



VR NUTZERSTUDIEN

in der Architekturausbildung

Vertr.-Prof. Dr. Sven Schneider
Lehrstuhl Informatik in der Architektur

CHALLENGE FOR DESIGN

Anticipating user behavior



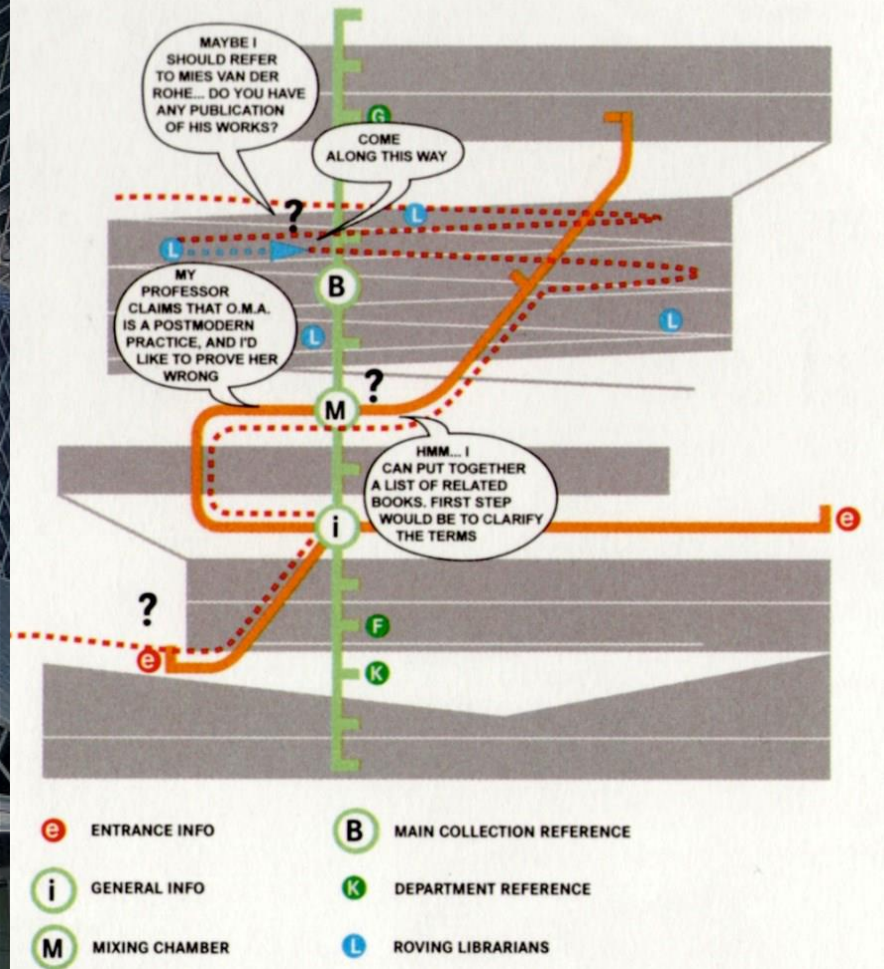
Seattle Public Library (OMA, 2004)

Von Bobak Ha'Eri, CC BY 3.0,

<https://commons.wikimedia.org/w/index.php?curid=7094655>

Reference strategy

Scenario 3: Specific study reference



One of OMA's Reference Strategy Scenarios

CHALLENGE FOR DESIGN

Anticipating user behavior

"I ... left the building as soon as I could figure out how to get out, hoping I wouldn't have an anxiety attack first"

"It's basically a cold labyrinth ... I can't get past the lack of functionality"

"The lack of accessibility is bewildering"

"I'm still not sure how I would get out if there was ever a fire, even after visiting weekly for almost two years"

Comments of users about the Seattle Public Library

Image and comments taken from Carlson et al. (2010) „Getting lost in buildings“

CHALLENGE FOR DESIGN

Anticipating user behavior



Lobby of the University Library, Weimar

own picture

CHALLENGE FOR DESIGN

Anticipating user behavior



Bauhaus Museum Weimar

Bilder: Claus Bach

https://www.baunetz.de/meldungen/Meldungen-Bauhaus-Museum_von_Heike_Hanada_eroeffnet_6459291.html

GOAL

Educating for User Centered Architectural Design

“(...) psychologische Erfahrungen bezüglich Form, Raum, Farbe (...) stellen ebenso reale Probleme wie die des Materials, der Konstruktion, der Wirtschaftlichkeit [dar], ja, ich möchte sogar den psychologischen Problemen der Gestaltung, da sie grundlegend sind, den Vorrang geben (...)“

„(...) vage Ausdrücke wie ‘die Atmosphäre eines Gebäudes’ oder ‘die Gemütlichkeit eines Raumes’ sollten präzisiert werden.“

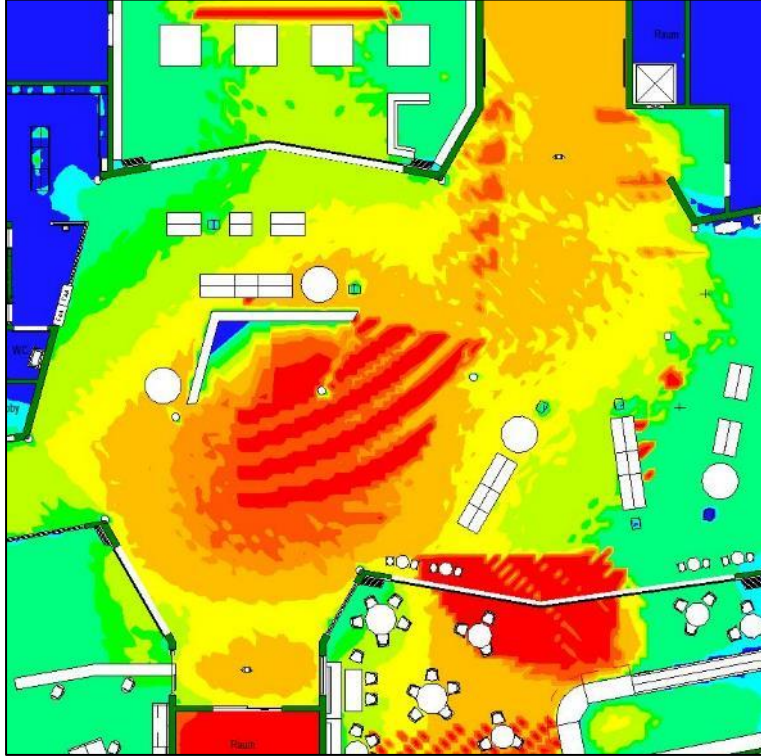
Walter Gropius

The scope of total architecture, 1956, p. 30, 32

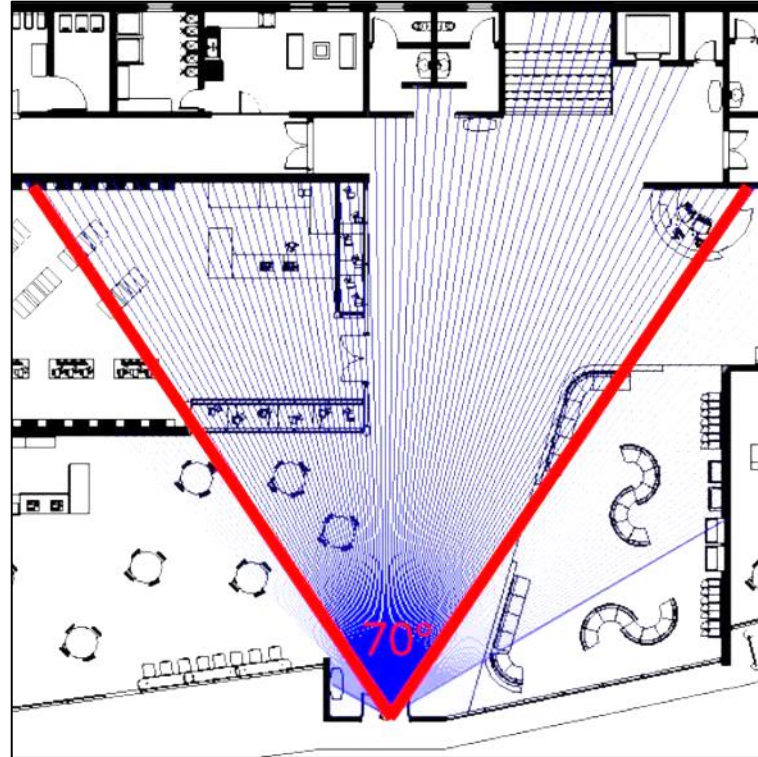


DIGITAL TOOLS

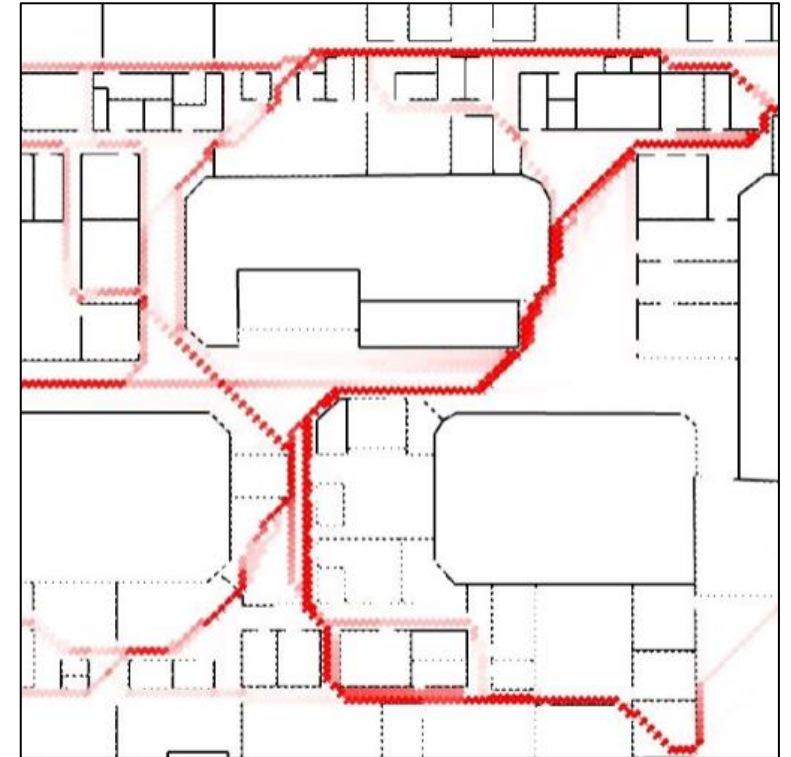
Simulation of behaviorally & emotionally relevant features of buildings



