



IMMERSIVE ANALYTICS

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Abstract

Immersive Analytics focuses on the benefits and challenges of using immersive environments for data analysis, and developing designs to improve efficiency. Although immersive technologies are widely available, practical solutions have not gained widespread acceptance in real-world applications.

Research in this field focuses on abstract 3D visualization, immersive environments, paper sampling and use case evaluation.

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Introduction

- To facilitate data-driven analytical reasoning, immersive analytics leverages interactive technology like as virtual reality glasses, big flat screen displays, and even the internet of things.
- Immersion refers to an experience that creates a genuine sense of presence in a virtual environment.
- A person experiences a shift in awareness from their immediate real environment to another reality.
- Immersion analytics is still a relatively new field that has mostly been studied in use cases and workshops.
- The notion remains extremely difficult, even within the small community of immersive analytics practitioners.

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Related Works

- Brooks early review of VR applications found it effective in specific domains like flight simulators, automotive engineering, and astronaut training.
- Van Dam et al. highlighted VR applications for SciVis, benefiting archaeology and medical fields.
- Laha and Bowman reviewed VR techniques for visualizing volume data, highlighting the need for controlled experiments to explore individual components of immersion.
- Reda et al. summarized research for hybrid reality environments like the CAVE2, emphasizing the possibility of collaborative data analysis.
- Brath collected evidence that 3D visualizations offer advantages beyond 2D, focusing on immersive displays.

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Methodology

4.1 Immersive environments

- The study focuses on immersive environments leading to a mixed reality experience.
- Abstract 3D visualizations must be presented in a mixed or VR environment where hardware and user interact closely.

4.2 Abstract 3D visualizations

- Data that lacks a physical representation or intrinsic spatial organization is referred to as abstract data.
- In visualization, abstraction is obtained by using colors and shapes that are not directly associated with the object.

4.3 Paper sampling

- Paper sampling in immersive analytics refers to the process of selecting and gathering relevant research papers and publications related to immersive analytics.

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Result

- Overall, immersive analytics can lead to better data comprehension, better decision-making, more engagement and teamwork, effective big data exploration, creative data visualization methods, non-technical users' empowerment, and applications in a variety of fields.
- These results add to the increasing importance of immersive analytics as an efficient tool for decision support and data analysis.

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Conclusion and future scope

- In conclusion, immersive analytics has the potential to completely transform how we work with data by facilitating deeper understanding, better decision-making, and improved teamwork.
- Immersion analytics will develop further and contribute significantly to data analysis and decision support in the future by tackling issues and seizing opportunities in technological innovation, domain-specific applications, ethical issues, and user experience design.