

New Challenges in VR using Game Engines?

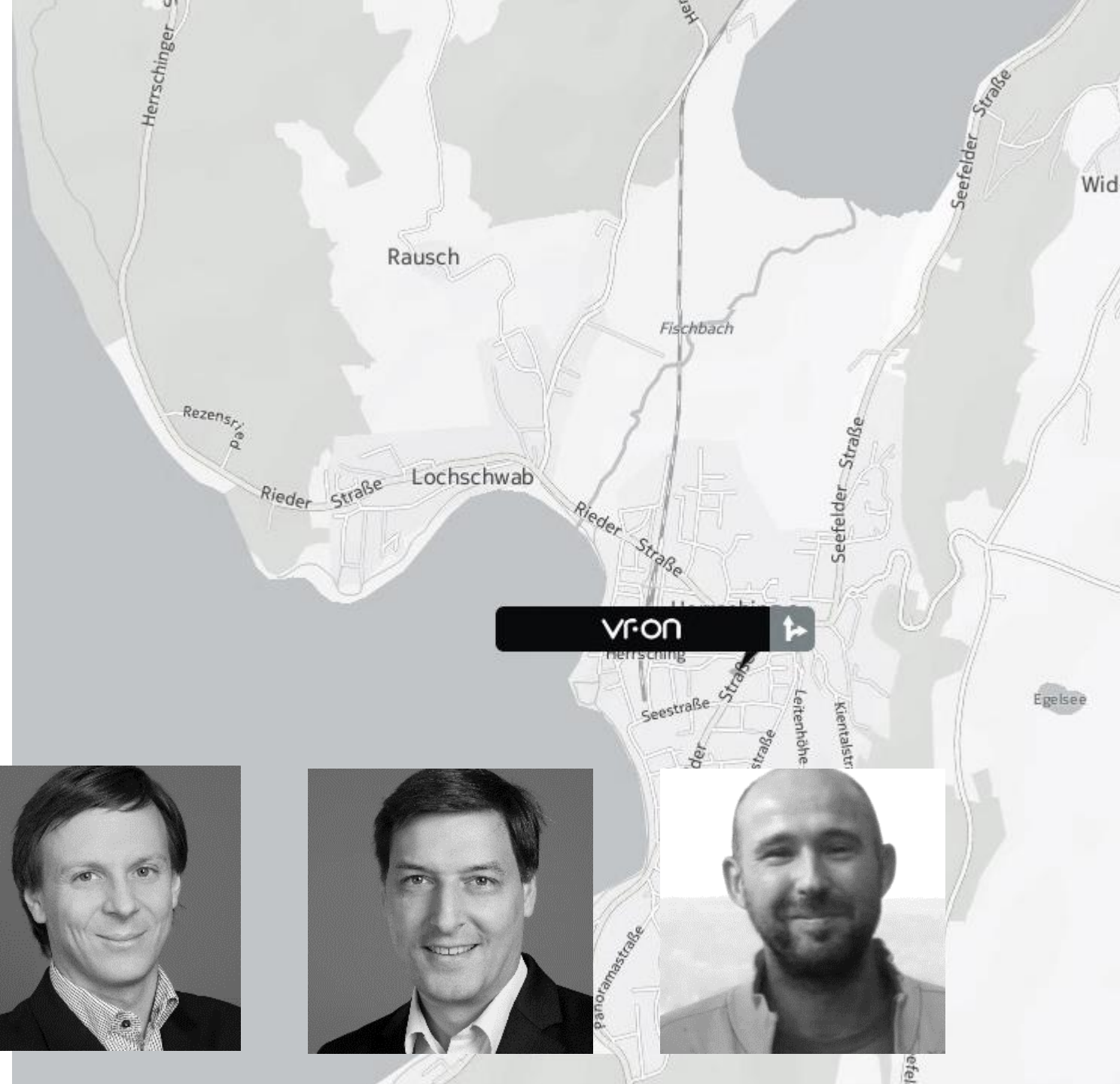
Dr. Ralf Rabätje



vr·on

vr-on GmbH

- Founded 01/2016
- Based in Herrsching
- Currently 7 Employees



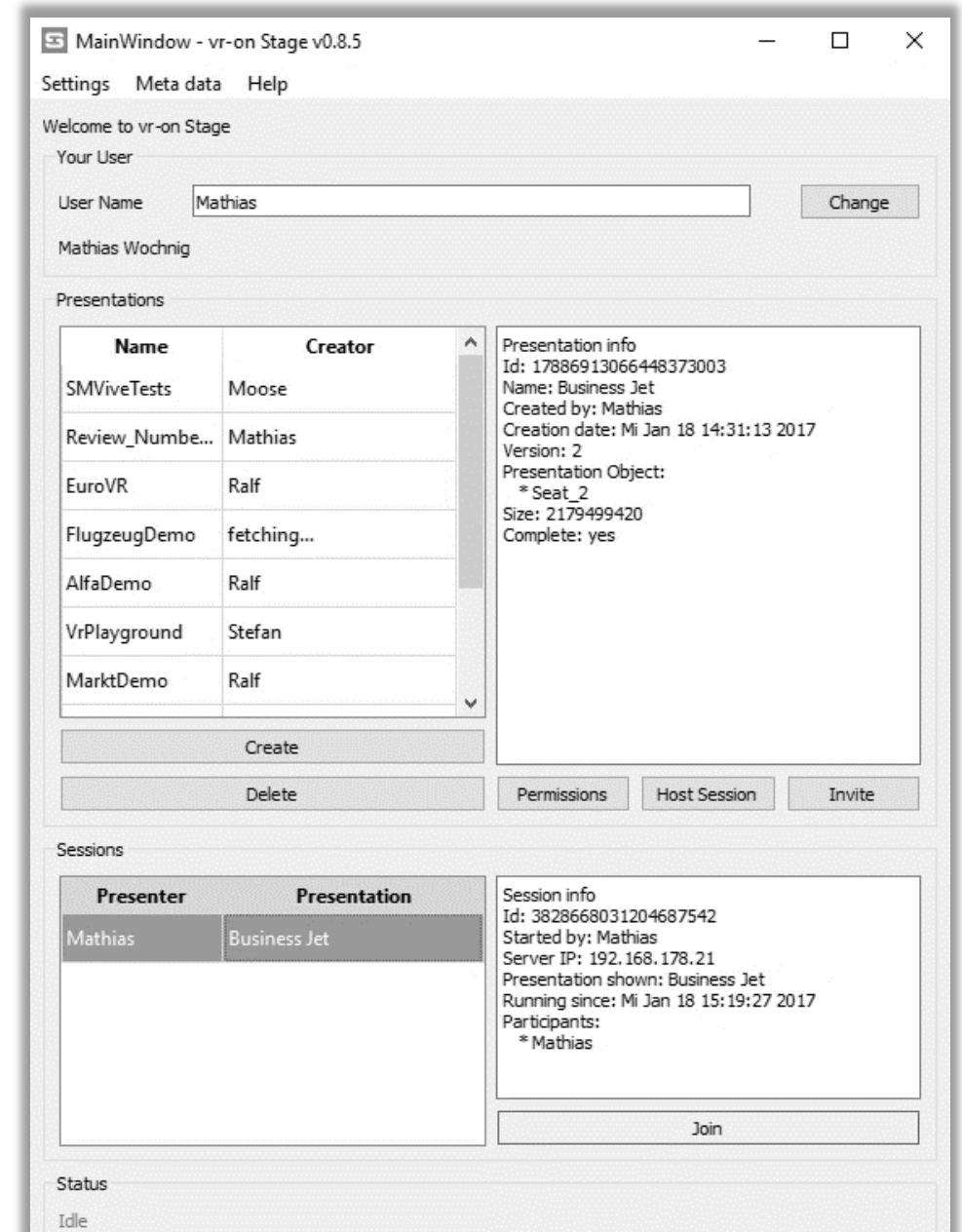
Goals

- Bring consumer VR HW/SW into industrial applications
- Provide a secure platform for VR collaboration



Product

stage: VR presentations & collaboration



Collaboration

Support of different locations

User-Authentication

Presenter Mode



Interaction

Avatars

Interaction & Navigation Concepts

Metadata handling



Industrial Useases



Design review

- ✓ Co-ordinate Engineering and Design
- ✓ Virtual Product Clinics

Layout Planing

- ✓ Factory planning
- ✓ Architectural walk throughs
- ✓ Virtual shop planning



Others

- ✓ Assembly Simulations
- ✓ Digital factory: Training for Service & production

Old Challenges

- Very few VR companies
- Expensive
- Closed and proprietary tools
- No support for new HW



Consumer HW / SW



UNREAL
ENGINE



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Virtual Reality in Industry

