

# Bringing the Desktop Back to the Desk:

## Interactive AR Representations of Digital Files and Structure

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**Collaborators:** None

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### Motivation and Goal:

Traditional file management relies on 2D grids with filenames, icons, and metadata, drawing from the physical filing metaphor of a real-world desktop. Although this system is well-known, it does not tap into spatial and contextual benefits of physical object interaction. Augmented reality (AR) presents an opportunity to redefine static file organization in a more immersive way. The goal of my project is to leverage AR to reduce cognitive load, enhance spatial memory, and improve file efficiency by enabling stronger spatial associations within digital file management.

### Problem Background and Related Work:

This project is a system contribution, providing an interactive AR-based file management prototype in place of the conventional 2D desktop. While prior works like Spatial [1] and Bumptop [2] have explored AR and VR interfaces, few have specifically investigated how AR can enhance efficiency in file management beyond 2D paradigms. This work addresses that gap by exploring user interactions with digital-native file structures in augmented 3D space. By evaluating usability and interaction efficiency, this project will help inform future developments in AR workspace design.

### Approach:

This project's approach introduces a more interactive and context-aware workspace, where files behave as objects rather than abstract icons. Users can pinch, move, and group files by collecting them in their palm, clenching their fist to form folders, and previewing files spatially. Additionally, folders can be opened within the space, enabling navigation in directories. By combining digital organization with real-world spatial familiarity, there is opportunity to make file management approachable for users who struggle with traditional structures. This project involves designing an AR prototype that integrates these interactions, with a final user experience study to evaluate usability and efficiency gains compared to traditional file management.

### Plan:

The project will require Apple Vision Pro Xcode development through several phases: developing an AR prototype with simple file interactions, building upon that version to add gesture recognition and spatial organization (e.g., pinch to move, clench to create folders), and

the development of a demo mode that enables standardized user interviews. Risks to this plan include potential tracking inaccuracies and negative early user feedback, which will be addressed through efficient iterative design.

**Evaluation:**

Upon completion of the prototype platform, user research and experience interviews will be conducted within the researcher's network of connections. Participants will experience the platform in demonstration mode that leads them through the process of setting up a desktop. Following the demo, a short interview will be conducted with standardized questions to further gauge the participant's interactions. Success will be determined by user engagement (number of interactions), task completion speed, and overall satisfaction with the new spatial interface.

**Research Questions:**

1. How does AR file management compare to traditional desktop file systems' in terms of the project's key success metrics?
2. What interaction techniques best support efficient and intuitive file manipulation in AR (e.g. manual spatial organization, automated sorting, or gesture-based interactions)?

**References:**

- [1] 2018. *Spatial - Collaborate from Anywhere in AR*. Retrieved February 20, 2025 from <https://www.youtube.com/watch?v=PG3tQYIZ6JQ>
- [2] BumpTop - Open Source 3D Physics Desktop. Retrieved February 20, 2025 from [https://bump\\_top.github.io/](https://bump_top.github.io/)