

Design and Development of a Virtual Reality Application to support Patient Education in Radiotherapy

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IN THE HELMHOLTZ ASSOCIATION

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Research for a Life without Cancer

Introduction

- doctor-patient-relation changes
 - shared decision-making process
 - increasing information needs [1]
- high complexity and technical equipment intimidates patients
 - anxiety and distress [2]

Approach

- virtual reality application to enable realistic visualization of radiotherapy process and concepts
 - improve understanding
 - prime for radiotherapy
- find best practices for developing virtual learning environments



Fig. 1: Screenshot of the designed therapy room with a LINAC, CT and some scanned objects.

Material and Methods

- 3D scans of a therapy room
- design of a VR environment with Unreal Engine 4 and HTC Vive

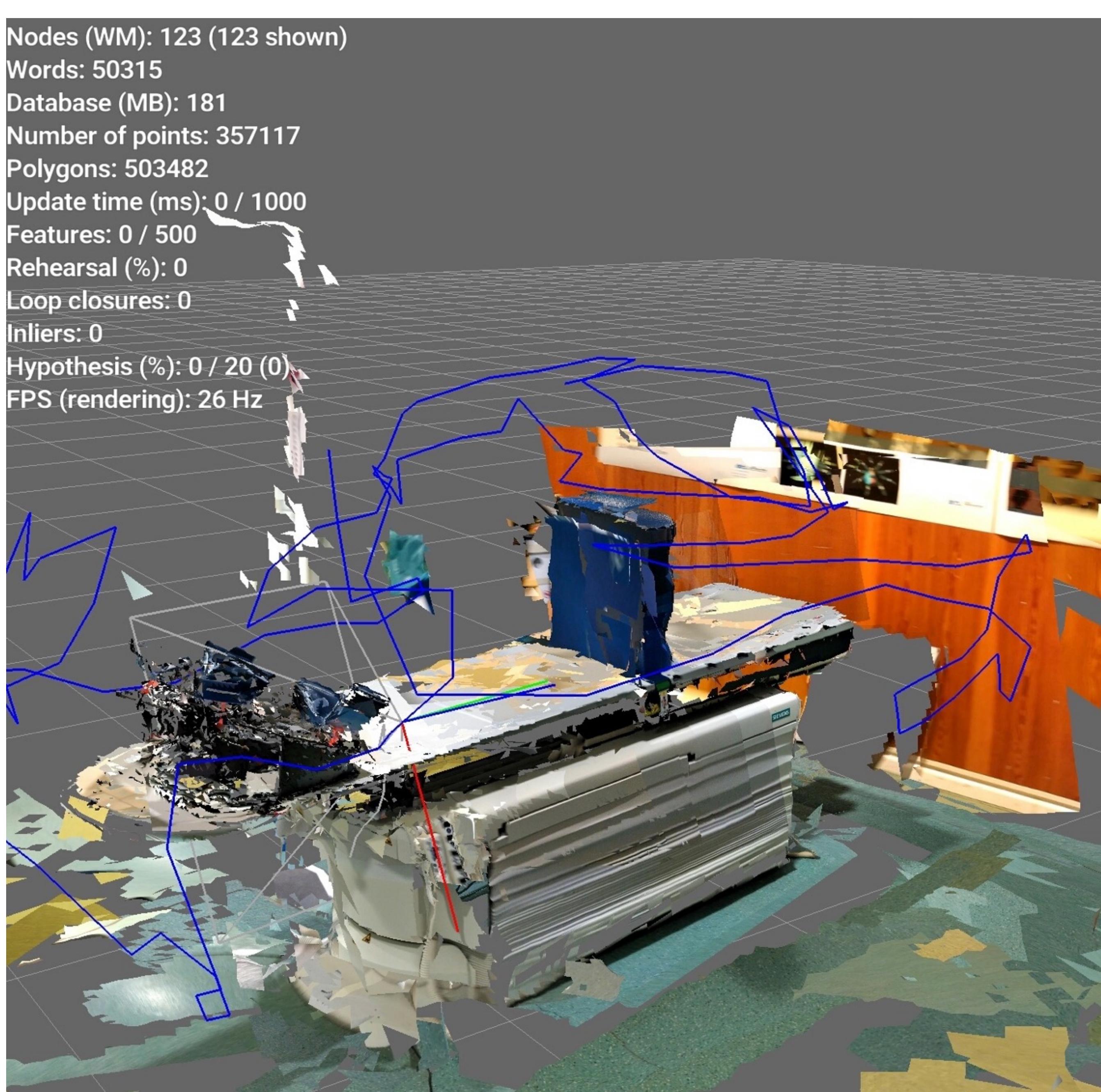


Fig. 3: Live visualization of a 3D scan using the RTAB-Map app.

