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OPERATING CONCEPT FOR AUGMENTED REALITY APPLICATIONS

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OPERATING CONCEPT FOR AUGMENTED REALITY APPLICATIONS

Technical task:

In Augmented Reality (AR), virtual content is added to the real world. Typical AR representatives or technology carriers are head-up displays in vehicles, AR applications on smartphones or data glasses such as the Microsoft HoloLens. The operation, movement and editing within the AR world is mainly carried out via gesture control and without the addition/combination of other mobile devices. In addition, an individual operation takes place, i.e. detached from the influences of other users.

Initial situation:

Mobile devices do not deliver the desired quality with regard to the experience of the information/objects displayed. Glasses have disadvantages with regard to operability, because usually by gestures or controller/pusher (cumbersome with complex operating sequences - e.g. selecting several objects, manipulating, calling/operating multi-level menus). Collaborative work in the AR environment is practically impossible.

Solution:

Combination of AR glasses and mobile device

Aspect 1:

Display of different perspectives (AR glasses: 3D view/holograms in the direct field of view of the user, displayed in the real world; mobile device: Optimal, freely selectable and scalable view for the respective application (e.g. top view, side view, etc.). In addition, the outsourcing of complex menus and functionalities to the mobile device and live synchronization between the mobile device and AR glasses (e.g. objects are moved on the mobile device, which also leads to the same movement, correct in perspective, on the AR glasses).

Aspect 2:

In addition to aspect 1, live synchronization across multiple users is possible. As well as the above mentioned object manipulation (or other change/setting) is shared with several users on their glasses and mobile device. The master/slave or trainer/trainee function allows changes only by certain persons. In addition, all changes (e.g. move/turn objects) are displayed to each user, perspective correct, according to his position/view.

Advantages:

Aspect 1:

- Disadvantages of each technology are compensated by the other.
- High experiencability of the AR worlds through AR glasses
- Simplified, intuitive operation, even in complex situations/menus, through mobile device
- Time-synchronized and parallel for all users available, different views facilitate orientation and editing (e.g. move, manipulate, adjust) in the AR world

Aspect 2:

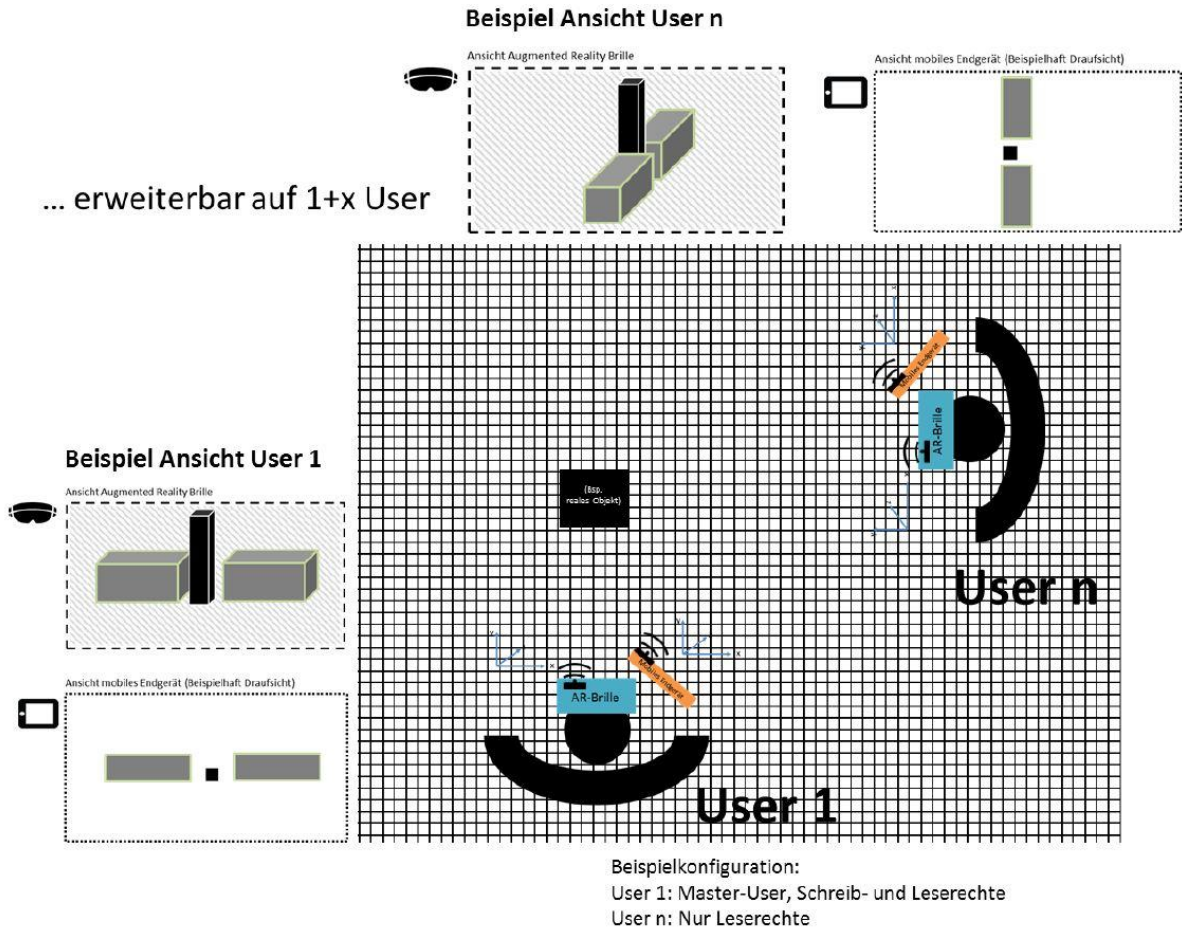
- Guided interaction by master/trainer facilitates discussions or discussion of issues in AR worlds
- Individual view on facts facilitates orientation and discussion of facts in the AR world

Possible application:

1. device hardware (sensor technology) enables localization in the room, recognizes each other (see Fig.1)
2. synchronization of the position between glasses and mobile device via data connection (see fig.2)
3. user selects ideal view
4. device integrated arithmetic units determine the position of the AR objects to be displayed
5. device integrated displays show AR objects, correct position and perspective (see fig.1)

In aspect 2, steps 1-5 are performed individually for each user, only the perspective is different. or the degrees of freedom for settings and object manipulations.

Picture 1: Multi-View AR-World



Picture 2: Connection - AR-Topology

