

**Title of the Project:** *SenseAI*: Immersive Audio Descriptions for the Visually Impaired

**Problem Statement:**

The visually impaired community often faces challenges in perceiving the richness, detail, and emotional essence of the world around them. Existing assistive technologies like screen readers or object recognition tools provide basic, utilitarian descriptions that lack depth and immersion. These descriptions focus mainly on function and identification but do not capture the nuances, beauty, and emotional resonance of the visual experience. As a result, visually impaired individuals are often deprived of the full experience of the world—the ability to feel the grandeur of a sunset, the intricate patterns of artwork, or the emotive expressions of human faces in an evocative way. This gap limits their interaction with and emotional connection to their environment, which is critical for a fulfilling and comprehensive sensory experience of life.

**Target Users:**

*SenseAI* is designed to assist the visually impaired community, specifically targeting individuals who use existing handheld devices and assistive technologies such as smartphones, smart glasses, or other wearable devices that already provide some level of support through audio descriptions. These users are seeking more than just informational detail—they are looking for an emotional and sensory enrichment of their everyday experiences.

**Proposed AI Solution:**

*SenseAI* leverages Generative AI to transform the way visually impaired people experience the world through sound. By integrating state-of-the-art language models with computer vision technologies, *SenseAI* delivers rich, highly descriptive, and immersive audio descriptions that are not just informative but emotionally evocative. Instead of simply identifying an object ("A red apple on the table"), *SenseAI* creates a vivid auditory experience: "A shiny, deep red apple sits on the table, its smooth skin glistening in the sunlight, evoking a sense of freshness and inviting you to take a crisp bite."

These descriptions are designed to bridge the sensory gap, creating an experience that simulates the emotional and aesthetic impact of visual observation. Using context-sensitive information, *SenseAI* can adapt descriptions based on the environment and the user's specific needs, delivering real-time audio feedback that feels more like a guided sensory experience rather than a clinical enumeration of facts.

*SenseAI* is designed to be seamlessly integrated into the assistive technology ecosystem that users already rely on, augmenting existing functionalities and offering them an enhanced layer of immersive interaction.

**Human-Centered Design Elements:**

1. **Contextual Awareness:** The system should adopt a socio-technical perspective, recognizing that audio descriptions are not just technical outputs but are embedded in social systems involving human users and contexts. It takes into account the context, user preferences, and cultural sensitivities to ensure meaningful engagement.
2. **User-Centric Personalization:** The system should be designed to allow users to customize the level of detail and the descriptive style, ensuring adaptability to personal preferences and reducing the cognitive load through familiar, relevant narratives.
3. **Fair and Ethical Representation:** The system should be developed with fairness as a core principle, avoiding abstraction pitfalls that exclude social context. Descriptions of people, for instance, are handled with particular care to avoid stereotypes or offensive language, ensuring inclusive and unbiased representation that aligns with diverse cultural and societal norms.
4. **Feedback Integration:** The design process should include continuous input from visually impaired users and relevant stakeholders (e.g., advocacy groups and accessibility experts) to align with ethical guidelines and ensure the solution meets real-world needs, rather than imposing abstract, one-size-fits-all technical solutions.
5. **Transparency and Contestability:** The system should support transparency in its descriptive generation processes, allowing users to understand and contest descriptions if they feel misrepresented. This openness to user feedback ensures that ethical considerations are met while keeping the technology aligned with social and moral expectations.
6. **Social and Emotional Enrichment:** Leveraging generative AI, *SenseAI* should offer immersive descriptions that not only convey information but also the emotional and aesthetic qualities of the world. This feature ensures that the experience of visually impaired users is enriched to evoke a fuller, more satisfying sensory interaction.

**Potential Stakeholders for Feedback:**

1. **Visually Impaired Users and Advocacy Groups:** Engaging directly with visually impaired individuals and groups such as the American Council of the Blind or the Royal National Institute of Blind People (RNIB) will provide critical insights into user needs, challenges, and real-world usability of the technology.
2. **Accessibility Technology Developers:** Collaborating with companies and developers working on existing assistive tools like screen readers, OCR (optical character recognition) software, and wearable device manufacturers will ensure that *SenseAI* integrates effectively with existing technologies and does not require major workflow disruptions for users.
3. **Healthcare Professionals and Occupational Therapists:** Consulting with healthcare professionals will provide insights into how *SenseAI* can improve the mental well-being and sensory experience of users, as well as ensure its practical benefits in daily life.
4. **Academic Researchers in AI and HCI (Human-Computer Interaction):** Partnering with researchers specializing in HCI can provide feedback on how the design of *SenseAI* aligns with best practices for enhancing accessibility and inclusivity in technology.

By adopting an empathetic, human-centered approach, *SenseAI* aims to fundamentally redefine the interaction between visually impaired users and their environment, transforming the concept of assistive technology from simple utility to an immersive, enriching experience that truly makes the unseen world more tangible and emotionally impactful while ensuring that the technology is inclusive, unbiased, and respectful to all individuals.