
A VR application for planning processes for nursing homes

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JVRC 2011 workshop on
“Accessibility Engineering with User Models, Simulation and VR”

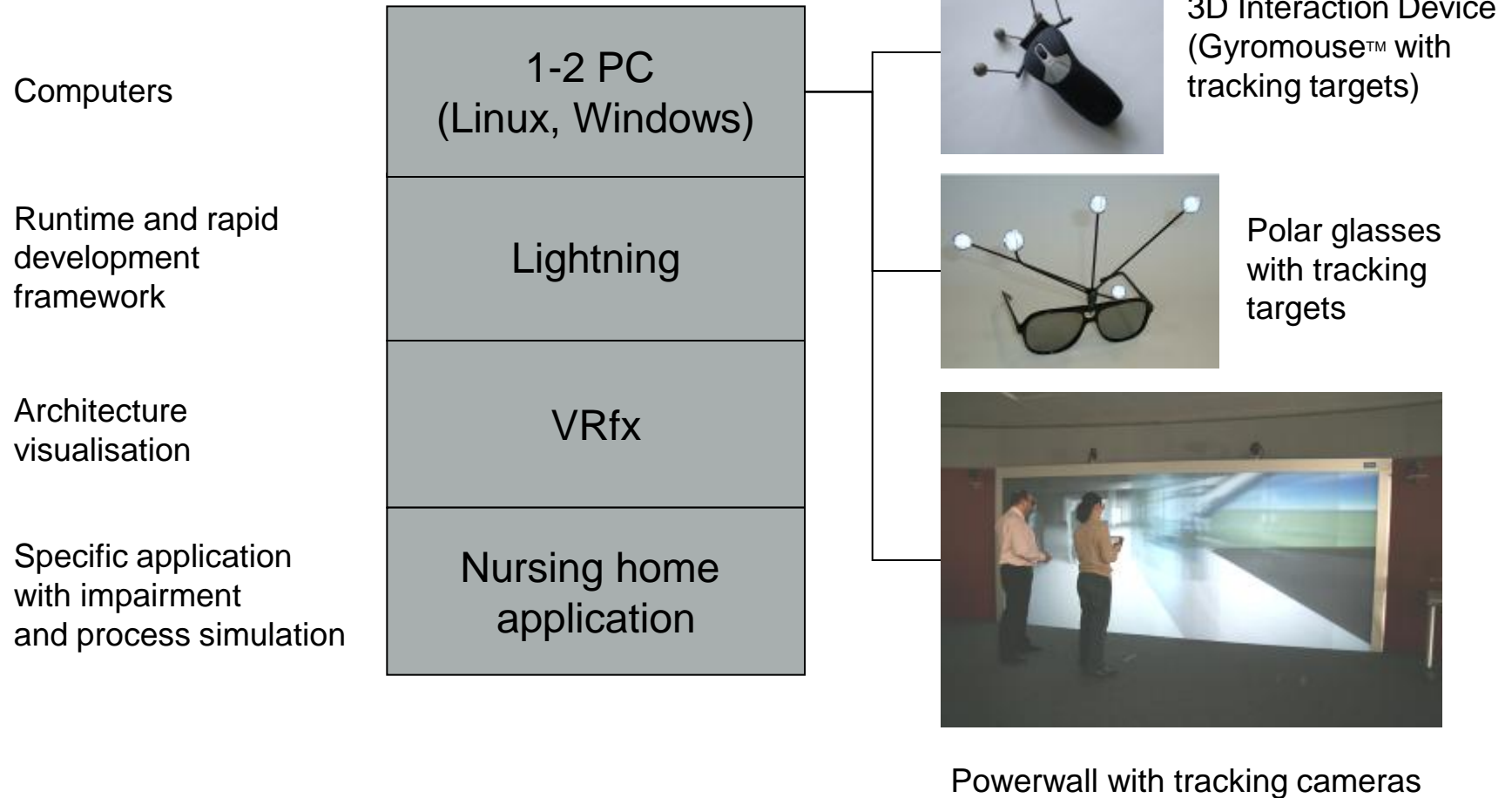
Problem

- Panning of nursing homes is a complex process
- Different actors / concerned parties
 - Operating organisation/company (operation, profit)
 - Building owner (real estate)
 - Architects and construction planners (construction, modification)
 - Municipality (administrative decisions)
 - Benefactors, nursing insurances (quality control)
 - Association for statutory accident insurance and prevention in the health and welfare services (BGW) (occupational safety, consultancy)
 - Employees (care)
 - Residents (beneficiaries)
- Limited involvement of residents' interests representatives
- Primary actors have limited knowledge about the residents' needs
- Better understanding of »user needs« and media for their communication needed

Concept

- Communicate by providing an experience from the beneficiary's perspective
- Virtual Reality (immersive technology)
 - Realtime graphics
 - Stereoscopic
 - 3D interaction
- 1st and 3rd person perspective
- Focus on visually relevant aspects
 - Realistic navigable visualisation from the residents' perspective
 - Adapted eye positioning (restricted navigation speed, wheel chair height)
 - Impaired vision simulation through filters
- Build on an established construction visualisation workflow