Daylight



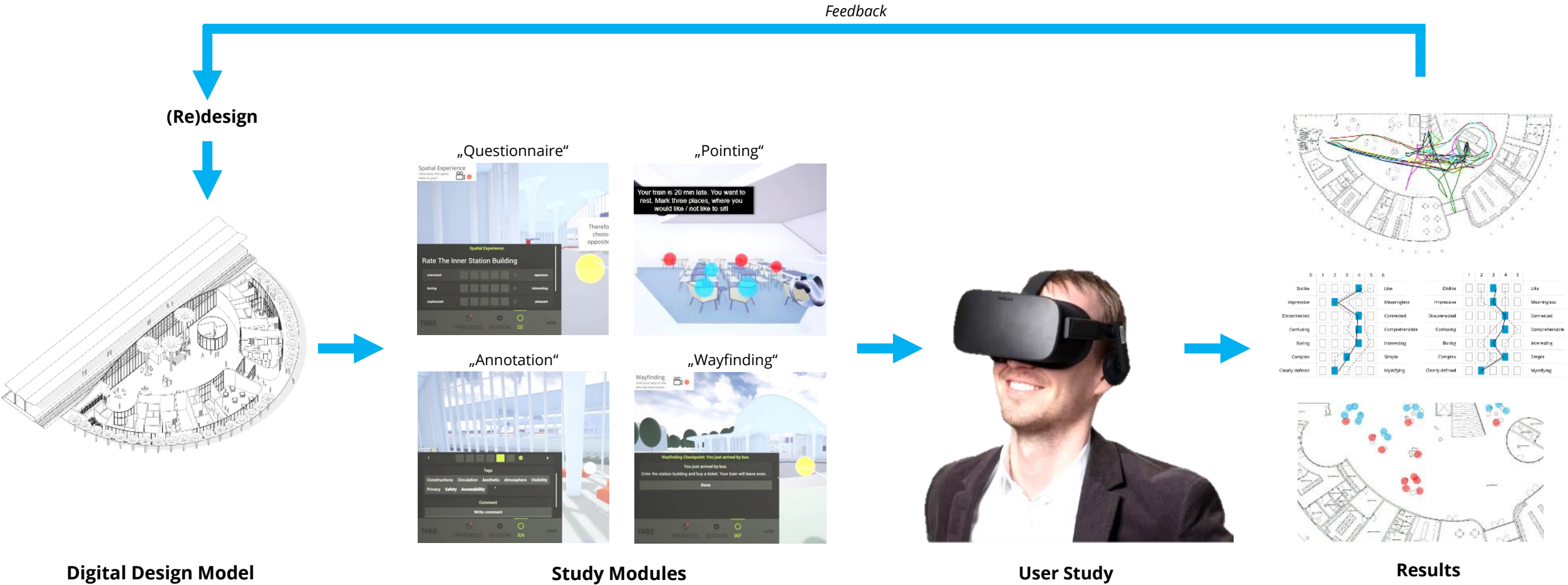
Visibility

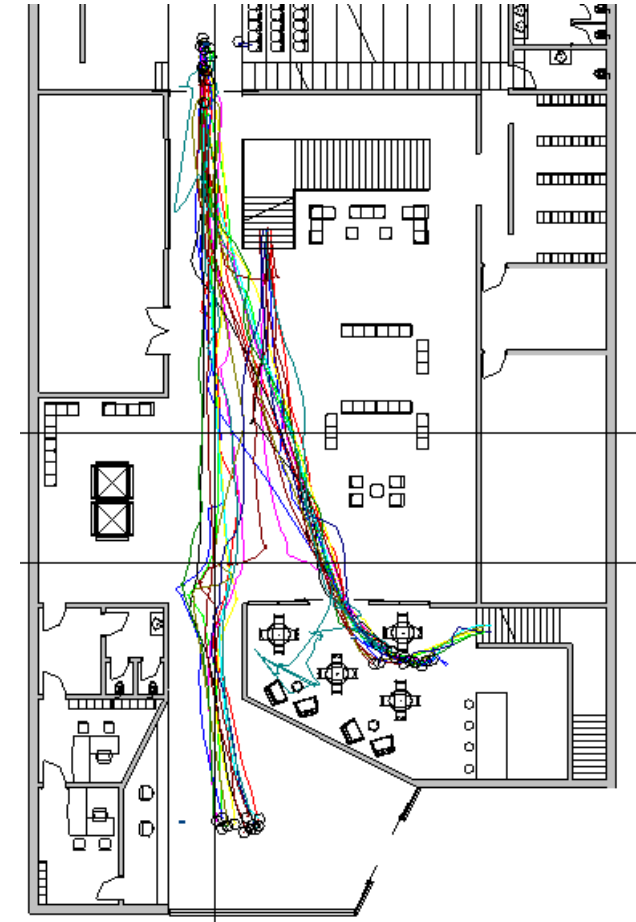
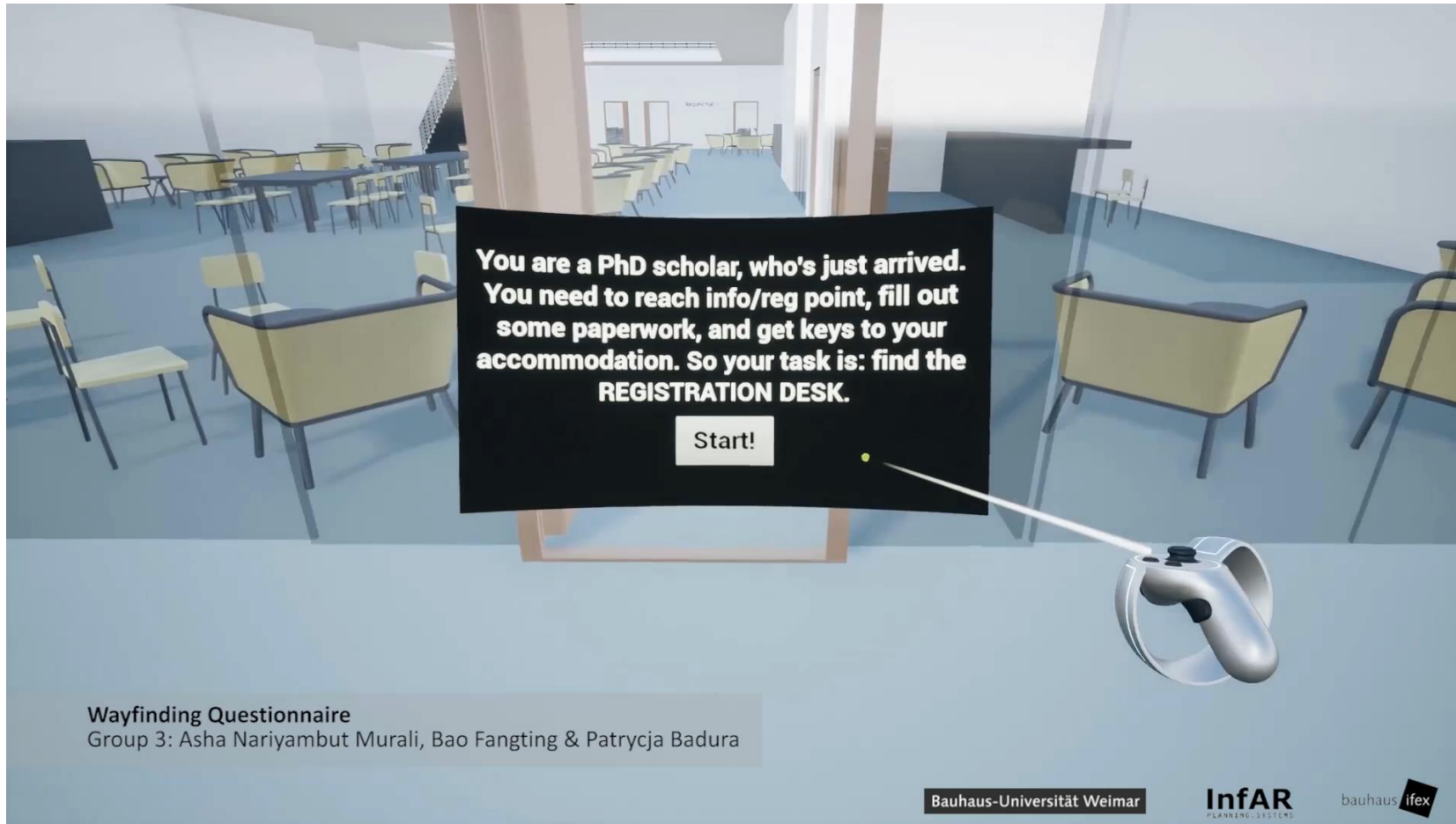


Accessibility

DIGITAL TOOLS

Virtual Reality Based User Studies for Design Evaluation (VREVAL)





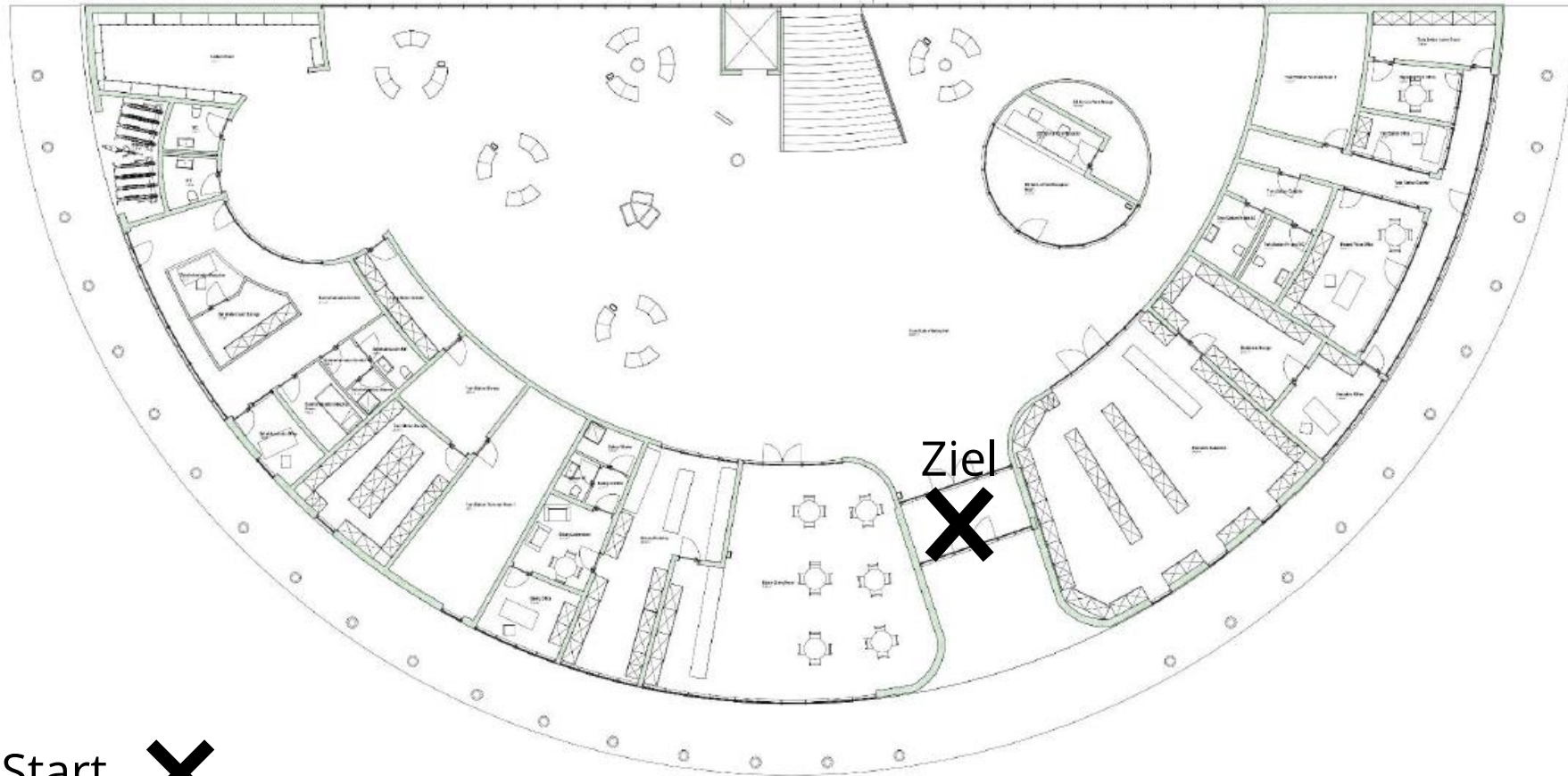
Wayfinding tasks in a virtual environment

