Faculty of Design

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Simulations in Service Design Prototyping: Drone deliveries with society-in-the-loop

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Simulations in Service Design Prototyping: Drone Deliveries with Society-in-the-Loop

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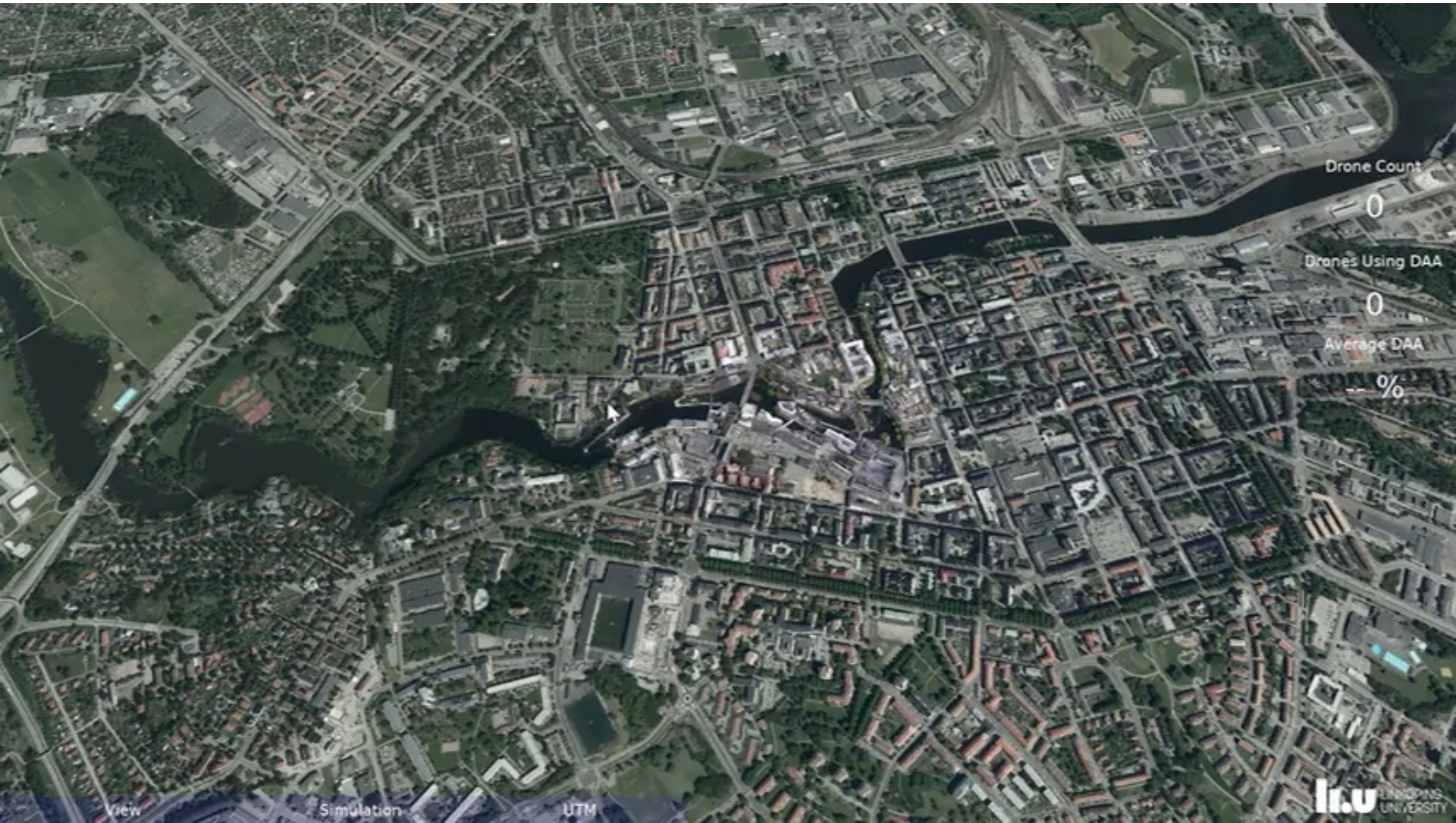
Purpose

- To explore
  - how **computer simulations** can be used
  - as **collaboratively divisible object**
  - for **citizen engagement**
  - in service design of drone deliveries
  - for students in a Swedish university city.

