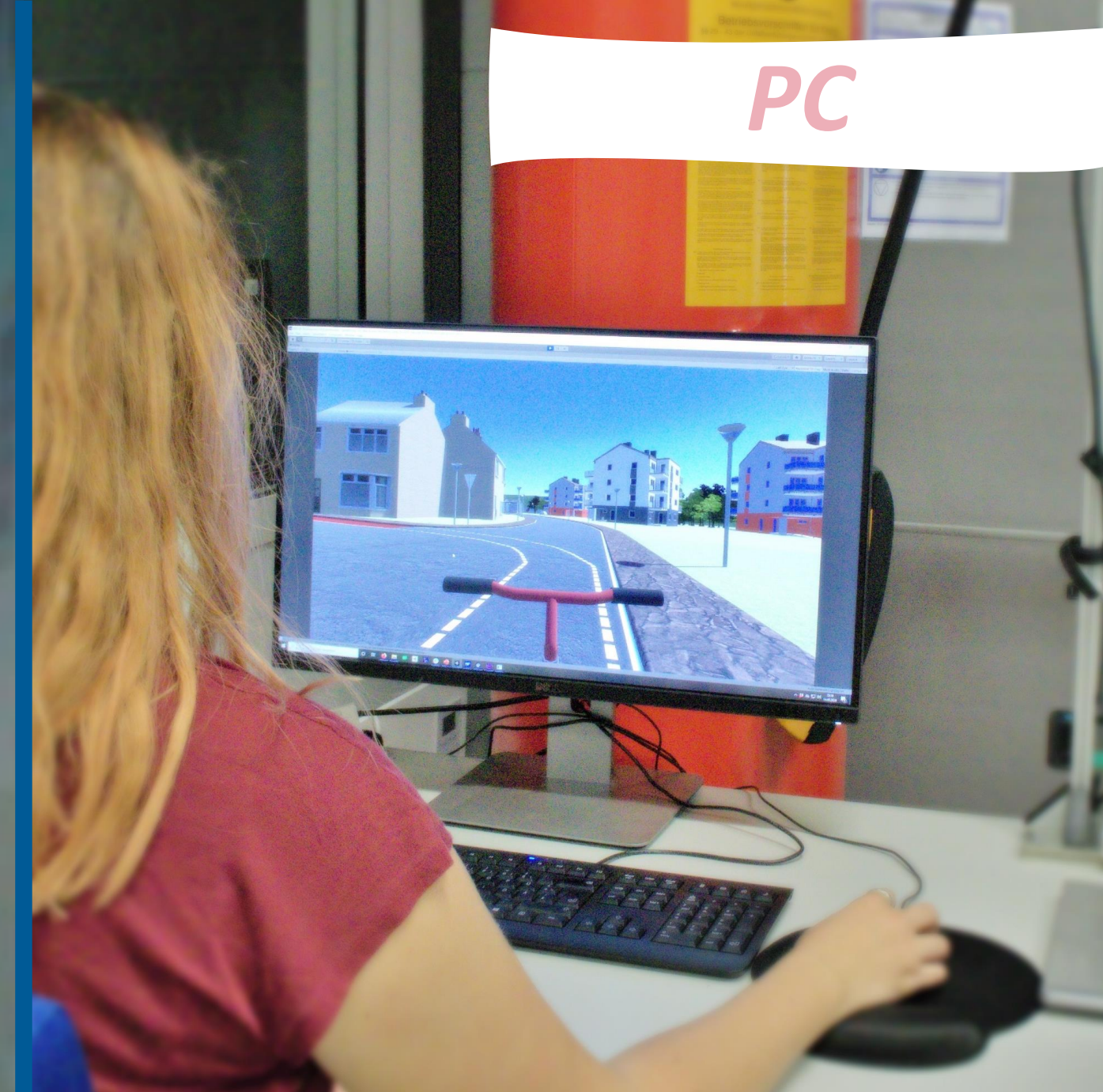CAVE

PC

VR Headset

The Next Stage of Road Traffic Education: A Mixed Reality Bicycle Simulator to Improve Cyclist Safety

**Tamara von Sawitzky, Thomas Grauschopf, and Andreas Riener**

USE CASES

Traffic Safety Education

› Students can experience dangerous situations and learn to detect hazards in traffic