Students: Patrycja Badura, Bao Fangting, Asha Nariyambut Murali

Result Visualisation in CAD-Software

STUDENT EXAMPLE

Testing the Ease of Finding the Entrance

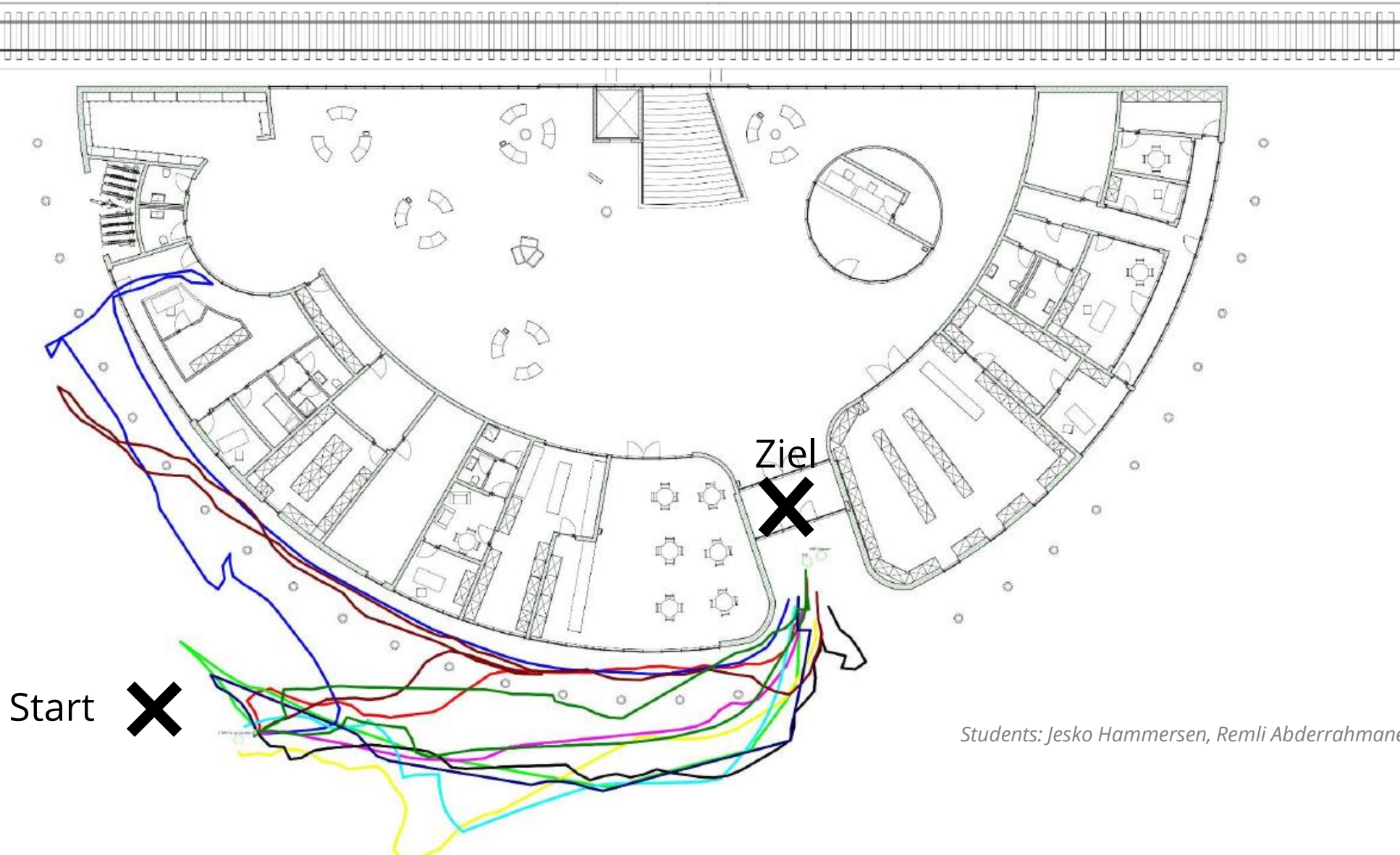


Start X

Students: Jesko Hammersen, Remli Abderrahmane, Daniel Benthaus, Nikita Pfeifer

STUDENT EXAMPLE

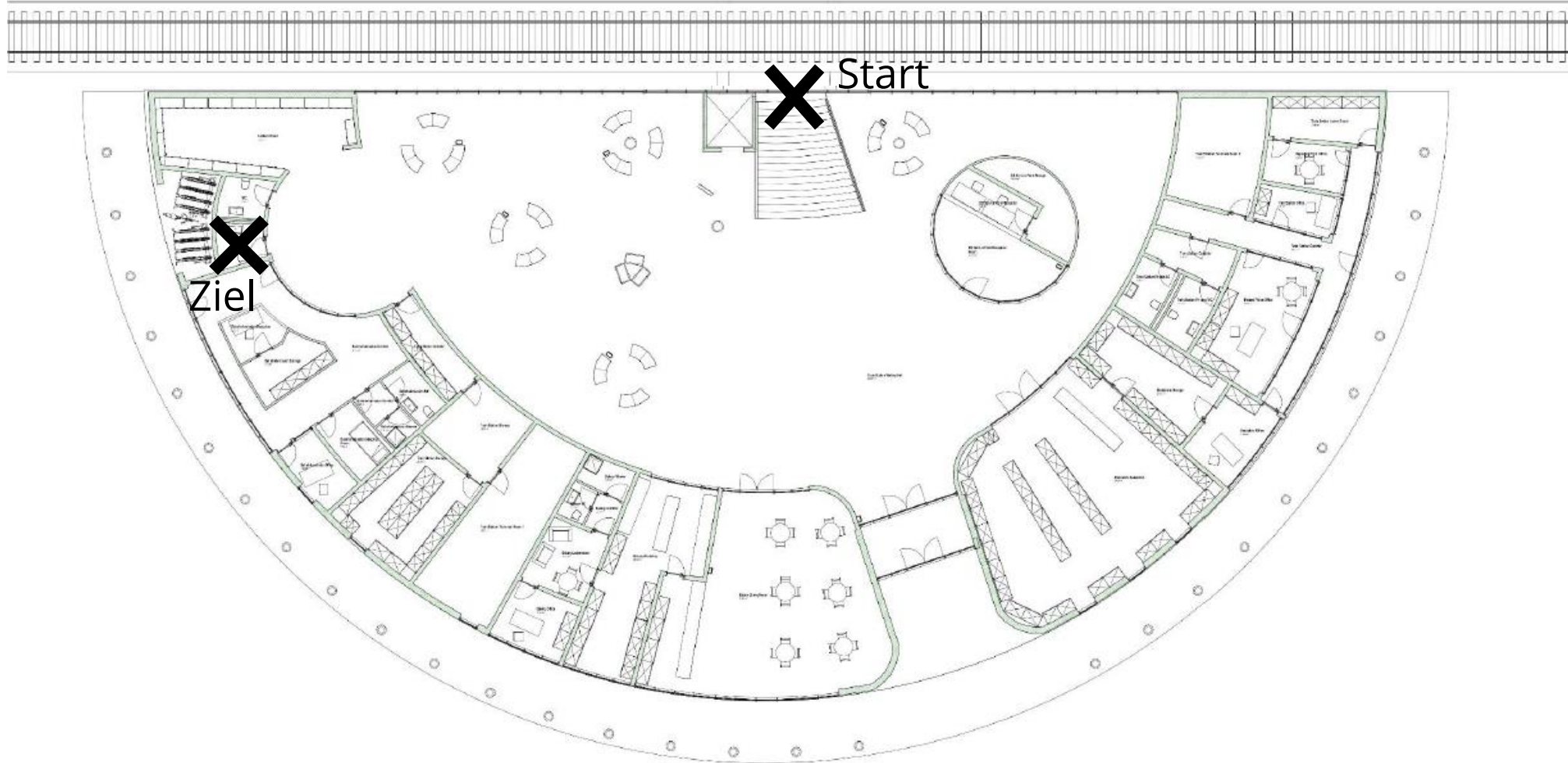
Testing the Ease of Finding the Entrance



Students: Jesko Hammersen, Remli Abderrahmane, Daniel Benthaus, Nikita Pfeifer

STUDENT EXAMPLE

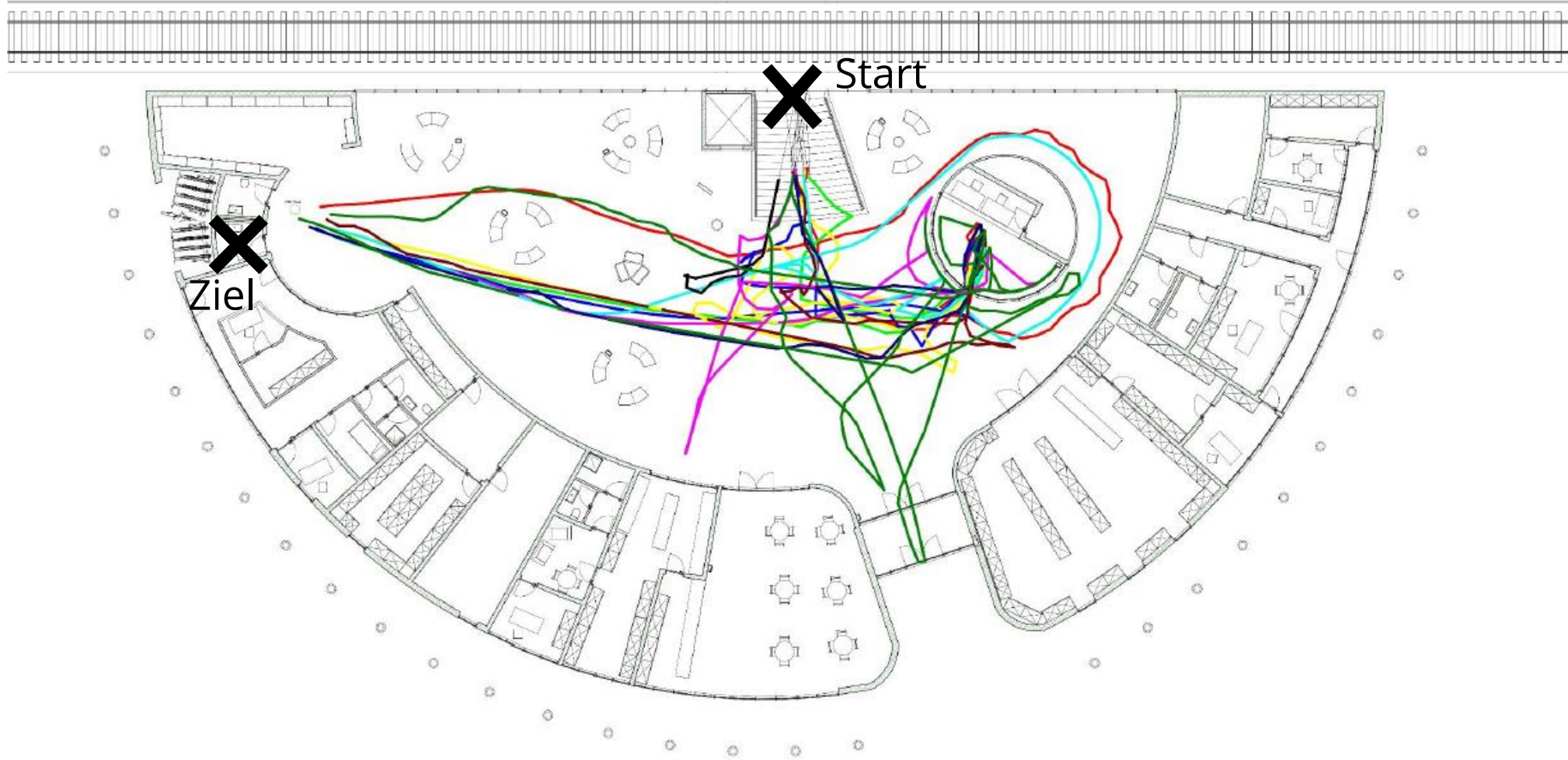
Testing the Ease of Finding the Toilets



Students: Jesko Hammersen, Remli Abderrahmane, Daniel Benthaus, Nikita Pfeifer

STUDENT EXAMPLE

Testing the Ease of Finding the Toilets



Students: Jesko Hammersen, Remli Abderrahmane, Daniel Benthaus, Nikita Pfeifer

COURSE SCHEDULE

Seminar on Building Information Modeling

Seminar on User Centered Design Evaluation (Daylight, Visibility, Accessibility, VR-based User Studies)

Warm Up

(Field Trip, Literature Review, VR-Experience)

2 weeks

Design Concept

(Familiarize with the programme, deciding about location of spaces, shape of the building)

~ 3 weeks

User Study Preparation

(selecting Key Aspects of the design concept, develop a method for investigating these aspects with respect to user behavior / experience)

~ 7 weeks

User Study

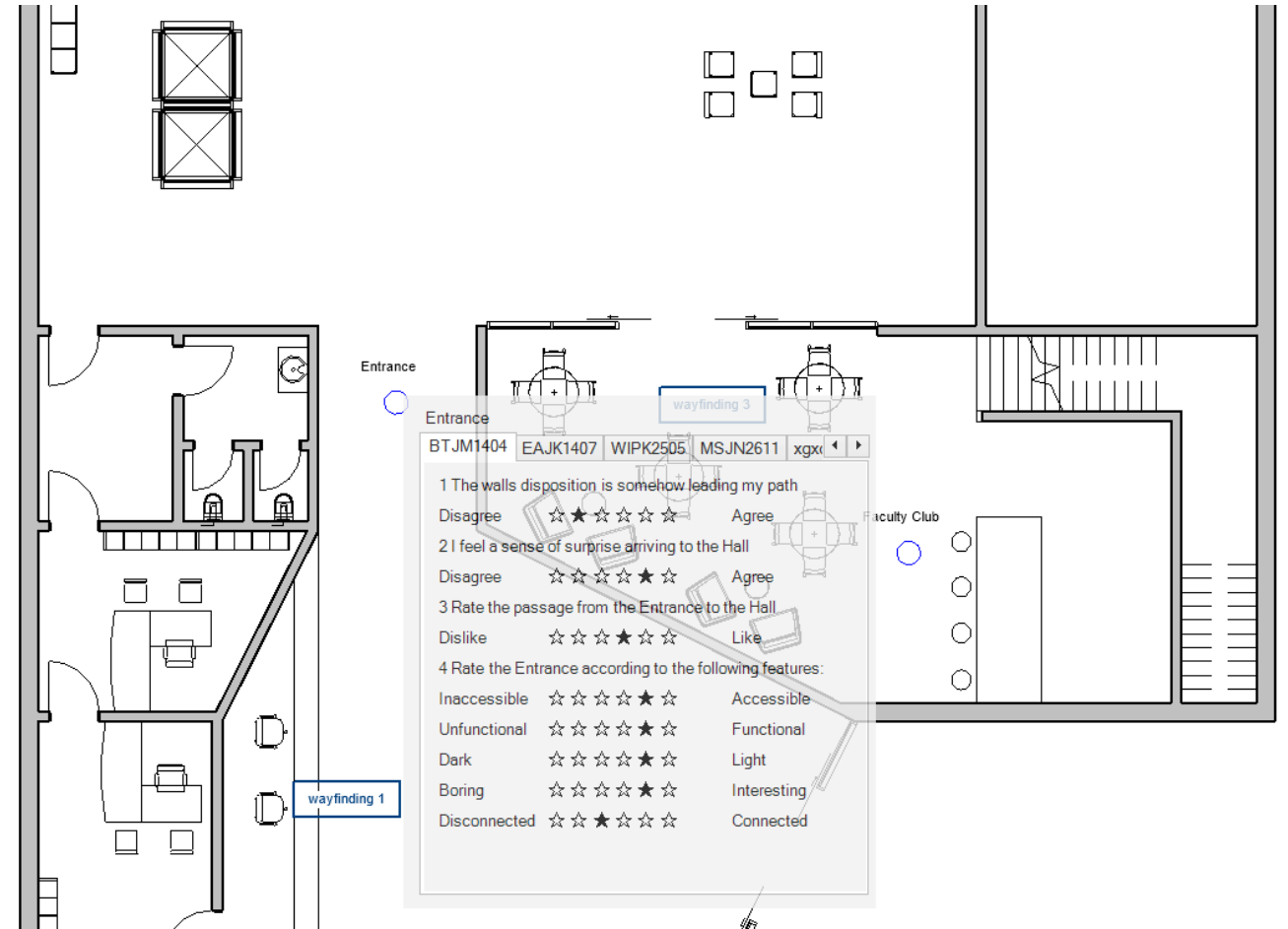
(conducting the study)

Analysis & Presentation

(visualize study result, interpret & draw conclusions)

2 weeks

The result ≠ optimal design, but knowledge and skills to properly evaluate a design!



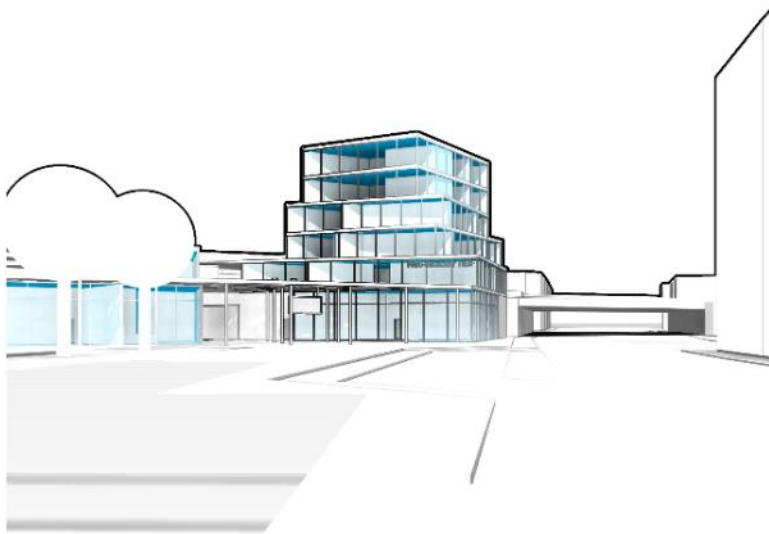
Questionnaire inside the Virtual Environment

