Augmented Reality Display of Social Media Profiles: Analyzing the "Synthetic Situation" in a Sociological Interaction-Experiment

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Theoretical Background

Goffman's notion of the **interaction order** asks for the rules of the production of social order in interaction situations, how humans present themselves in the public, and how they synchronize and harmonize actions. Goffman's interaction theory assumes (1) bodily co-presence, (2) pure face-to-face-interaction, and (3) the use of the "naked senses". These assumptions are no more valid in **mediated societies**. Using digital media people can create geographically distributed interaction situations that are enriched with additional information.

Research Questions

(1) How do the interaction orders differ between naked and synthetic situations?
(2) How did participants react to the AR display system?
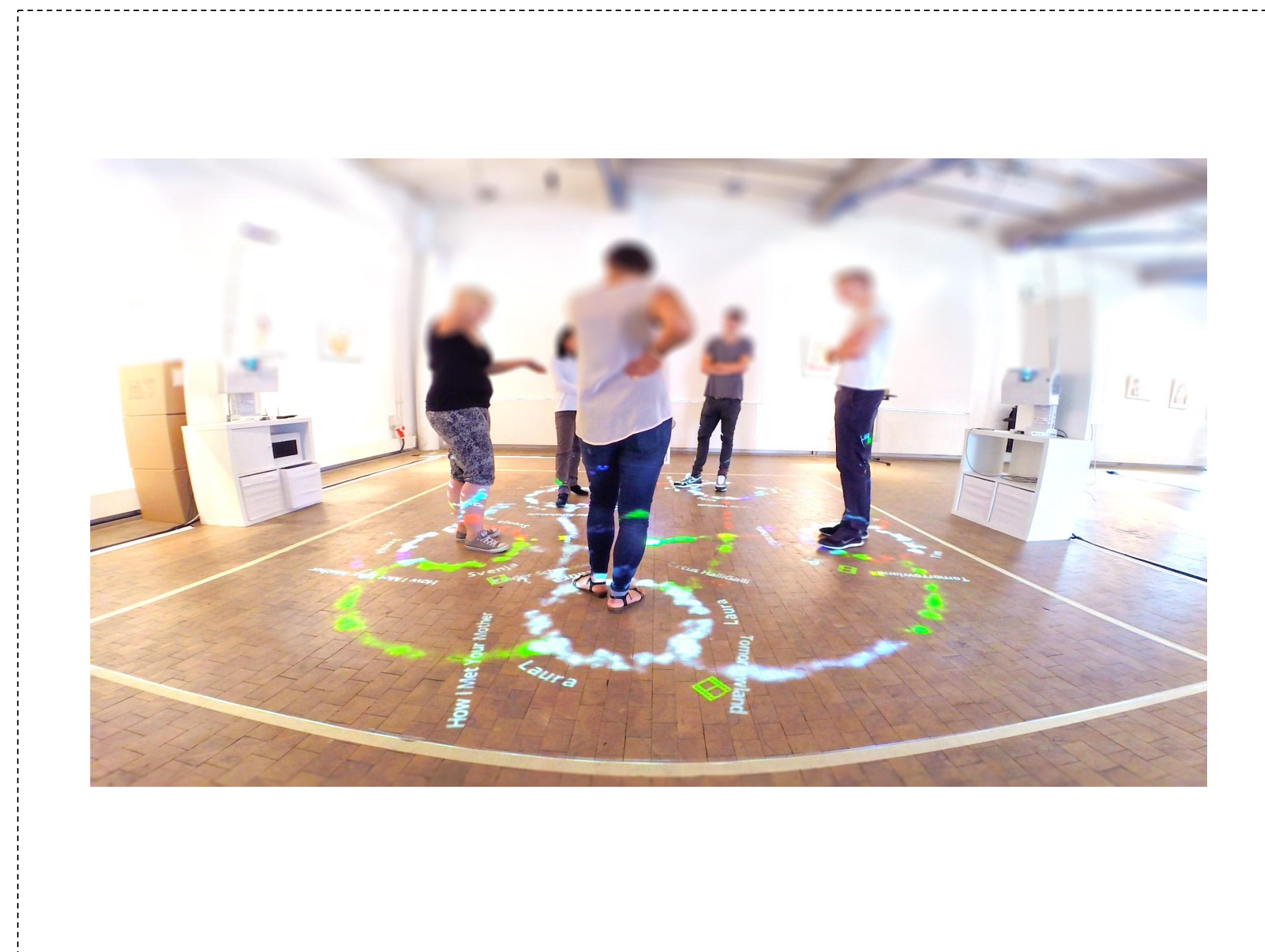

The Naked Situation ...