Simulating Drone Delivery Services



Prototypes manifest design ideas (Lim et al., 2008)

- **Filter** some aspects:
  - Appearance
  - Data
  - Functionality
  - Interactivity
  - Structure
- Can serve the **purpose** of:
  - Evaluation
  - Exploration of user experience, needs, and values
  - Generation of ideas
  - Communication

Simulations in Service Design

- **Test** a system before implementation
- **Visualize** multiple events, multiple agents, and dynamic processes
- Potential **complement** to desktop walkthrough

Research Questions

- How can computer simulations be used
  - for citizen engagement
  - in the evaluation
  - of drone delivery services for students in a university city?
- How can such computer simulations
  - inform the design process in comparison to a desktop walkthrough?

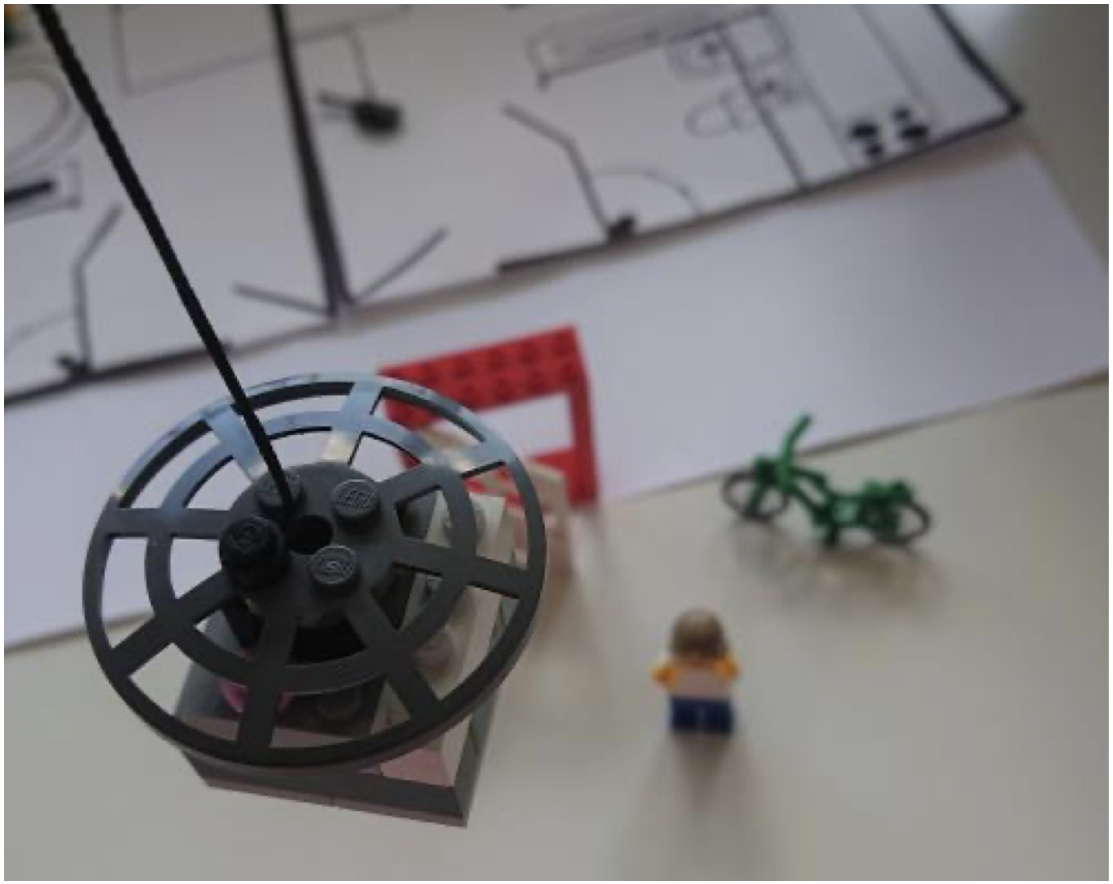
An Instrumental Case

- The design of a drone service for food delivery for students in a university city.
- Divergent concept sketching and selecte concept was illustrated using:
  - Service blueprint
  - Storyboard
  - Assumed persona