Students: Carlotta Di Iesu, Henry Hadathia, Pablo Silva, Bernardo Villagra

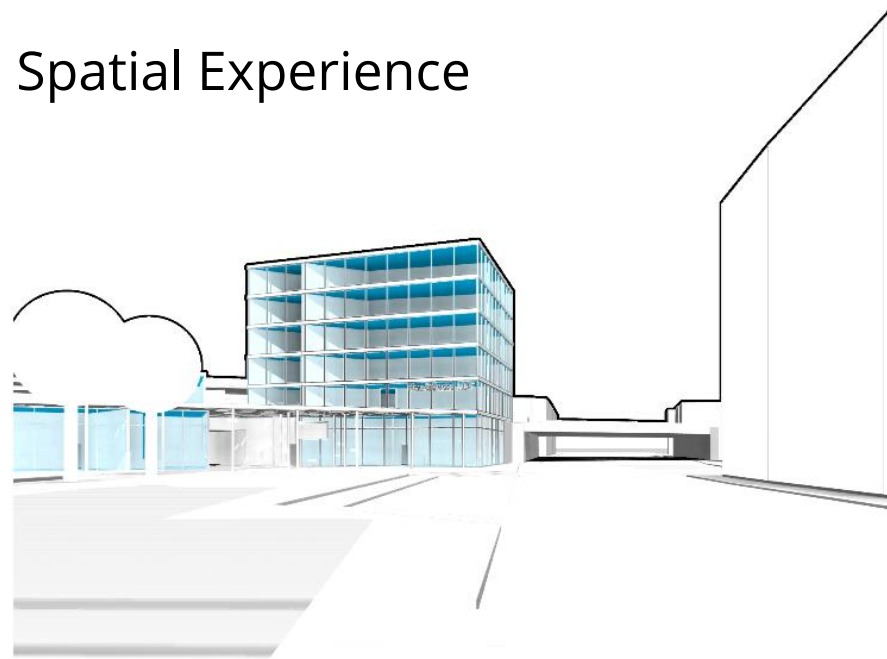
Result Visualisation in CAD-Software

STUDENT EXAMPLE

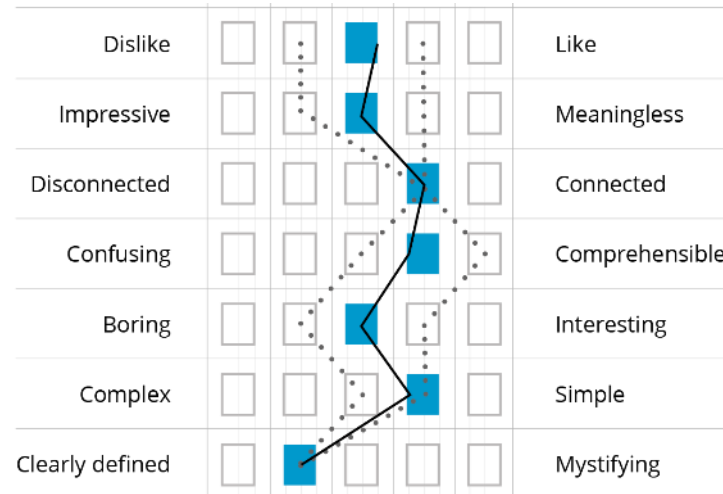
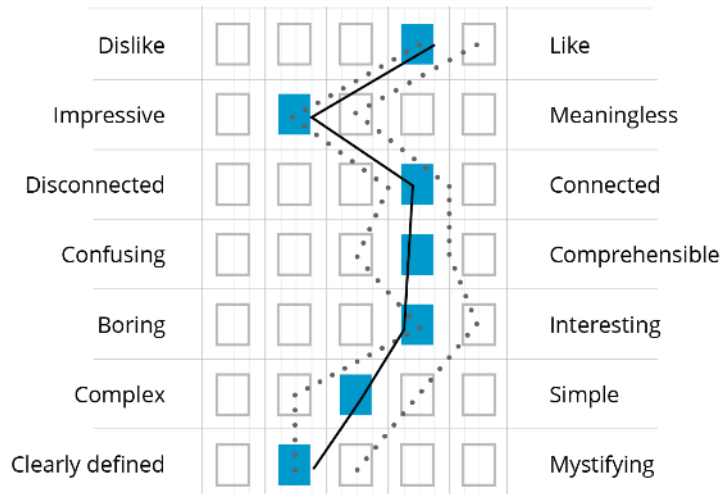
The Effect of Building Shape on Spatial Experience



Variant A



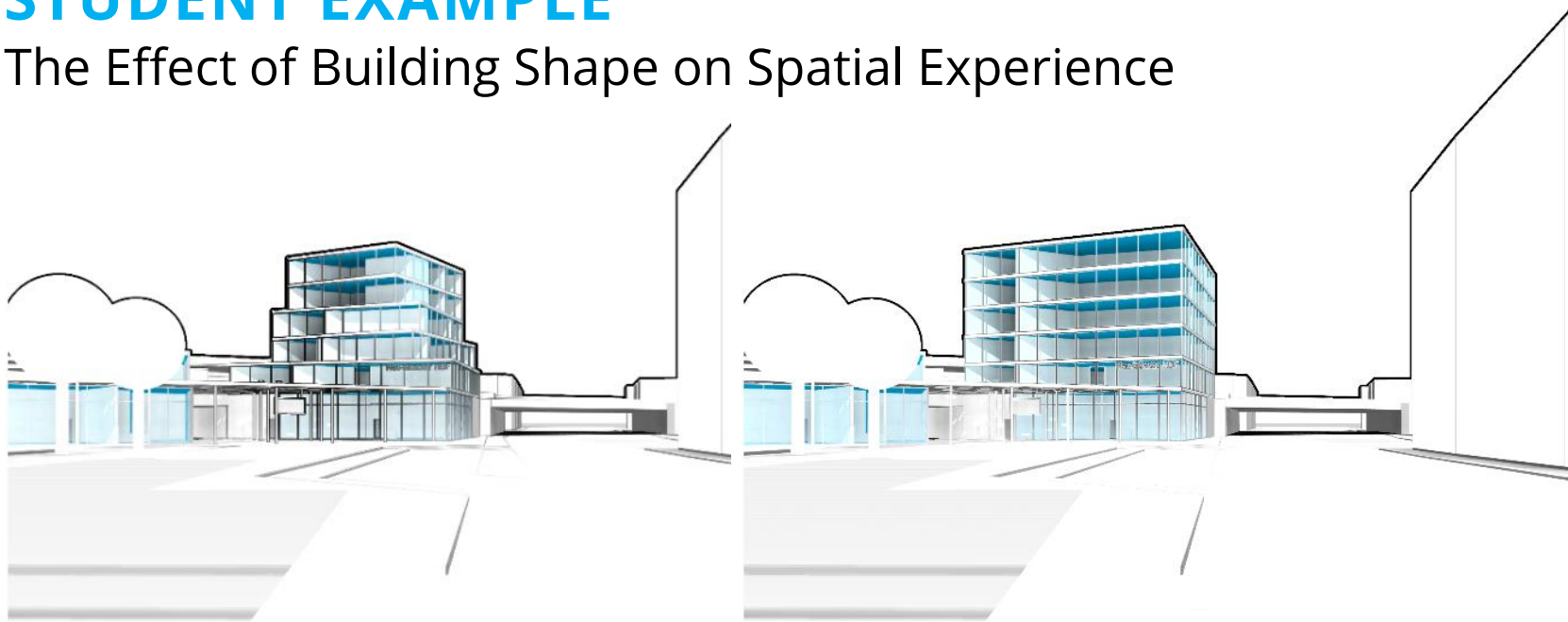
Variant B



Students: Florian Brettner & Xiao Yue-Hu

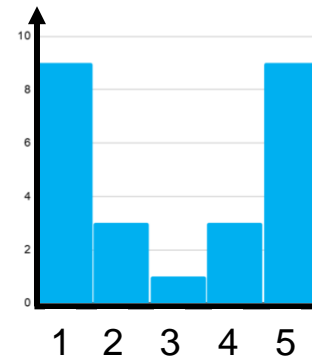
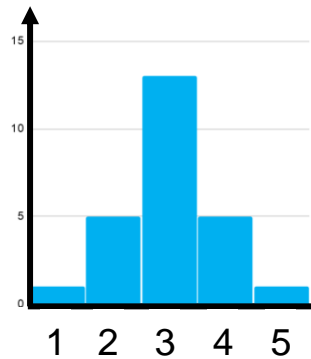
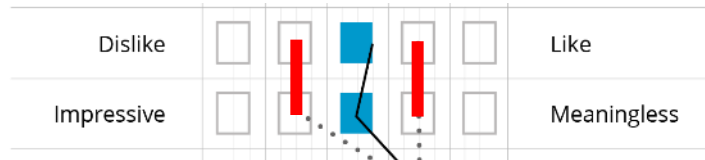
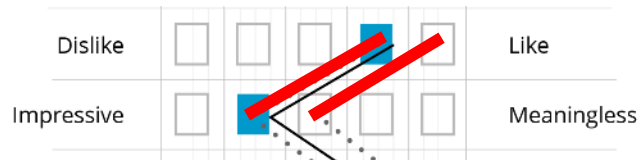
STUDENT EXAMPLE

The Effect of Building Shape on Spatial Experience



Variant A

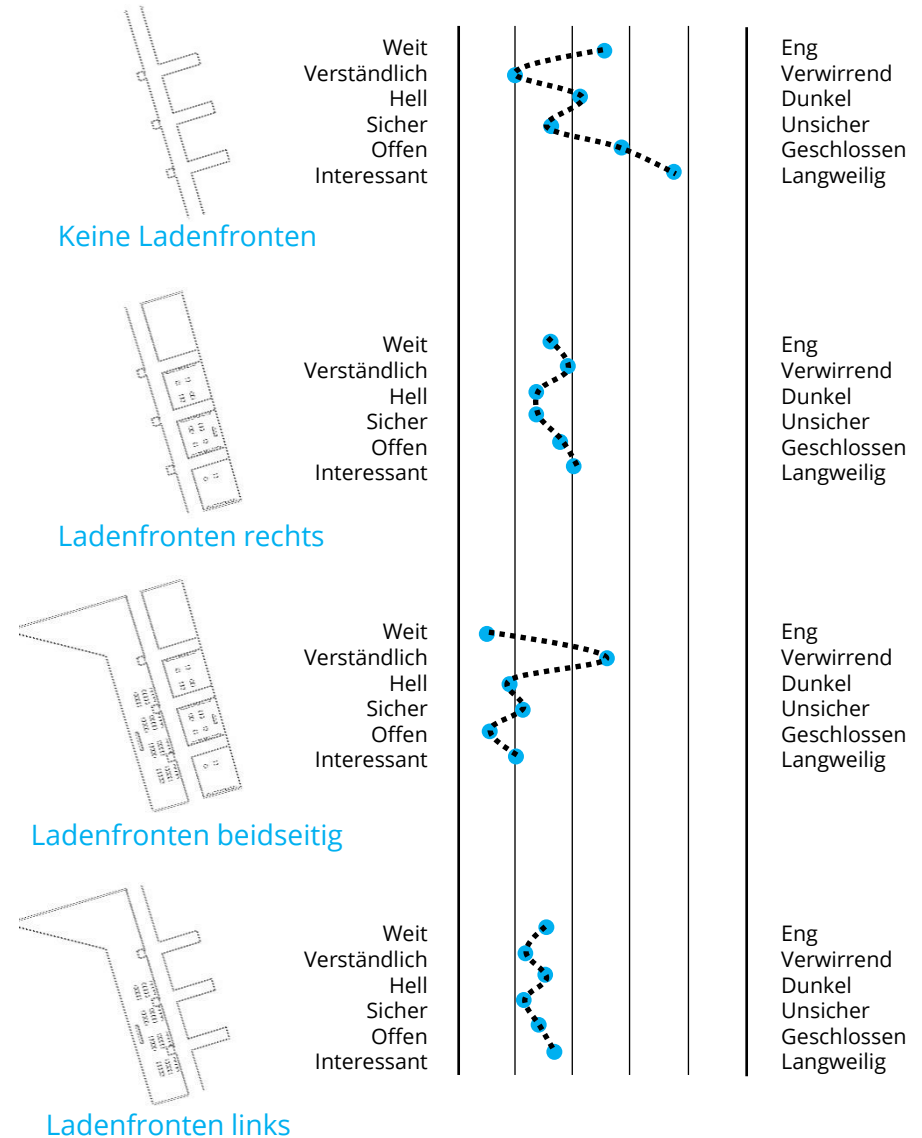
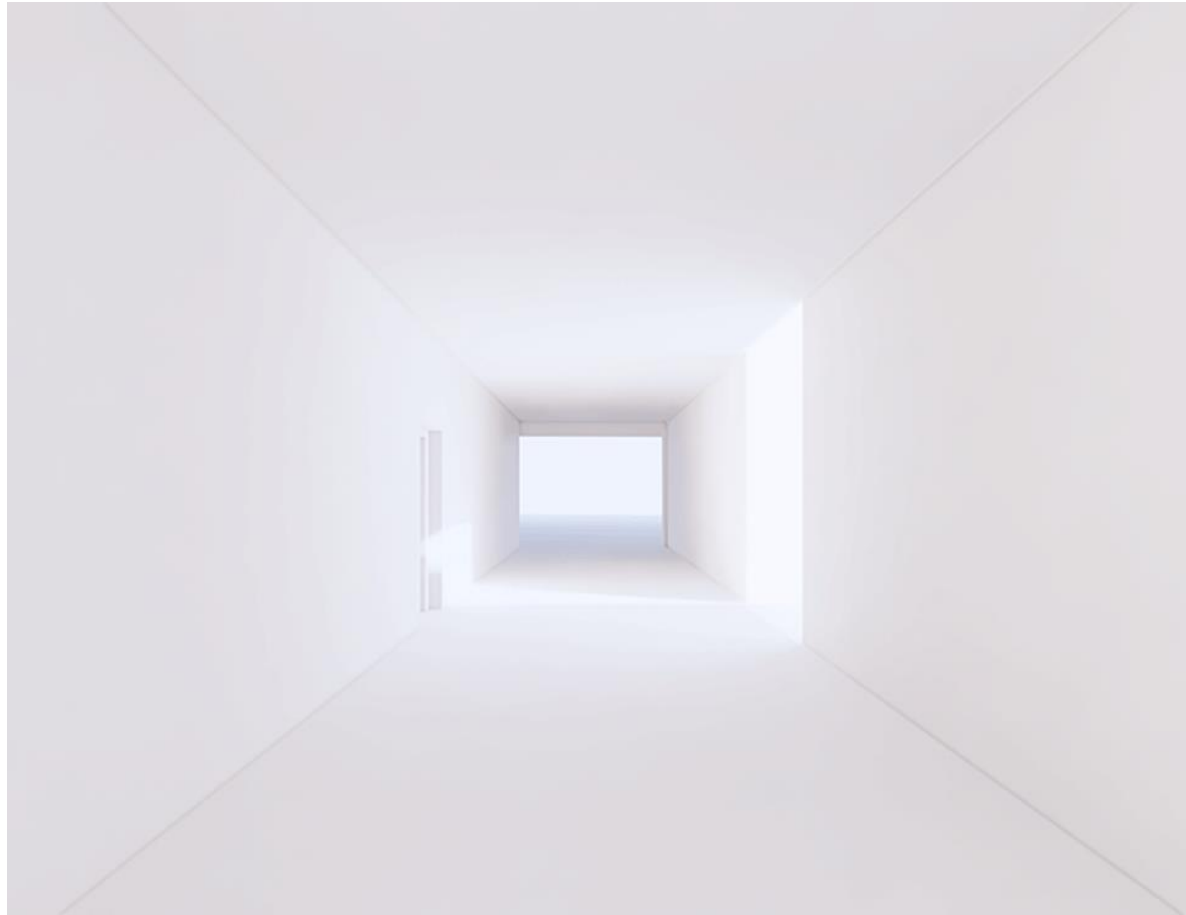
Variant B



