> <li>2. Image processing algorithms are used to extract features from the images, such as patterns, textures, and shapes, and use this information to identify the historical places.</li> <li>3. It should be developed to extract features that are unique to each historical place, such as its architecture, sculptures, and cultural significance.</li> <li>4. Machine learning algorithms are used to classify the images based on their features and identify which</li> </ol>	Using the necessary algorithms to increase the accuracy over the results obtained from the research that has been done so far.

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		<p>historical place each image represents.</p> <p>5. The mechanism must be integrated with a database that contains information on the historical places, such as their names, locations, and historical significance.</p> <p>6. It must have a user-friendly interface that allows users to easily upload images and receive information on the historical places identified in the images.</p>	
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**10. Supervisor checklist (supervisors should fill sections 10 and 11)**

a) Is this research problem valid?

Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>
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b) Is the proposed research group correct?

Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>
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c) Is the proposed research area correct?

Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>
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d) Do the proposed sub-objectives match the students' specialization?

Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>
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e) Is the required domain expertise, knowledge, and the data available either through the supervisor or external supervisor?

Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>
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f) Is the scope of the solution practical?

Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>
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g) Do all sub-objectives have sufficient novelty?

Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>
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**11. Supervisor details**

	Title	First Name	Last Name	Signature
Supervisor	Mr	Harshamal	SMS	
Co-Supervisor	Dr.	Samal	Rajendra	
External Supervisor				
Summary of external supervisor's (if any) experience and expertise				

## Summary Sheet

*The topic evaluation panel will use the summary sheet to evaluate the suitability of the project*

### 1. Brief description of research problem including references (200 – 300 words max)

Sri Lanka is a country rich in historical places with a proud history of 2500 years. This archaeological value directly affects the country's economy. According to the SLTDA (Sri Lanka Tourism Development Authority) approximately 2.3 million tourists have visited Sri Lanka in 2019 and by 2021 the number has rapidly dropped by 76% due to the impact of the Covid threat [1]. Steps should be taken urgently to boost this industry which has a major impact on the economy [2].

By 2023, the number of tourists visiting the country is gradually increasing and it can be considered as a good trend to attract them further [3].

Most of the tourists coming to this country tend to visit historical places.

Although various projects are implemented from time to time to increase the number of tourists visiting the country, there are very few software solutions provided by the technology sector. Although there are many sources of information in historical places, new techniques are used little to promote them to the society. Also, there is currently no approach in Sri Lanka that facilitates tourists to cover more historical places at a minimum cost in one travel season.

Therefore, it is advantageous to base the historical places that show the cultural characteristics unique to this country, which attract the most tourists.

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2. Brief description of the nature of the solution (150 words max)

Within our system we propose a new approach to enhance the tourist attraction to Sri Lanka. Currently, the number of tourists coming to Sri Lanka is fluctuating, so we are introducing a method to attract more tourists to historical places.

