Automatic Generation of World in Miniatures for **Realistic Architectural Immersive Virtual Environments**

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1 Introduction

• World in Miniature (WIM): Scene replica as 3D map [1] Many challenges such as sufficient scale of scene extract

• Our approach:

- Automatic WIM generation through scene analysis
- Applicable to indoor/outdoor/mixed scenes
- Meaningful extract & context
- 3D user interface for WIM adaptions

2 Methods

(1) Automatic preprocessing based on Andújar et al. [2]:



• Steps 1-7: Scene decomposition into logical units, e.g., rooms 8: Approximated 3D floor plan • Step



Fig. 1: WIM with user avatar (red, inside building), location hints (red lines and pointer), and 3D user interface (top, yellow and grey) for extract manipulation, located on a floating table top.

3 Preliminary Results

- Appropriate workflow for automatic generation of WIMs of architectural scene
- A few limitations such as missing extract and context optimization for non-axis-aligned scenarios (Fig. 3)

(2) Continuous WIM adaption during runtime:



• Extract: Selection & preparation of a set of adjacent logical units • Context: Parts of the approximated 3D floor plan











Fig. 3: Top: WIMs for same scene position with highlighted refer-



Fig. 2: WIMs embedded as floating model into their scenes.

ence objects, left: axis-aligned; right: non-axis-aligned; Bottom: floor plans (red: extract; white:context) of included scene areas

References

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