Students: Florian Brettner & Xiao Yue-Hu

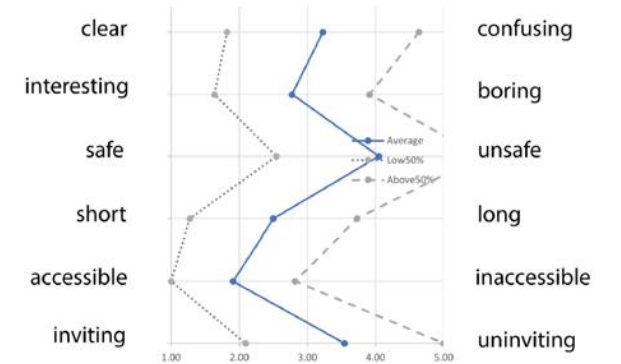
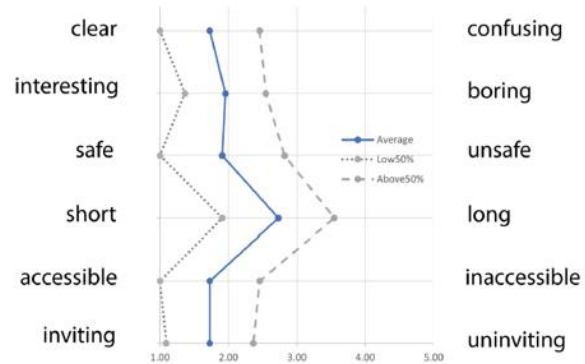
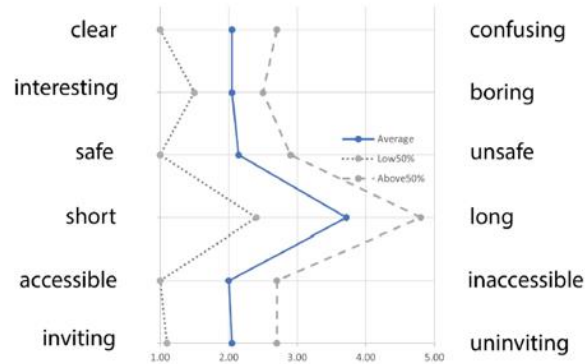
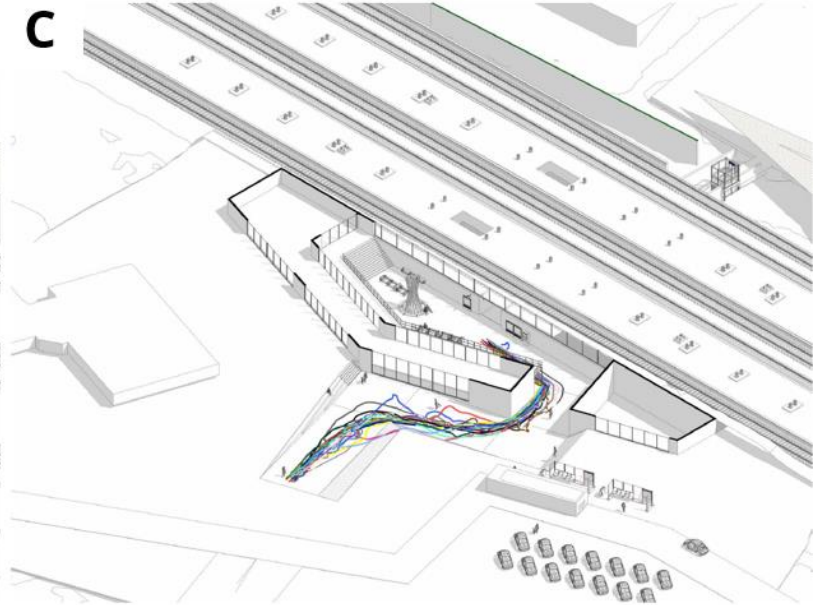
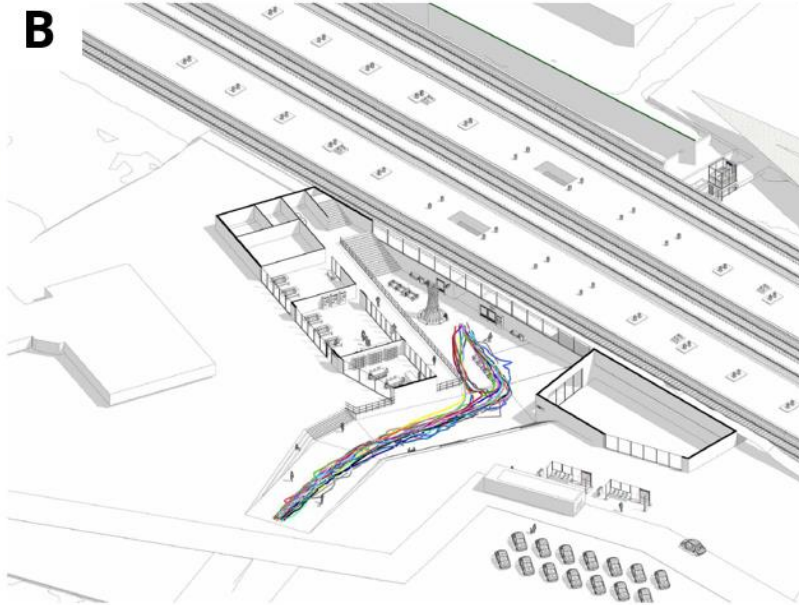
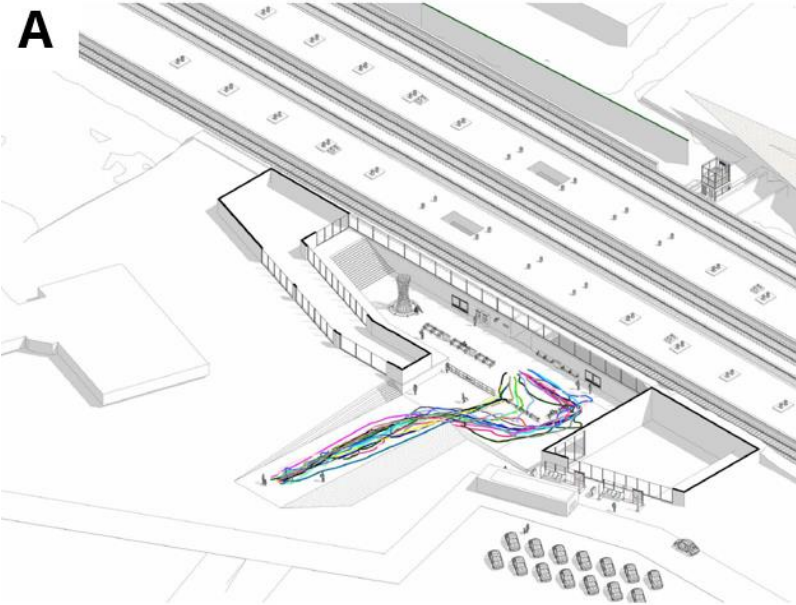
STUDY EXAMPLE

Spatial Experience in a Station Underpass

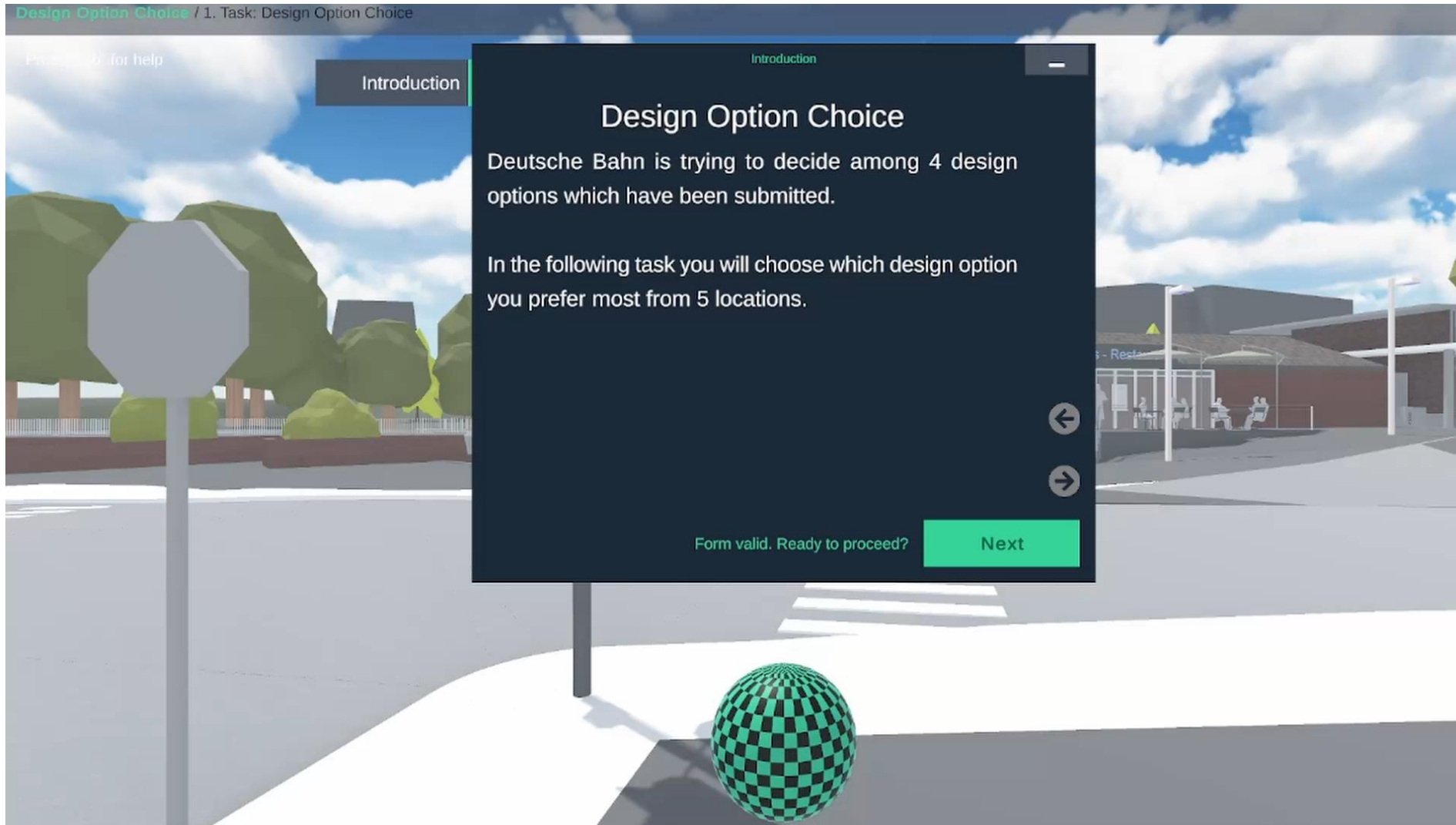


STUDENT EXAMPLE

The Effect of Ramp Geometry on Movement & Spatial Experience



Students: Eda Özaltay, Javier Ignacio Ochoa & Antonia Schlaich

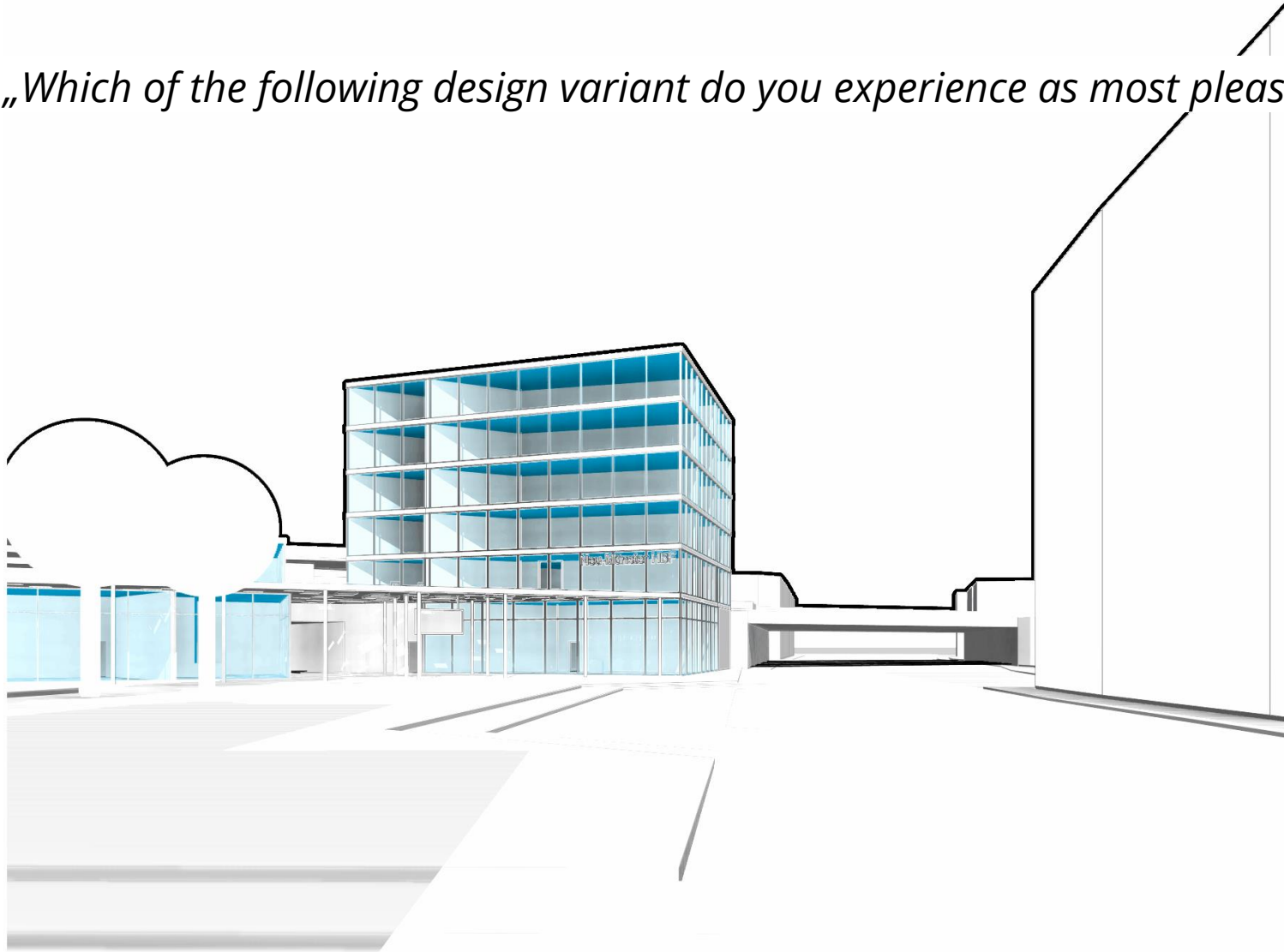


Choice Task in a virtual environment

STUDENT EXAMPLE

Which Building Height is perceived as most pleasant?