› Interactive learning

Developing and Evaluating Novel Concepts to Increase Road Safety for Cyclists

› Novel safety concepts with warnings displayed on HUDs based on Smart Traffic (connected vehicles)
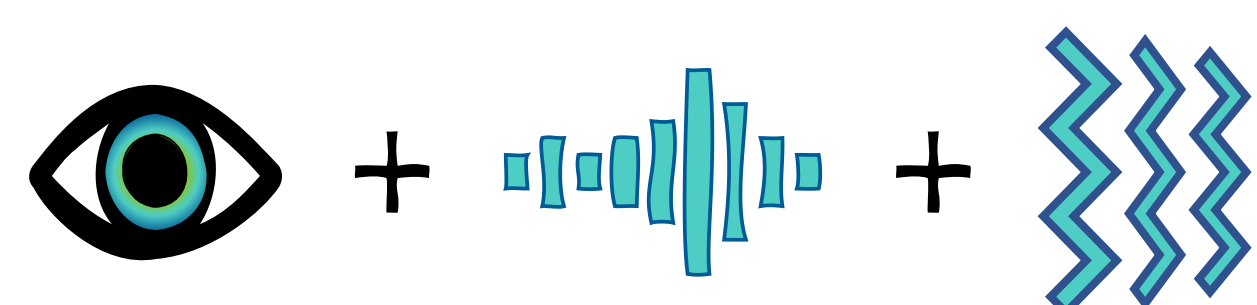
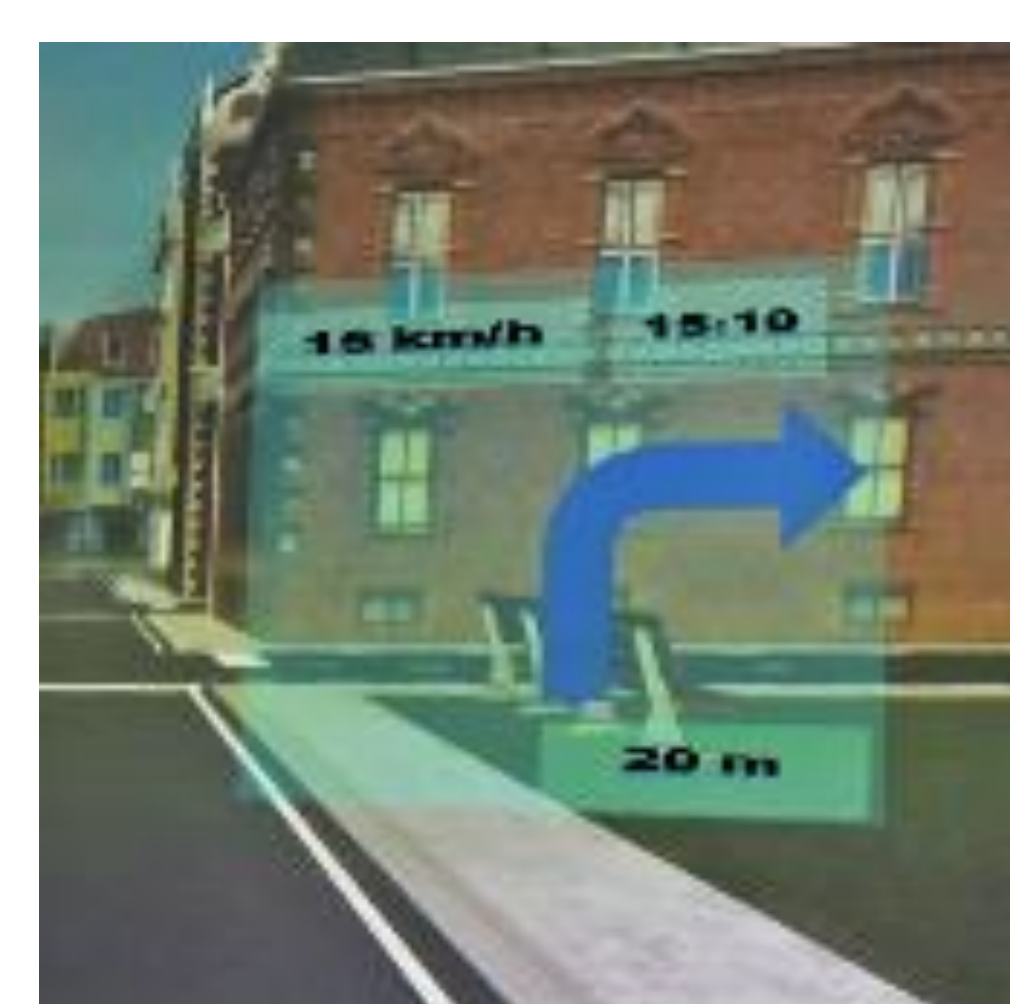› New infrastructural concepts