... is an „environment of mutual monitoring possibilities, anywhere within which an individual will find himself accessible to the naked senses of all others who are ‚present,' and similarly find them accessible to him." (Goffman 1964)
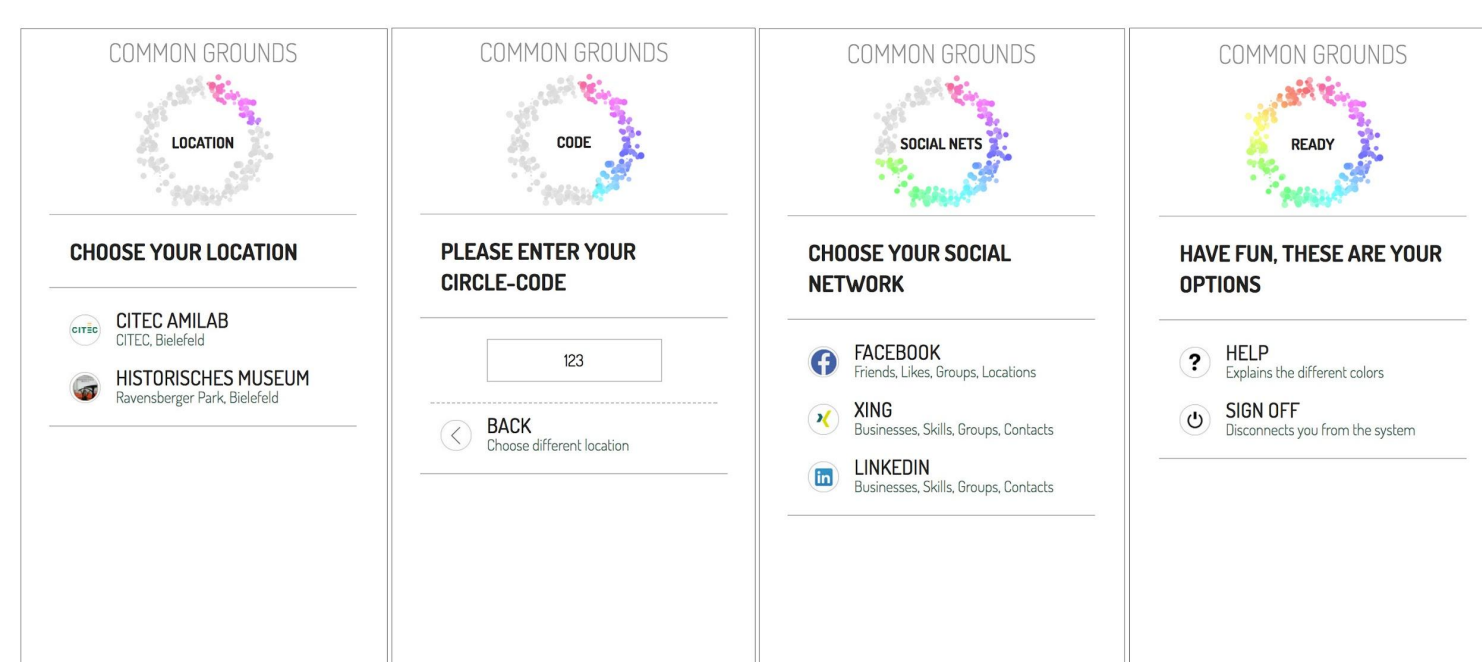

The Synthetic Situation ...

... is a mediated interaction situation that is enriched with additional information interaction partners can not access without the media. The information is "situationally present" and transforms the interaction order. (Knorr Cetina 2009)

