Project Synopsis

Master of Computer Applications

(Stream – Year)

Under the Guidance of

Name of Guide

Project Title

Subtitle (If Any)

Group Number:

Member1 (Enrolment No.)

Member2 (Enrolment No.)

Member3 (Enrolment No.)

Member4 (Enrolment No.)

Member5 (Enrolment No.)

University of Engineering and Management, Kolkata

Institute of Engineering and Management, Newtown Campus

Department of Computer Applications****

**Project Synopsis Template for Final Year Project**

**Title of the Project: NeuraVision**

**1. Introduction:**

* NeuraVision aims to develop a system that assists visually impaired individuals by detecting objects, calculating distances, and providing auditory instructions based on real-time environmental data.
* The motivation behind this project stems from the desire to enhance the independence and safety of visually impaired individuals using advanced technology.
* In today's context, with increasing advancements in computer vision and AI, such solutions hold significant promise for improving accessibility and quality of life.

**2. Objectives:**

* Develop a real-time object detection system capable of identifying common obstacles.
* Calculate distances accurately to provide spatial awareness.
* Convert visual data into voice-based instructions for users.

**3. Problem Statement:**

* Visually impaired individuals face challenges in navigating environments independently due to obstacles that are not always detectable through traditional aids.
* Current assistive technologies often lack the ability to accurately detect and relay information about real-time obstacles and distances, limiting user mobility and safety.

**4. Scope of the Project:**

Inclusions: Object detection, distance calculation, voice output system.

Exclusions: Facial recognition, complex environmental conditions (e.g., extreme weather), and high-speed movement scenarios.

**5. Literature Review:**

Existing research focuses on computer vision for object detection and spatial awareness, but few systems integrate real-time auditory feedback tailored for visually impaired users.

This project aims to bridge existing gaps by combining accurate object detection with distance estimation and intuitive auditory feedback.

**6. Methodology:**

Utilize deep learning models for object detection and distance estimation.

Implement algorithms for real-time data processing and integration with a speech synthesis module.

Develop a user-friendly interface for system interaction.

**7. System Design:**

Architecture will include a camera/sensor module for data acquisition, a processing unit for real-time analysis, and a voice synthesis module for auditory output.

Design diagrams will include data flow models and a high-level system architecture overview.

**8. Implementation Plan:**

Phase 1: Research and selection of appropriate deep learning models and sensors (2 weeks).

Phase 2: System design and algorithm development (4 weeks).

Phase 3: Prototype development and integration (6 weeks).

Phase 4: Testing, validation, and user feedback collection (2 weeks).

**9. Expected Outcomes:**

A functional prototype of NeuraVision capable of real-time object detection and distance calculation.

Improved mobility and safety for visually impaired users through accurate auditory guidance.

**10. Testing and Validation:**

Conduct rigorous testing including scenario-based simulations and real-world trials with visually impaired users.

Validate accuracy of object detection and distance estimation against predefined benchmarks.

**11. Risk Management:**

Risks include hardware compatibility issues and algorithmic accuracy under diverse environmental conditions.

Mitigation strategies involve iterative testing and user feedback loops during development phases.

**12. Project Management:**

Project Lead: [Your Name]

Team Members: [List of Team Members and Roles]

Timeline: Detailed Gantt chart outlining milestones and resource allocation.

**13. Conclusion:**

NeuraVision aims to significantly improve the independence and safety of visually impaired individuals by providing them with real-time auditory guidance based on advanced object detection and distance estimation technologies.

Future iterations could explore additional functionalities and enhancements based on user feedback and technological advancements.

**14. References:**

* List of references and sources consulted during the project.

**Appendices: (OPTIONAL)**

Appendix A: Detailed system architecture diagrams.

Appendix B: Code snippets and configurations.