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 adaptations

2 Methods

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

- Free Space Map
- Extended Chamfer Distance Map
- New Neighborhood Optimization
- Cluster Map
- Polygonal Merging
- Polygonal Description
- Cluster Merging

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

(2) Continuous WIM adaption during runtime:

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

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)

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.

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

Fig. 3: Top: WIMs for same scene position with highlighted reference objects, left: axis-aligned; right: non-axis-aligned; Bottom: floor plans (red: extract; white:context) of included scene areas

References