System architecture



The application



Variants management



Impairment simulation



Process simulation



Select design variants 1-3



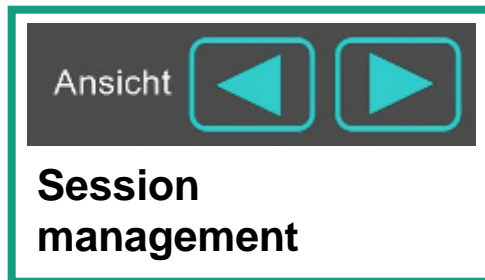
Perspective (wheelchair)



Process simulation
(nursing bed navigation)



Visual impairment (cataract)



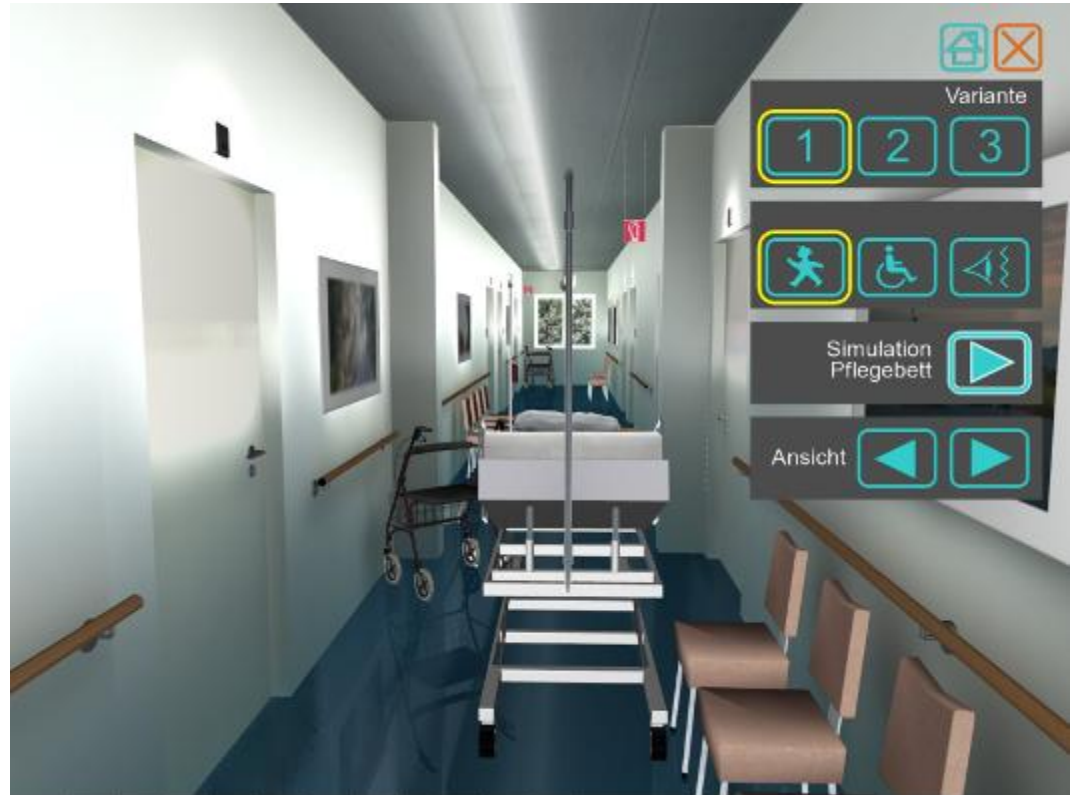
Exemplary use case

- Building modification project
- Long and narrow corridors
 - Redesign the space
 - Impact of colors and textures on dementia patients
 - Contrast design for visual impairments
 - Structuring for acceptable perception and walking distance
- Three variants modelled and visualised



Results Variant 1

- Unmodified corridor
- Cold and uncomfortable appearance
- Messy situation and lack of space
- Problems in manoeuvring nursing beds
- Long distances
- Dementia patients perceive blue specular floor as water
- Unfavourable contrasts and dazzle



Results Variant 2

- Corridor expansion areas
 - Less uniformity
 - Space for manoeuvring and storage
- »Water floor« perception replaced by »solid ground«
- Contrasts optimised by appropriate lighting and signage design



Results Variant 3

- Visually shortened corridor sections
- Care islands for tidiness and optimised care processes
 - Place to leave rollators
 - Storage for care products
 - Place for electronic documentation



Conclusions

- Positive use case results supported by VR as a communication medium
- Use case results not exclusively due to VR application
- Positive feedback from demonstration at BGW conference
- The application is only a demonstrator
- Generalisation and more functions needed
- More developments in FP 7 possible
- VERITAS will further develop the approach



Thank you

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