Experiment Design

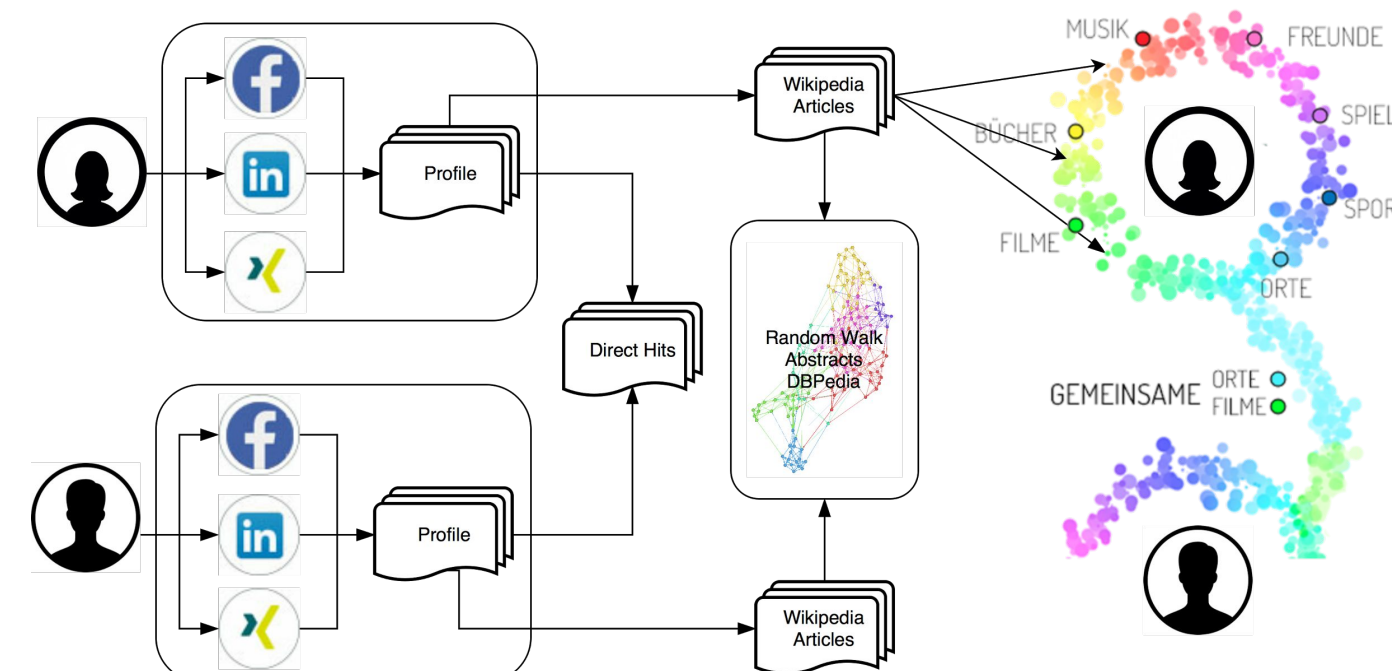## Accessing social media profiles

A website was provided that allowed participants to sign up using their Facebook/LinkedIn/XiNG profile.

During the process they were asked to grant access to most of their profile data, e.g. likes, friends, working history, groups.

Mapping data to Wikipedia

After registration the profile data is extracted and mapped to a set of Wikipedia entities.

Based on their neighbors a Wikipedia similarity graph is constructed with edge weights computed as a pairwise similarity score based on a random walker model.

Once a match between two participants has been found (e.g. Paul McCartney ↔ The Beatles), its relevance is computed as a function of similarity and likelihood of being observed in a random sample of users.

Visualizing Data

Four projectors and tracking cameras show content attached to the participants' positions, creating a spatial augmented-reality display.

Each participant has a surrounding "circle" and "connections" to others with matching profiles. Both are made out of "bubbles" that each represent a piece of profile information.

They are colored based on their category (e.g. movies, books, locations, friends, groups, ...) thus showing the distribution of interests in one's own profile and in connections to others.

Study and Preliminary Results

Study Design

A group of participants were asked to spent **15 minutes** in a 16sqm area and to "get in touch with each other". After the experiment, a **random sample** was selected to take part in a **narrative interview**.