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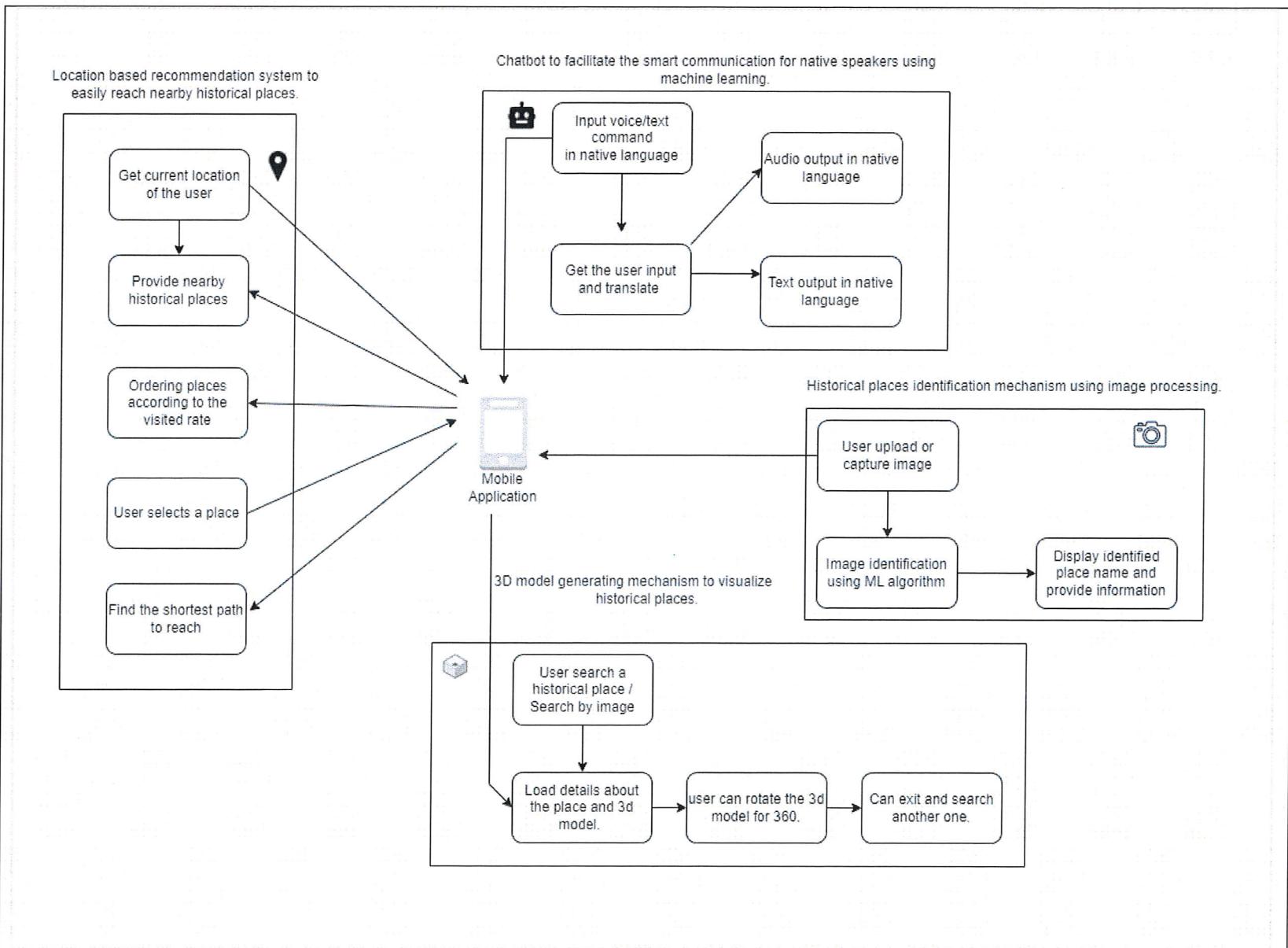
3. Objectives and novelty

Main Objective

The main objective of this research is to enhance the tourist attraction to Sri Lanka by introducing a new approach to attract more tourists to historical places in the country. This is achieved by combining several key components, including a location-based recommendation system, a chatbot, 3D modeling, and image processing. These components work together to provide a comprehensive and immersive experience for tourists visiting Sri Lanka, offering information about the country's rich history and culture in an engaging and user-friendly way. The goal is to make it easier for tourists to discover and explore the country's historical places, and to increase the number of tourists visiting Sri Lanka, thus promoting the country's tourism industry and boosting its economy.

The system overview diagram.

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		<p>factors such as proximity, travel time, and the user's interests and preferences.</p> <p>4. After the model has been trained, it can be used to generate recommendations for the user, based on their current location and other relevant factors. The recommendations should be presented in an easy-to-use and accessible format, such as a map or list, to help the user find their way to the nearest historical place.</p> <p>5. The final step is to gather feedback from users about the recommendations generated by the system. This feedback can be used to improve the accuracy of the model and make recommendations even more tailored to the user's needs.</p>	<p>new feature, we facilitate user to get the shortest path that can be easily reached to the recommended places. The purpose of this is to give the tourist the opportunity to easily visit more places in less time at less cost.</p>
Ranasinghe P.R.K. U	Chatbot to facilitate the smart communication for native speakers using machine learning.	<p>1. The chatbot must be able to understand and process human language, which can be achieved through the use of Natural language processing (NLP)algorithms.</p>	<p>The user can enter text commands and receive text output in either English or the user's native language. Furthermore, the user can enter voice commands in a specific</p>