Focus on Powerwall and CAVEs



Consumer HMDs



Expectations on Game Engines

- Fast rendering pipeline
- Good visual quality
- Support HMDs
- Provide multiplayer support
- Physic integrated
- Interactions



Industrial Usecases

With need of tactile or force feedback

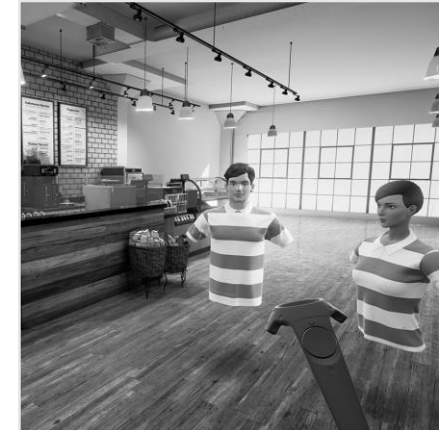
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Current Status in GameEngines

- Collision Detection
- Convex Decomposition
- CCD Algorithm
- Physical simulation with respect to gravity and constraints
- Provide a rumble effect

New Challenges with GameEngines

- Datapreparation
 - 90Hz put a high demand on polygon count
 - Collision detection adds an additional load
 - GameEngine require additional tools for tessellation etc.
- Approximation
 - User does not get a feedback on distance between convex hull and actual surface
- Toolset
 - GameEngines are more like a tool set than a real application
- Collaboration
 - User needs to understand concept of networking
- Haptic devices
 - Interfaces
 - What should be calculated locally and what on the GameEngine server?

Are you on?