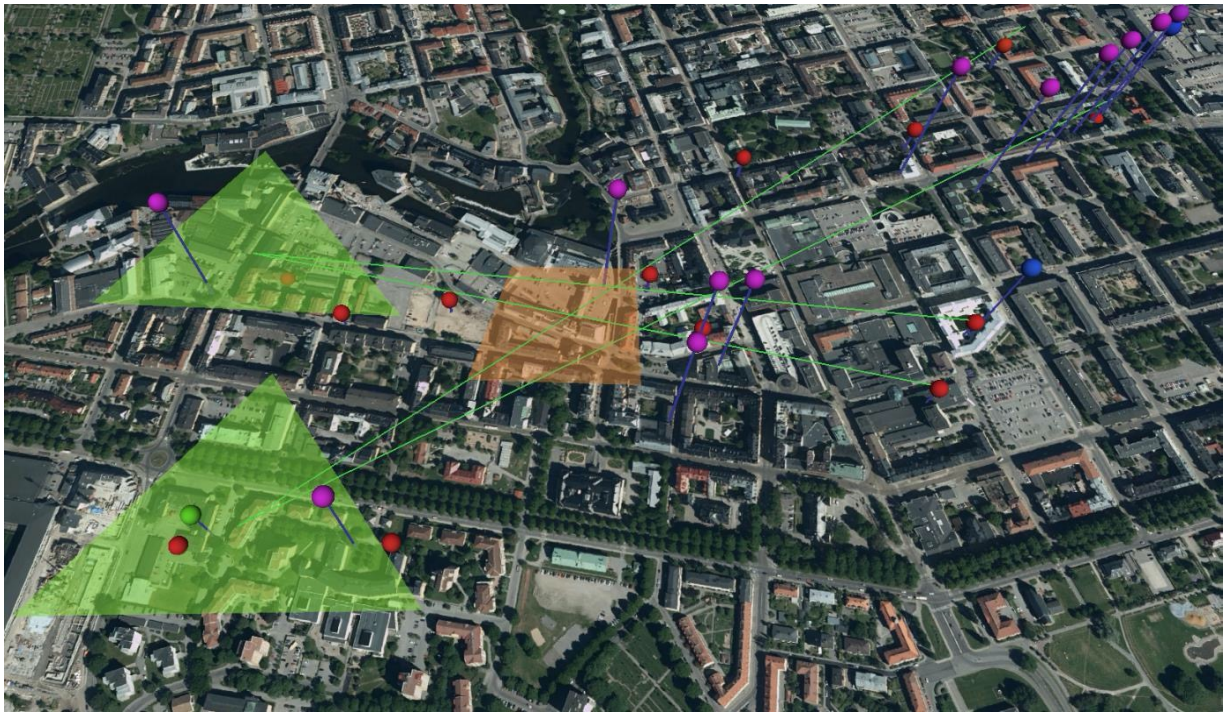
Four Workshop Sessions

- 7 participants split into two workshops with desktop walkthrough
- 6 participants split into two workshops with the simulation
- Five scenarios of use were discussed in each workshop:
    1. Order food from home
    2. The neighbour orders food at the same time
    3. The food is delivered to drop-off point down the street
    4. The food is dropped down by a wire from the drone
    5. Many want to order food on New Year's Day.