„Which of the following design variant do you experience as most pleasant?“

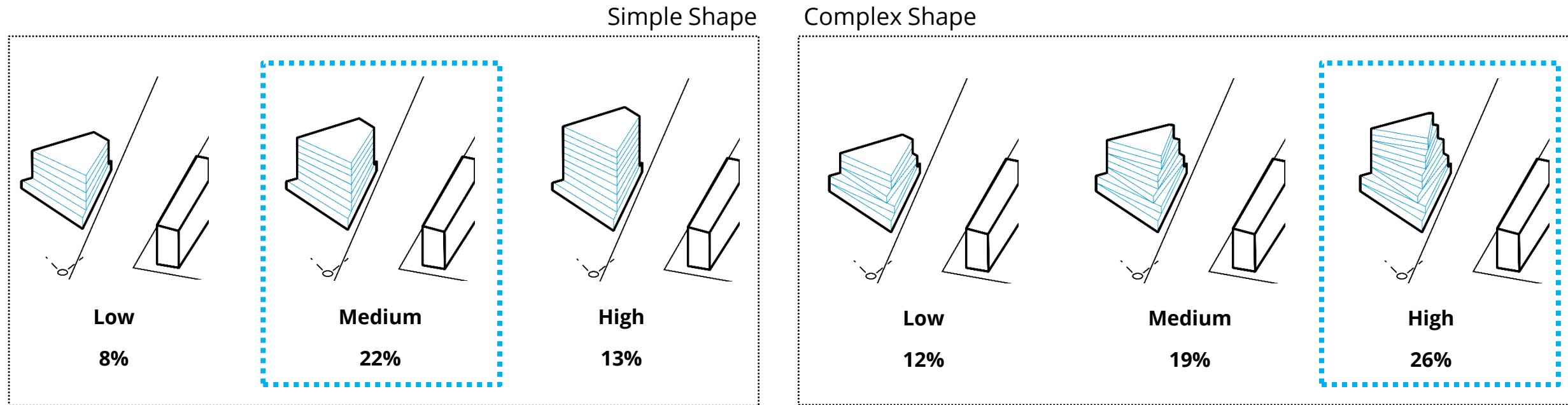


Students: Florian Brettner & Xiao Yue-Hu

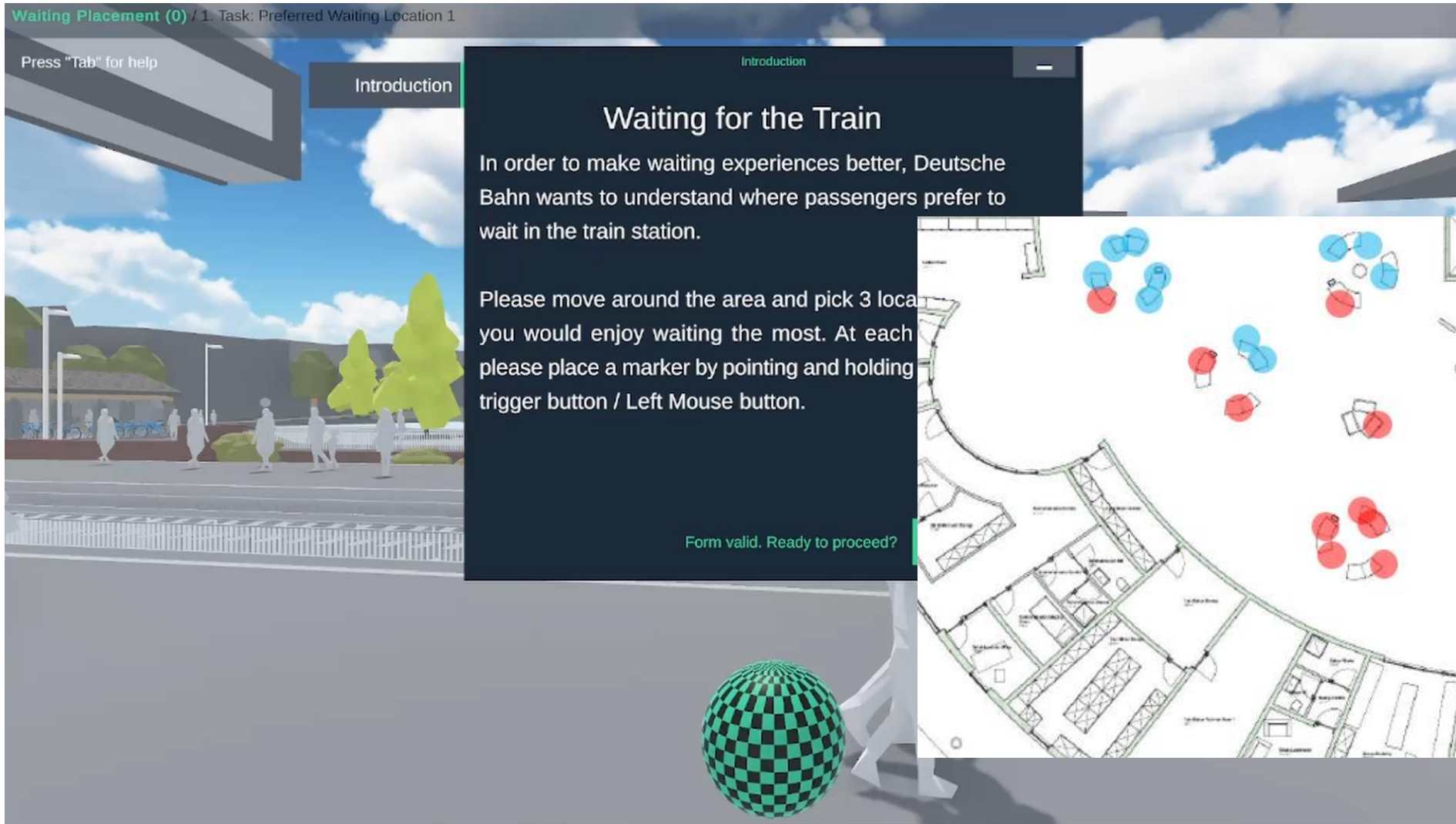
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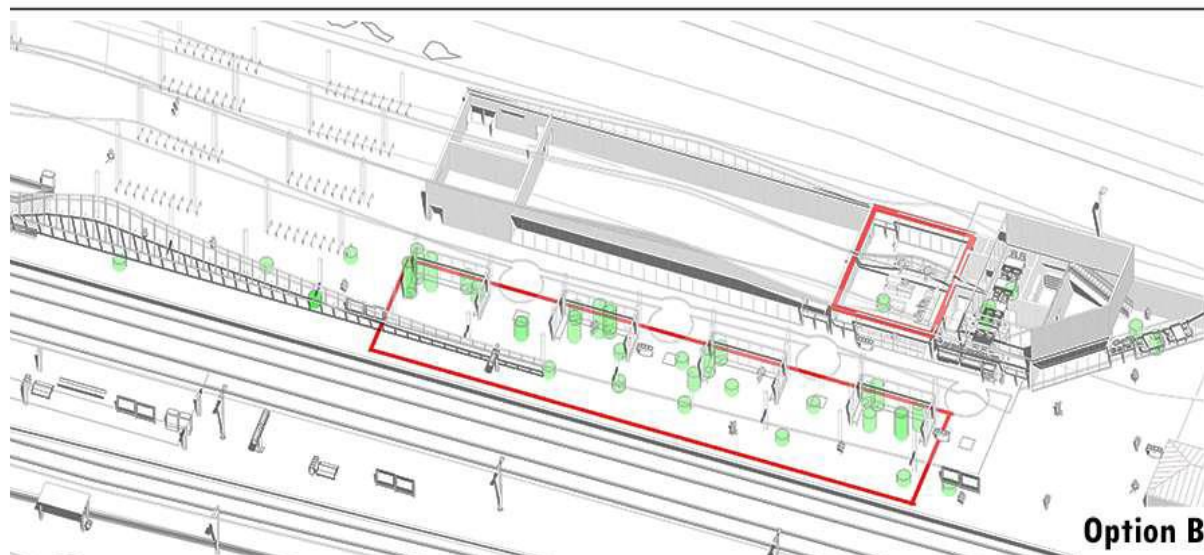
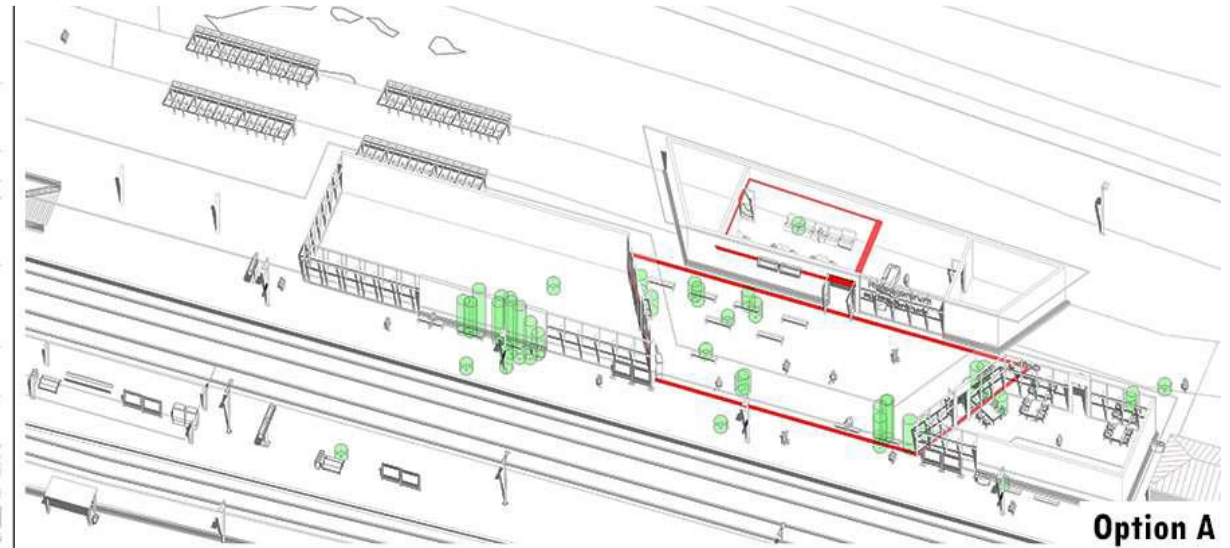
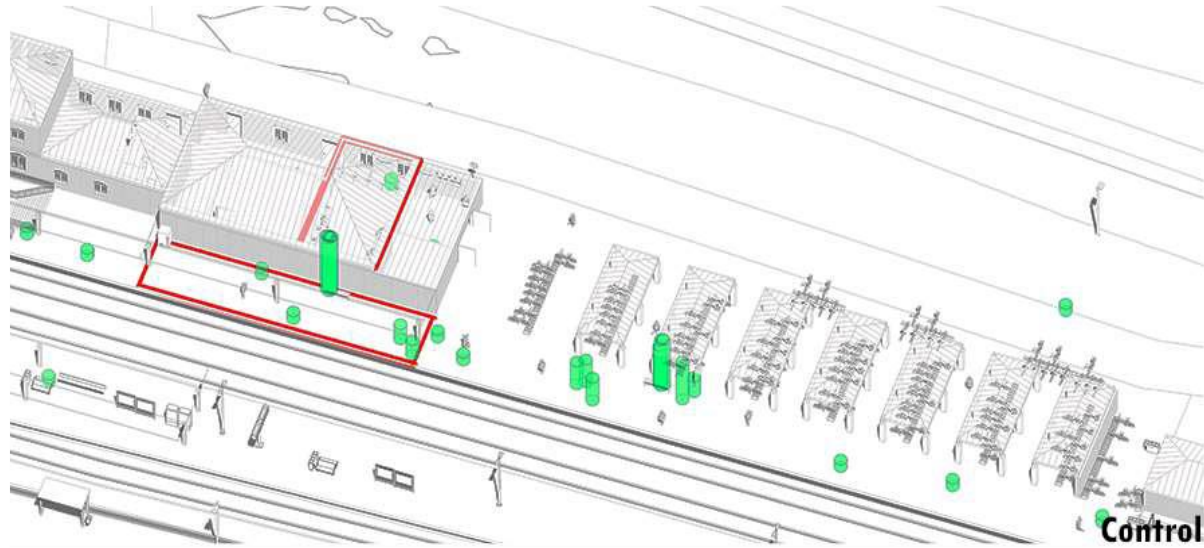


Result Visualisation

Pointing tasks in a virtual environment

STUDENT EXAMPLE

Do People sit in „designated“ waiting areas?



