AI-VASTRA: A MULTIMODAL AI ASSISTANT FOR E-COMMERCE TRUST AND FIT

Prathamesh Baviskar — B.Tech Student, IIT Kanpur
Dheeraj Dagar — B.Tech Student, IIT Kanpur
Ayushmaan Singh — B.Tech Student, IIT Kanpur
Rishith Jalagam— B.Tech Student, IIT Kanpur
Rajesh Inapakurti — B.Tech Student, IIT Kanpur

Abstract

The rapid growth of e-commerce in India has increased the need for systems that support accessibility, trust, and product understanding—especially for multilingual and low-literacy users. AI-Vastra is a multimodal AI prototype that integrates speech, language, and vision technologies to help users interact with online product information more confidently. It enables natural conversation through speech-to-text and text-to-speech, provides verified summaries of product reviews, and visualizes fit or scale through Virtual Try-On (VTO) and Augmented Reality (AR) size visualizers. This paper presents the design, methodology, and potential impact of AI-Vastra as an inclusive AI system for e-commerce trust and usability.

1. Introduction

Many new or low-literacy online shoppers struggle with understanding product details, evaluating authenticity, and estimating real-world size and fit. AI-Vastra addresses these challenges using an AI-driven multimodal interface that simplifies product information and enhances trust through visualization and verified signals.

2. Literature Review

Existing research shows that multimodal interfaces improve accessibility for low-literacy users, while AR tools enhance product understanding and confidence in online shopping. Trust indicators such as verified badges are proven to reduce uncertainty. AI-Vastra integrates these well-established concepts into a single system tailored for inclusive e-commerce.

3. Methodology

AI-Vastra was developed using a user-centered approach with iterative prototyping. The system employs a modular architecture using HTML/CSS/JS on the frontend and APIs such as Azure Cognitive Services and ClipDrop on the backend. User testing sessions with diverse participants evaluated usability, clarity, and trust-building effectiveness.

4. Results

Evaluation showed that users experienced:

- Improved comprehension of product fit using AR-Lite visualization
- Increased trust due to verified product badges

- Clearer understanding of product reviews through simplified Q&A
- Higher engagement with speech-based interactions compared to text input

User feedback emphasized the effectiveness of the system's multimodal approach in reducing confusion and enhancing shopping confidence.

5. Discussion and Implications

The results show that multimodal AI tools significantly improve accessibility and trust in e-commerce. AI-Vastra demonstrates practical value for users who rely on simplified interactions. Future improvements should expand language support and introduce more advanced visualization for increased accuracy.

6. Conclusion and Recommendations

AI-Vastra successfully addresses major barriers in online shopping through its AI-driven multimodal interface. The project shows promise for broader deployment in inclusive digital systems. Future enhancements include expanding regional language coverage, improving 3D visualization capabilities, and conducting larger controlled user studies.