Desktop Walkthrough



Simulation

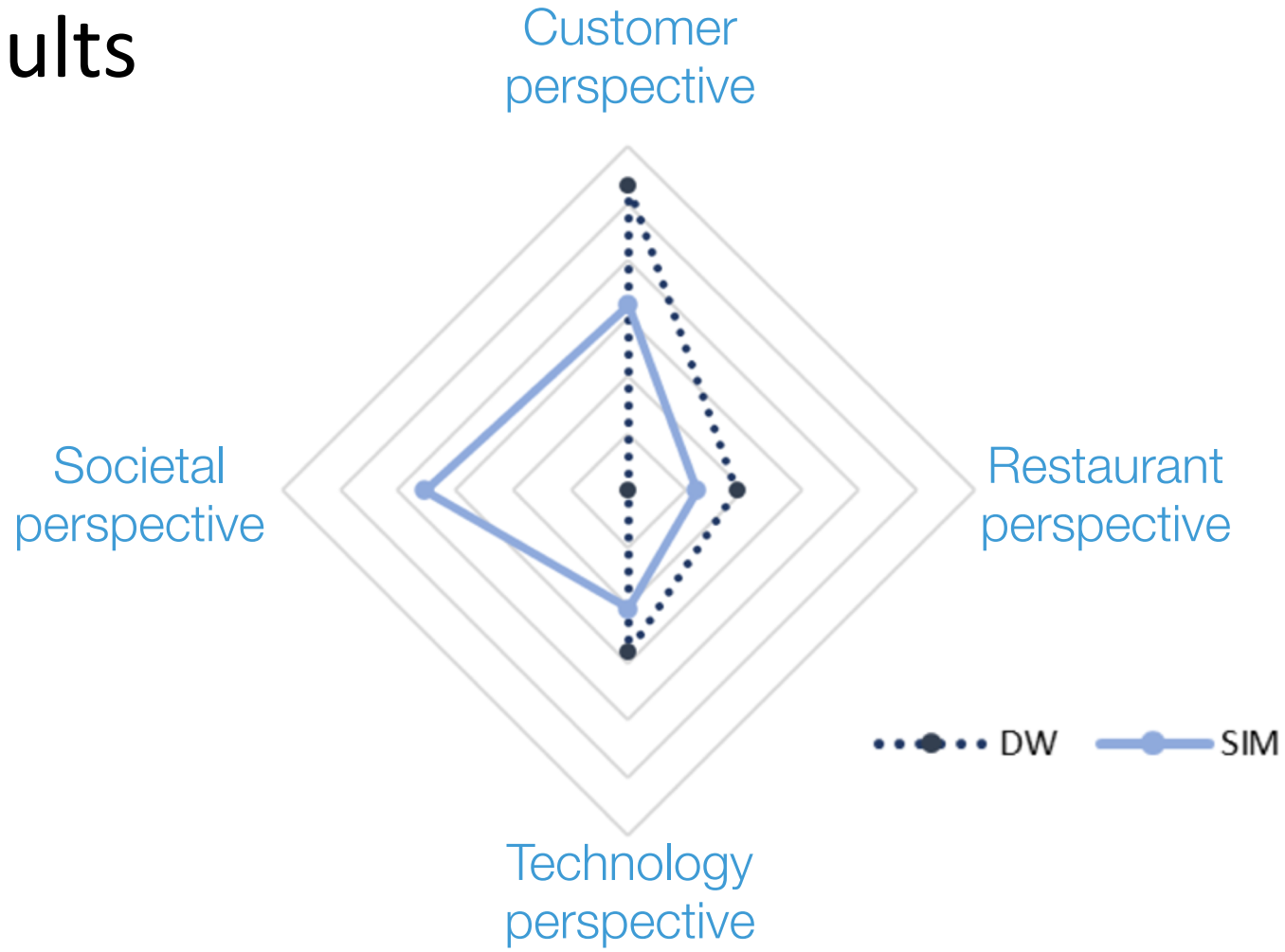


Background generated from GSD-Ortofoto25 and GSD-Höjddata, grid 2+ © Lantmäteriet.