STUDENT EXAMPLE

Seating Preferences in two station forecourt variants



Students: Elisa Vasiliu, Sara Fabbri & Andrew McCluskie

STUDENT EXAMPLE

Seating Preferences for new Furniture for Weimar Train Station

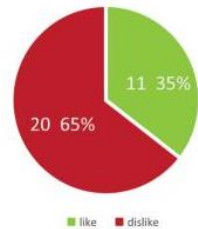
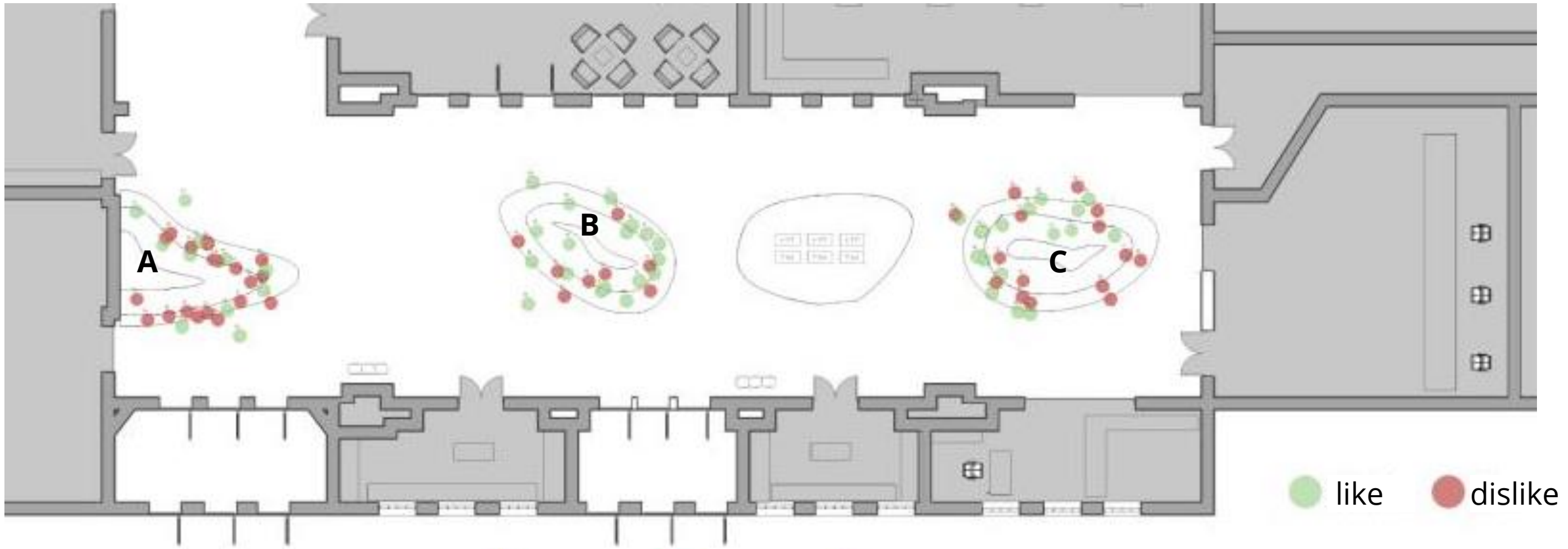


Entwurf für die Umgestaltung der Wartehalle des Weimarer Bahnhofs

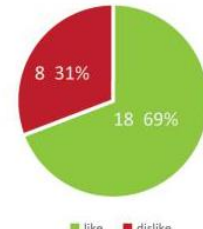
Master Thesis, Fanging Bao

STUDENT EXAMPLE

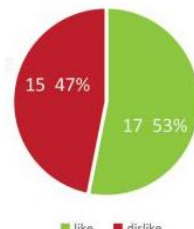
Seating Preferences for new Furniture for Weimar Train Station