A total of **24 experiments** have been conducted, 17 of them with the AR-display enabled. **114 participants** took part in this study, 94% of them being students. A total of **59 interviews** were conducted, resulting in **17 hours of interview data** that have been transcribed and are being evaluated.
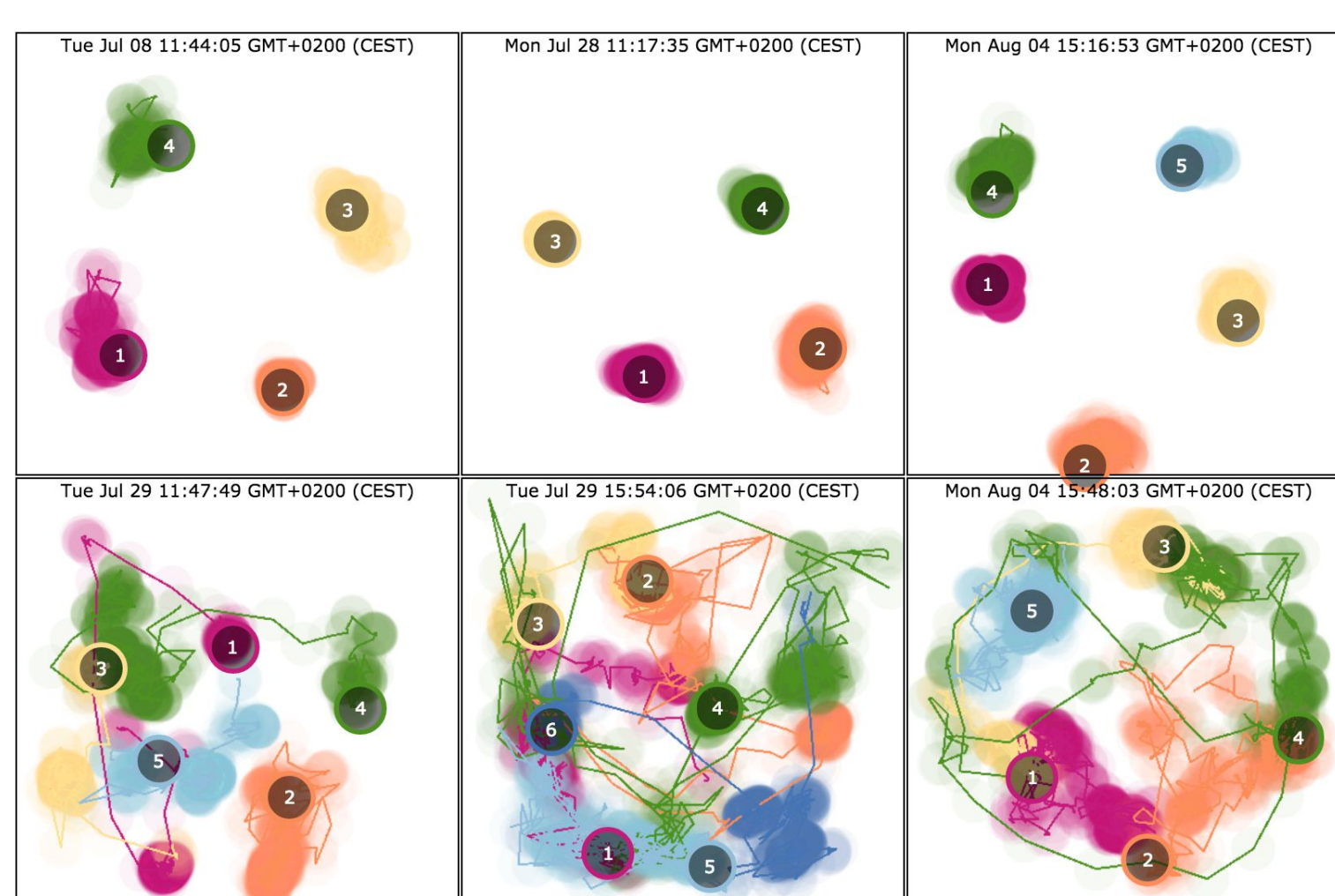
Movement patterns during the last 10 minutes of six selected trial runs.
(top: naked situation/AR disabled, bottom: synthetic situation/AR enabled)

Comparing Interaction Orders

Bodily Orientation
Synthetic situations allow new forms of bodily orientation.

"... we missed out on the whole communication with the face of the others all the time, because we always concentrated on the lines and circles..."

Group Integration
Synthetic situations are more disintegrated. Participants build more and smaller groups.

"I saw that I had a white connection with her and went up to her. But she had the feeling that white connections are not real ones and she looked for another contact and then I was quite irritated."

Shift of the discursive attention to technology & algorithms
The media system demands for attention and becomes part of the talk. The results the media system projects in the situation directs the topics in the talk.

Group Dynamic
Synthetic situations are more dynamic: there is more movement, more lively talk, less embarrassing pauses.

"Well, it was time to break this embarrassing silence and to say something. I think everyone felt like this, and we tried to explain 'Ok, look, we have a connection!'"

Structured topics based on responses

Profile Data
- Pressure for **profile maintenance** (e.g. to remove "embarrassing" and add "favourable" likes)
- Increased awareness for **data privacy**

Visualization (using spatial AR)
- **Loss of control** over information (unable to hide certain information from certain people)
- Enforces **information "symmetry"** ("the other person should not gain information about me without me knowing")
- Circle acts as a **representation of personal space**, "not to be crossed"
- **Loss of control over conversational flow** ("forced to talk about topics being displayed")
- Always-on display in peripheral view increases **risk of distraction**
- **Colors** are perceived as an **indicator for relevance**

Conversational process
- **Less explicit matches** would provide more **conversational freedom**.
- System considered **"helpful", "supportive"** by those that self-describe as shy or perceive small-talk as an "exhaustive" task.

Self-representation
- **Reduced control of self-representation** ("nobody shared the likes I felt most strongly about, I felt misrepresented and reduced to tv series")
- Desire to **showcase personal highlights** ("so that I can show a part of me that I especially like")

The projection based AR enforces **"information symmetry"** but puts pressure on discussing topics currently being displayed. New **Mixed-Reality glasses** like Microsoft HoloLens would provide an **asymmetric information display** without this pressure. On the other hand, participants couldn't exactly be sure what kind of information is being shown about them. This may lead to a **perception of information asymmetry** and **mistrust**.

This will be investigated in future work.