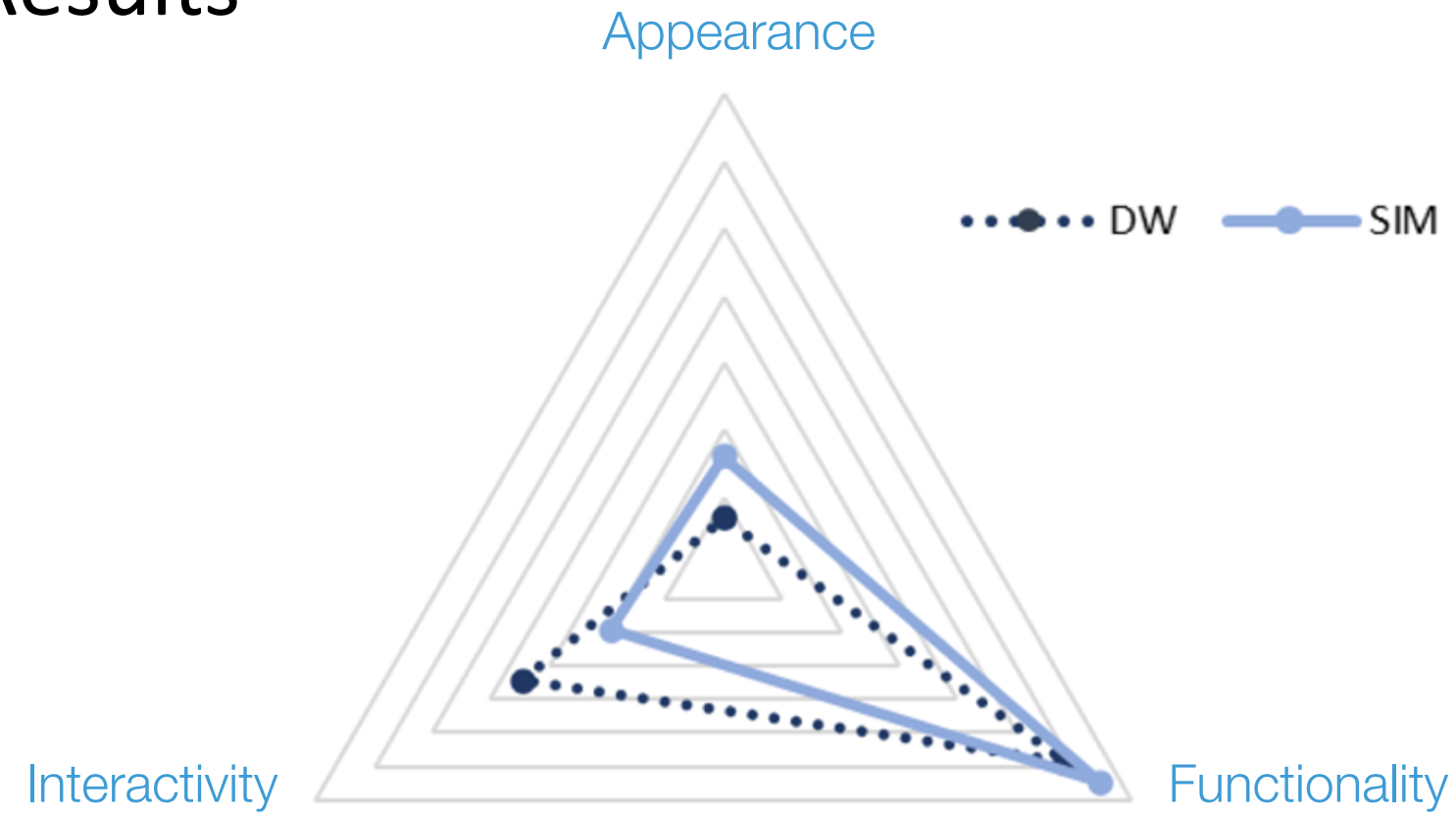
Data Analysis

- Selective verbatim transcription of AV-recordings
- Thematic analysis

Results


Customer perspective
Societal perspective
Restaurant perspective
Technology perspective
DW
SIM

Results



Results

- The computer simulation:
  - Societal perspective
  - Multiple stakeholder's perspectives
- The desktop walkthrough:
  - Stakeholder perspectives
  - The technology in more detail, including ergonomics and accessibility.

Hybrid Prototyping + Simulation

- Useful for society-in-the-loop design and communication on how and where drones may fly and where possible delivery points should be located.
- Not useful for discussions on details of ergonomics and interaction between stakeholders and between stakeholders and the drones.
- Therefore, the simulation worked best with complementary prototypes.

Simulation for Society-in-the Loop Design

- **Broadened the perspective** to non-users of the service.
- **Counterweight** to focusing on the service encounters and the service users.
- **A shared visual reference** for dynamic aspects, like movement and speed, that might be hard to collectively imagine

Potential Future Research on a Hybrid Prototyping+Simulation Approach

Playing with Tensions

a. With varied base of **stakeholders**
b. With people with **experiences** of the place
c. Visualize particular **values**
d. Vary the **kinds of services**

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