

Exploring and Slicing Volumetric Medical Data in Augmented Reality Using a Spatially-Aware Mobile Device

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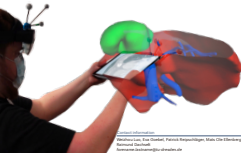
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Motivation and Basic Idea

Our goal is to address the lack of immersion and intuitive input of conventional systems.

Combine Augmented Reality (AR) with a spatially tracked tablet

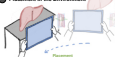


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Concepts for Volumetric Data Exploration

1 Placement in the Environment



We aim to present a novel way for physicians to interact with medical scans from MRI or CT imaging to analyse them for diagnosis and to prepare for surgeries or other procedures.

We thus present techniques that facilitate this overall concept.

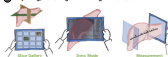
2 Transformation



3 Exploration in Detail



4 Capturing, Revisiting and Working with Slices



Current Prototype

To demonstrate our concepts, we realized a proof-of-concept prototype consisting of a **HoloLens 2**, a **Surface Pro 6** tablet and a **OptiTrack** motion tracking system.

We implemented our core techniques in the **Unity 3D** engine, utilizing the **Mixed Reality Toolkit (MRTK)**.



▲ **Free Exploring and Revisiting:** Users can explore by moving the tablet spatially and walking around. Interesting slices can be captured and revisited later.



▲ **Freezing then Annotating:** The current cross-section can be frozen on the tablet, and users can move for a comfortable posture and then further work on it.



▲ **Transparency Setting:** When exploring the AR model, the transparency (adjustable) of the model in front of and behind the cutting plane differs.