SIMULATOR COMPONENTS

CYCLIST SAFETY SERVICE

Services

› Navigation (comfort)

› Warnings based on location services and smart traffic

- Wrong-way cycling
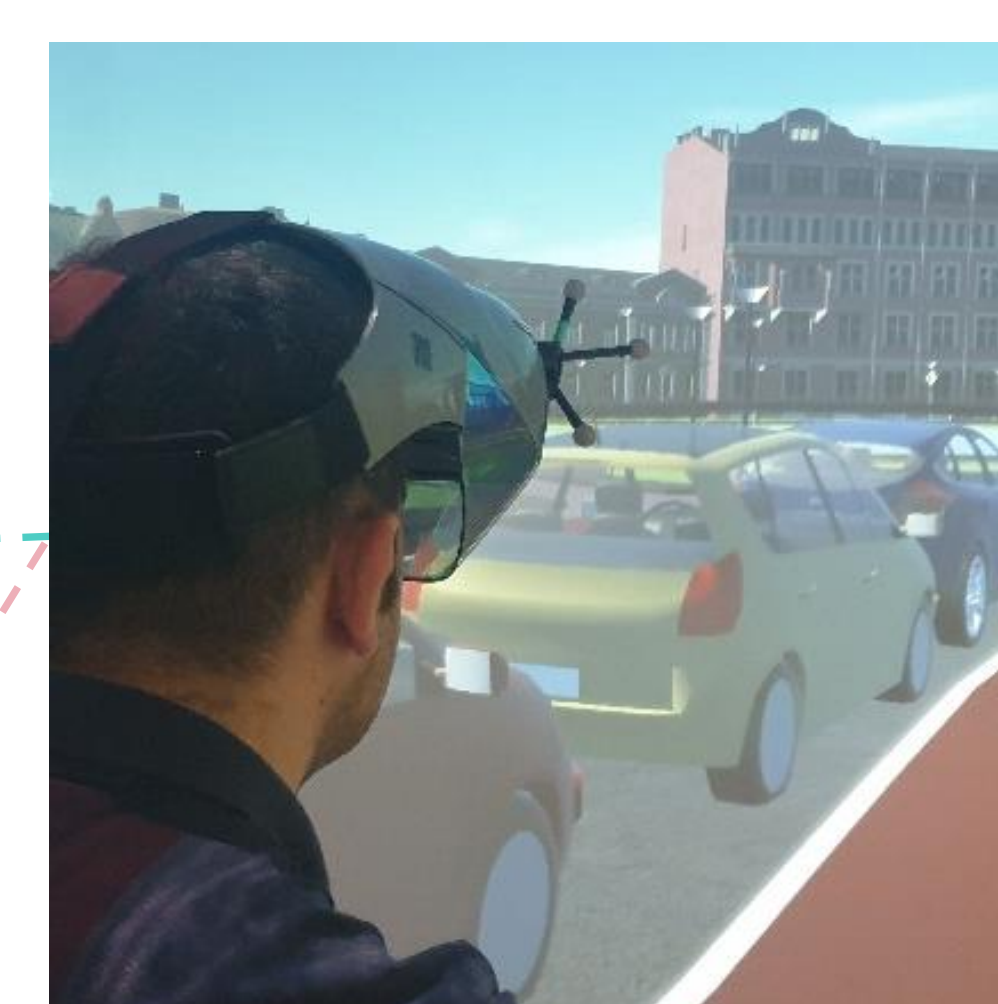- Approaching vehicles
- Occupied, parked vehicles
- …

Services are modularly extendable

HEAD-UP DISPLAY

Virtual HUD

VR Headset

CAVE

PC

External HUD

SIMULATION ENVIRONMENT

› Unity 3D

› Input for bicycle movement

- PC
  ◦ Mouse
- CAVE and VR-glasses
  ◦ Head movements
  ◦ Steering angle and velocity from physical bike on roller trainer

NEXT STEPS

› **Multi-user integration**

› **Open Source Project (planned) including**

- GUI
- Example scene
- Cyclist safety service (base)
- Documentation

Technische Hochschule Ingolstadt

JⱮU JOHANNES KEPLER UNIVERSITÄT LINZ