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		<p>2. The chatbot must be able to identify the intention behind a user's message, such as a request for information or a question about a specific historical place.</p> <p>3. The chatbot must be able to manage the conversation flow, determine the appropriate response, and provide relevant information to the user.</p> <p>4. The chatbot should be developed to analyze the sentiment expressed in the user's message, such as whether they are happy, sad, frustrated, or neutral, and adjust its responses accordingly.</p> <p>5. The chatbot must be able to personalize its responses based on user information, such as their location, interests, and preferences.</p> <p>6. The chatbot is used machine learning algorithms to continuously improve its</p>	<p>language and then retrieve output in English. But a newly created one uses five native languages to input text commands or voice commands, and the user can retrieve and output their own language. And also, if the user inputs voice commands, he can retrieve output in both types (text and voice responses).</p>
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		understanding of human language and its ability to provide accurate and relevant responses.	
Munasinghe N.N.D.E. Z	3D model generating mechanism to visualize historical places.	<p>1. The mechanism must be able to create realistic and accurate 3D models of historical places, taking into account factors such as architecture, landscape, and cultural significance.</p> <p>2. The mechanism must gather and organize data on the historical places, such as images, maps, and historical information.</p> <p>3. The mechanism must use image processing algorithms to extract relevant information from the data and generate high-quality 3D models.</p> <p>4. The mechanism must be able to display the 3D models in a way that is easy to understand and visually appealing, using technologies such as virtual reality (VR) and augmented reality (AR).</p>	By trying new software and build better 3d module. And also, can get a help to view a 3d module with 3d glass. Within our system we try to get a better integration. And also get some idea about VR reality and trying to make a real one.

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		<p>5. The mechanism must provide interactive features, such as the ability to zoom in and out, rotate the model, and explore different parts of the historical place.</p> <p>6. The mechanism must use machine learning algorithms to continually improve the quality of the 3D models and make them more accurate and detailed over time.</p>	
Priyaratne K.K.M.M	Historical places identification mechanism using image processing.	<p>1. The mechanism must gather images of historical places from various sources, such as databases, archives, and tourists.</p> <p>2. Image processing algorithms are used to extract features from the images, such as patterns, textures, and shapes, and use this information to identify the historical places.</p> <p>3. It should be developed to extract features that are unique</p>	Using the necessary algorithms to increase the accuracy over the results obtained from the research that has been done so far.

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		<p>to each historical place, such as its architecture, sculptures, and cultural significance.</p> <p>4. Machine learning algorithms are used to classify the images based on their features and identify which historical place each image represents.</p> <p>5. The mechanism must be integrated with a database that contains information on the historical places, such as their names, locations, and historical significance.</p> <p>6. It must have a user-friendly interface that allows users to easily upload images and receive information on the historical places identified in the images.</p>	
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**Topic Assessment Form**

**This part to be filled by the Topic Screening Panel members**

Acceptable: Mark>Select as necessary

<input type="checkbox"/> Topic Assessment Accepted	
<input type="checkbox"/> Topic Assessment Accepted with minor changes (should be followed up by the supervisor)*	
<input type="checkbox"/> Topic Assessment to be Resubmitted with major changes*	
<input type="checkbox"/> Topic Assessment Rejected. Topic must be changed	

\* Detailed comments given below

Comments

The Review Panel Details

Member's Name	Signature

**Important:**

1. According to the comments given by the panel, do the necessary modifications and get the approval by the **Supervisor** or the **Same Panel**.
2. If the project topic is rejected, identify a new topic, and request the RP Team for a new topic assessment.
3. The form approved by the panel must be attached to the **Project Charter Form**.