Outlook

- create segmented transparent patient model
- record audio instructions and explanations
- scan more objects for even more real experience
- design lesson that covers one radiotherapy concept

Acknowledgements

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Fig. 2: real (left) and scanned (right) CT scanner with good result

Results

- example scene with a moving LINAC and table in a modeled irradiation room with other scanned objects
- best practices for modelling 3D environments, 3D-scanning & post-processing in acceptable quality

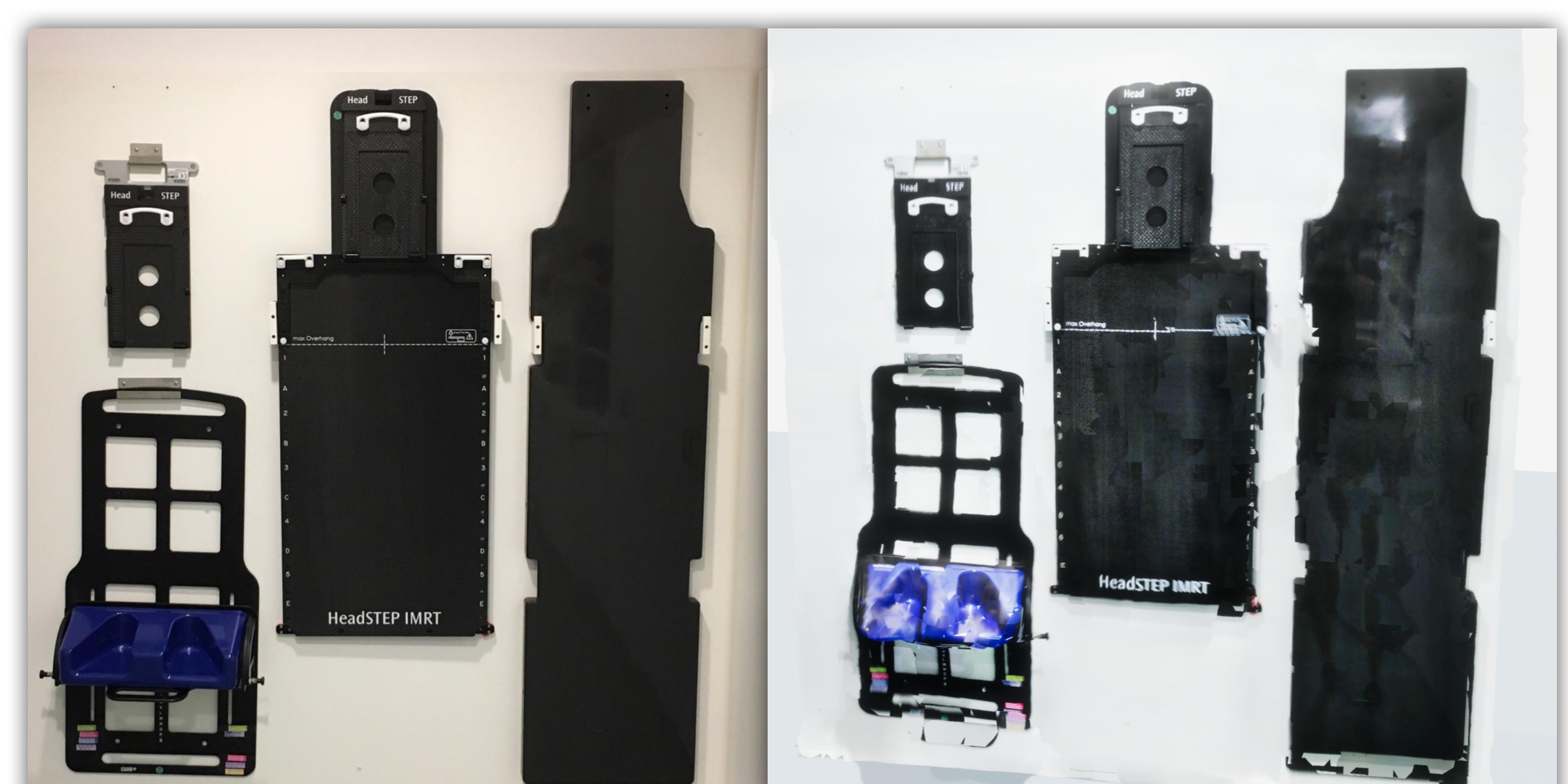


Fig. 4: real (left) and scanned (right) patient bedding tools

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[1] Charles C et al. Soc Sci Med 1999

[2] Elsner K et al. JMRS 2017