A



B



C

● like ● dislike

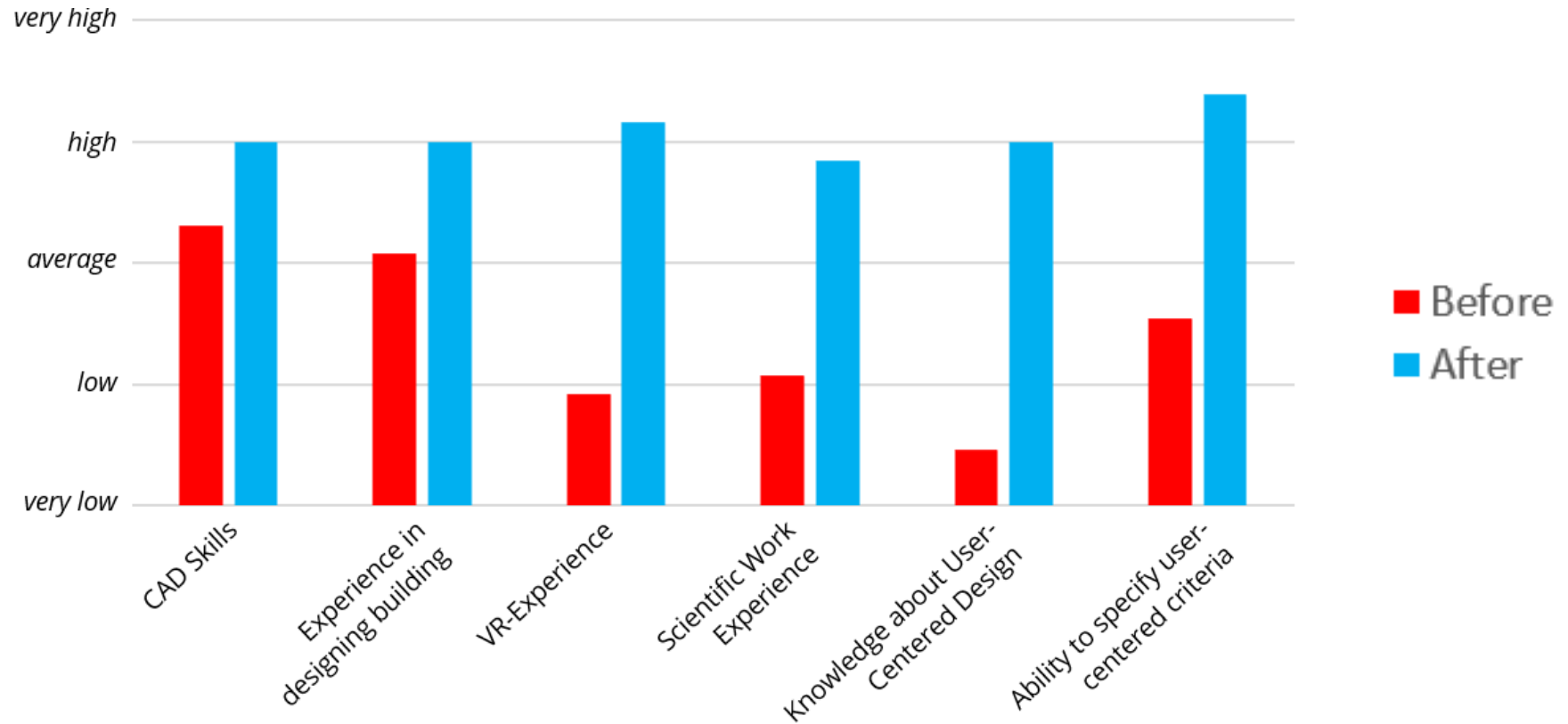
Ergebnisse der Sitzpräferenzstudie

Master Thesis, Fanging Bao

EVALUATION

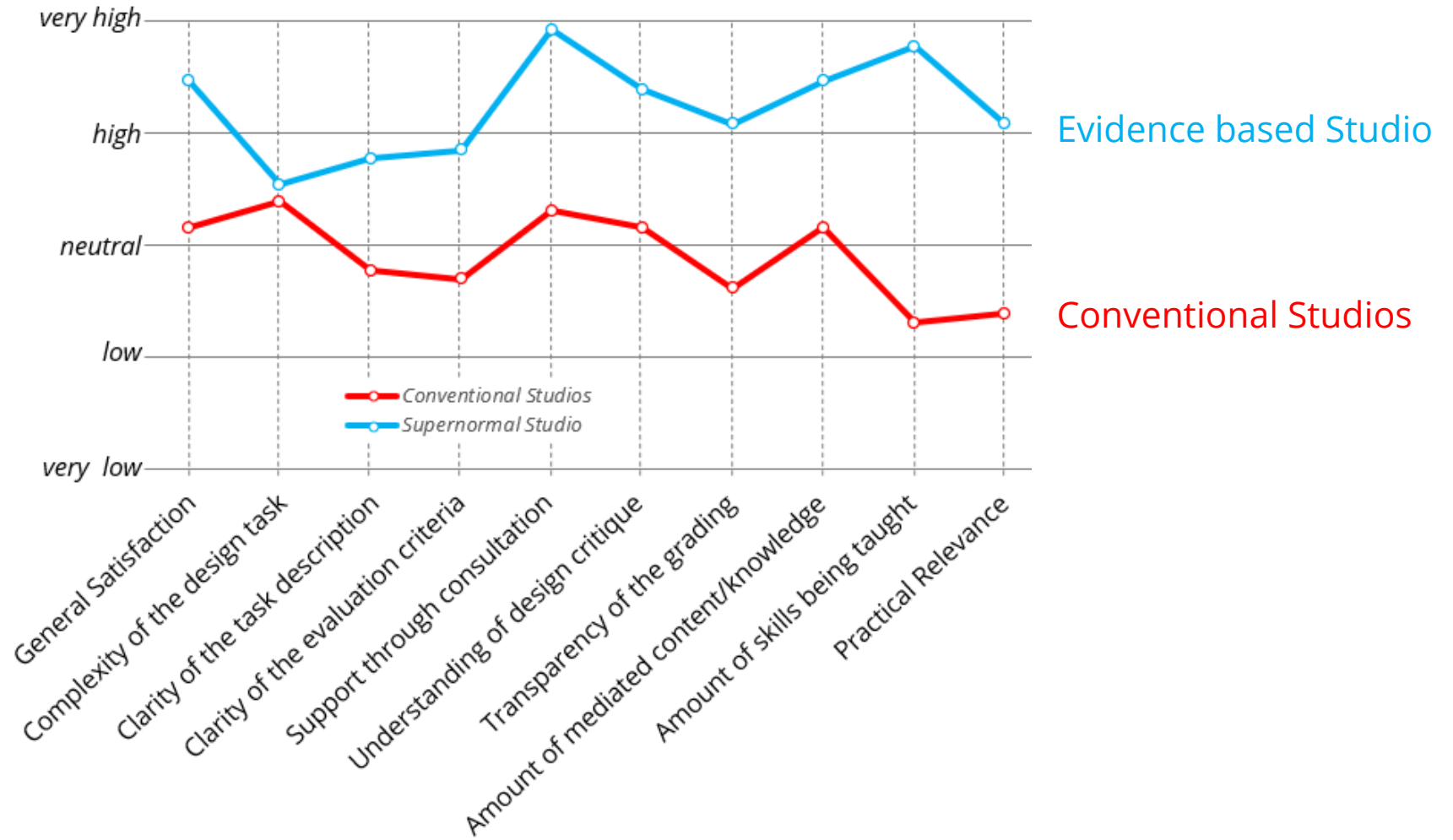
Skills & Knowledge Transfer

„Please rate your Skills / Knowledge in the following aspects!“



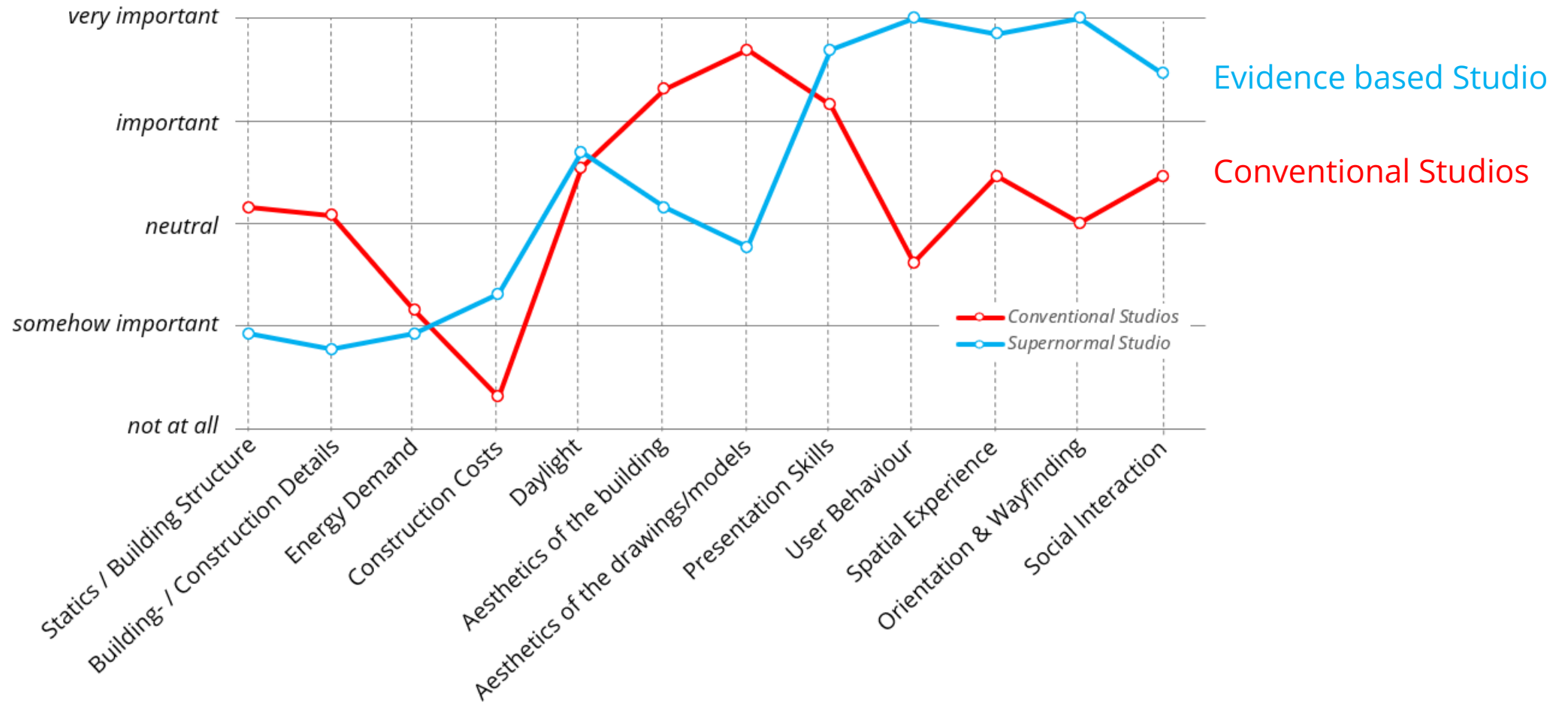
EVALUATION

Comparison to Conventional Architectural Studios



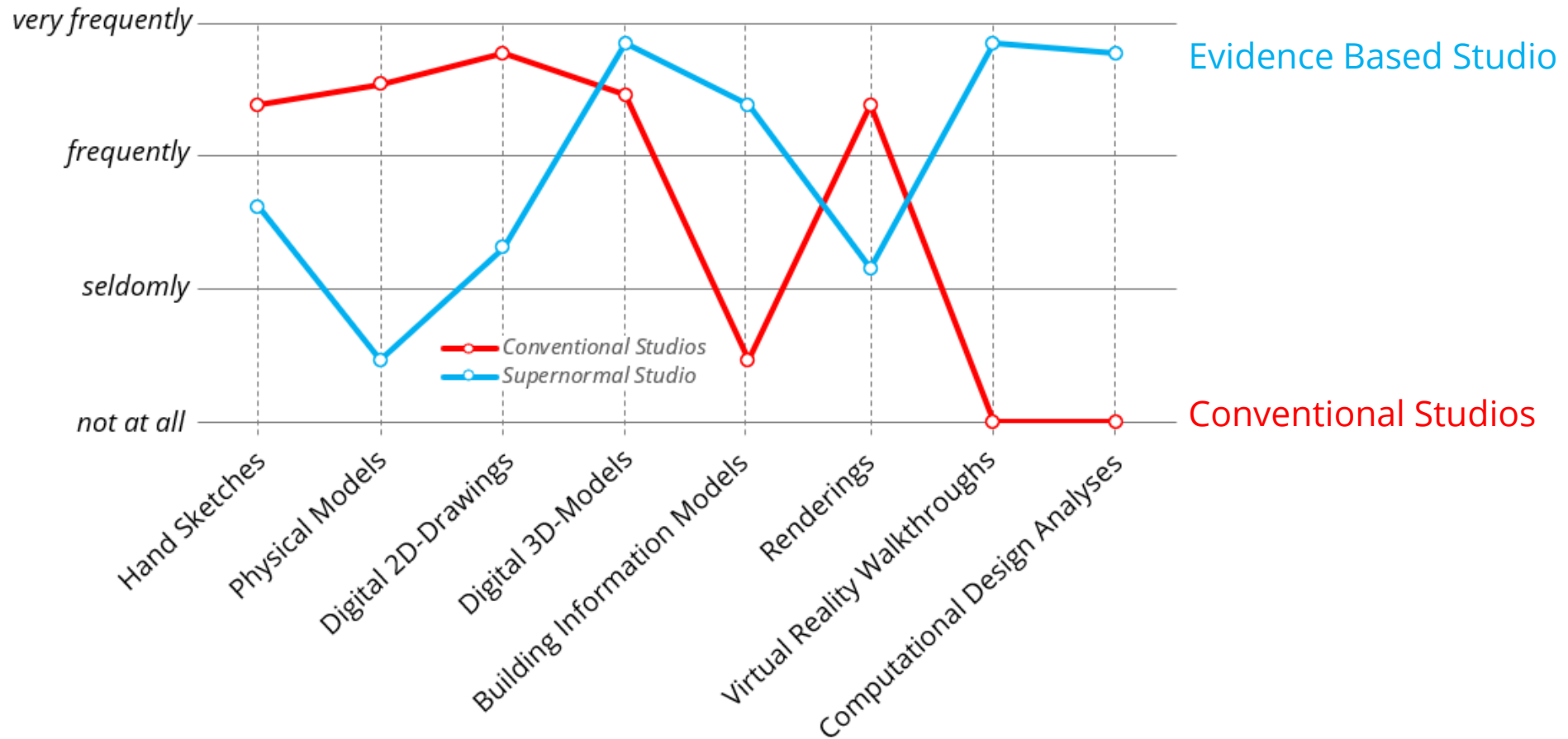
EVALUATION

Comparison to Conventional Architectural Studios



EVALUATION

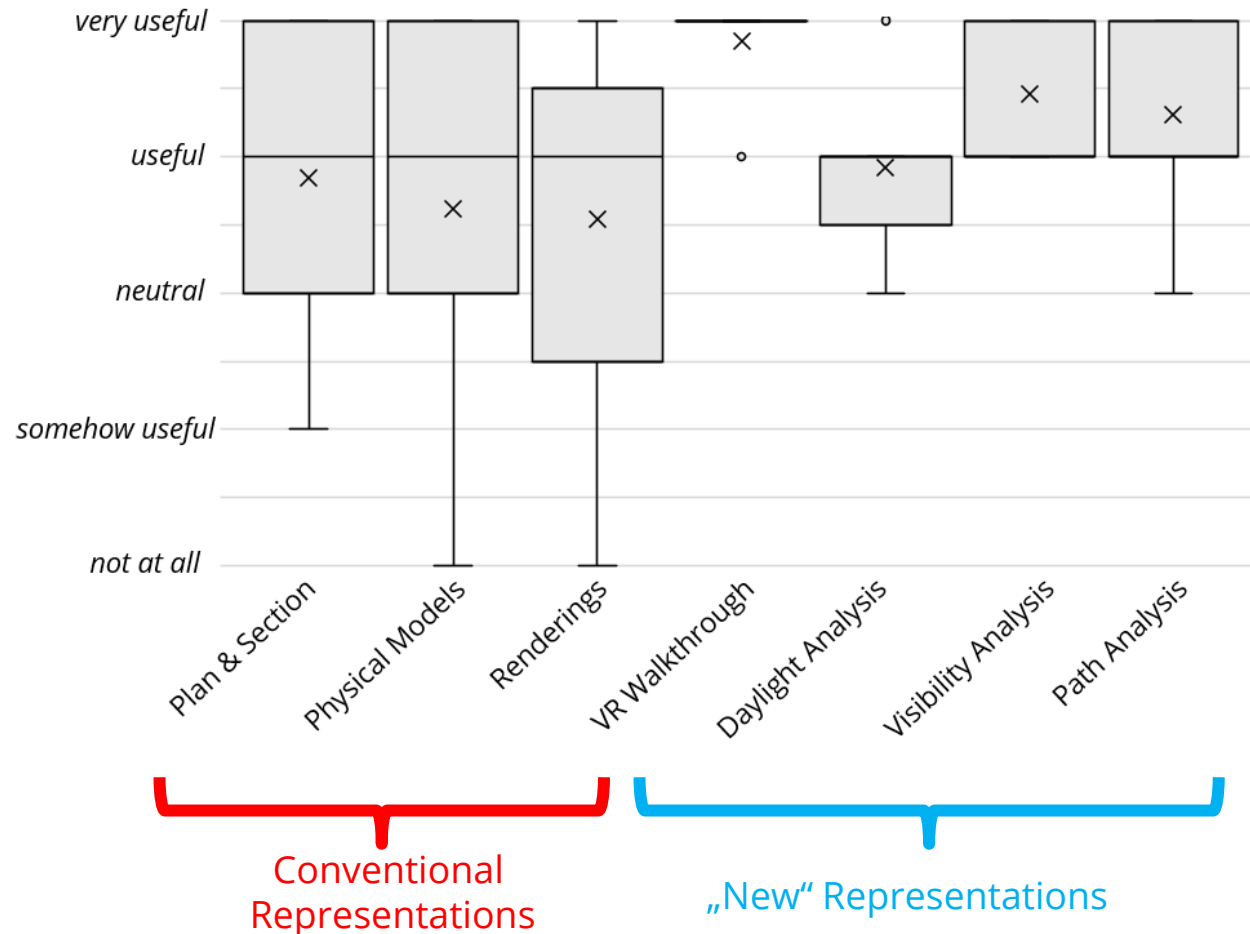
Comparison to Conventional Architectural Studios



EVALUATION

Architectural Representations for User Centered Design

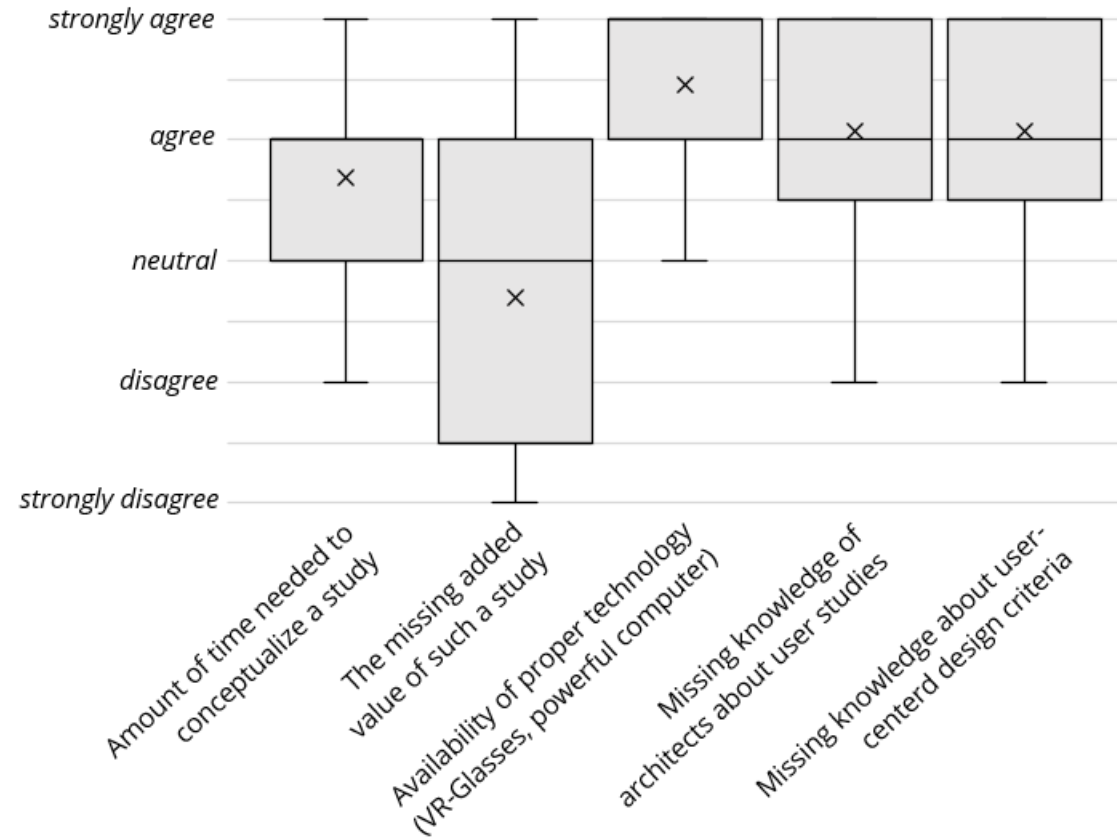
"How useful do you evaluate the following representations for better understanding user-centered design aspects?"

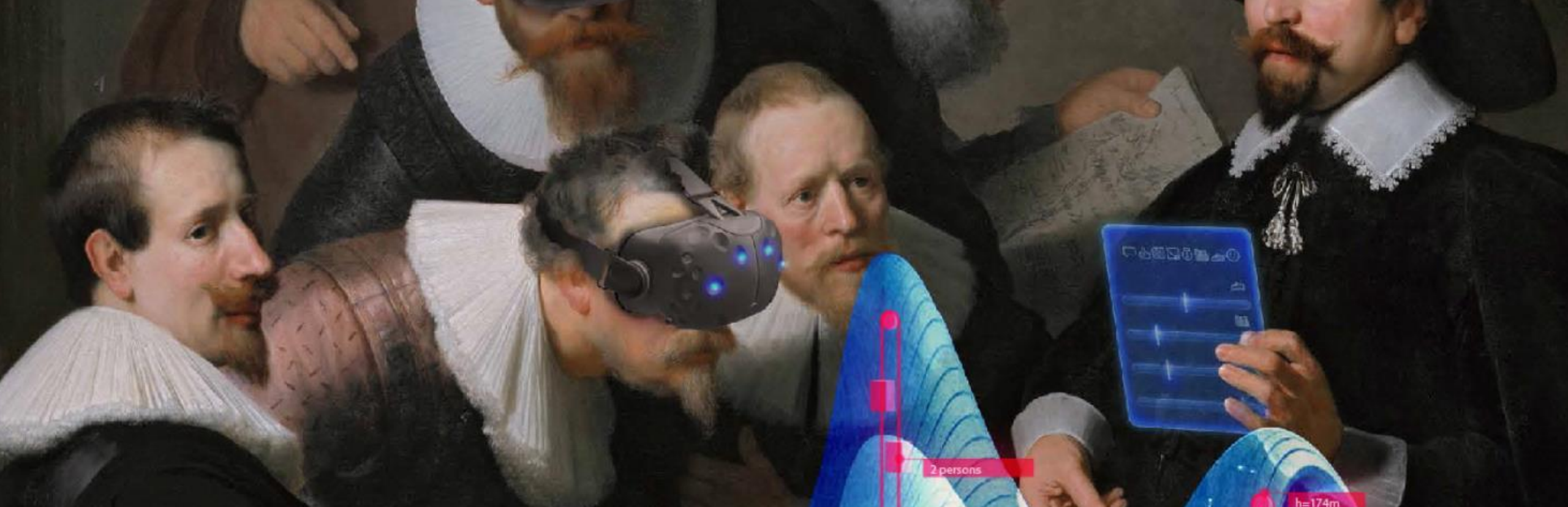


EVALUATION

Challenges for Applying User Studies in Architectural Design

"What are the biggest challenges for integrating user studies into the architectural design process?"





THANK YOU!

Questions, Comments?

Vertr.-Prof. Dr. Sven Schneider
Lehrstuhl Informatik in der Architektur

d=328m

2 persons

h=174m