Evidence-Based Design for the new Elmshorn Train Station

Bauhaus-Universität Weimar

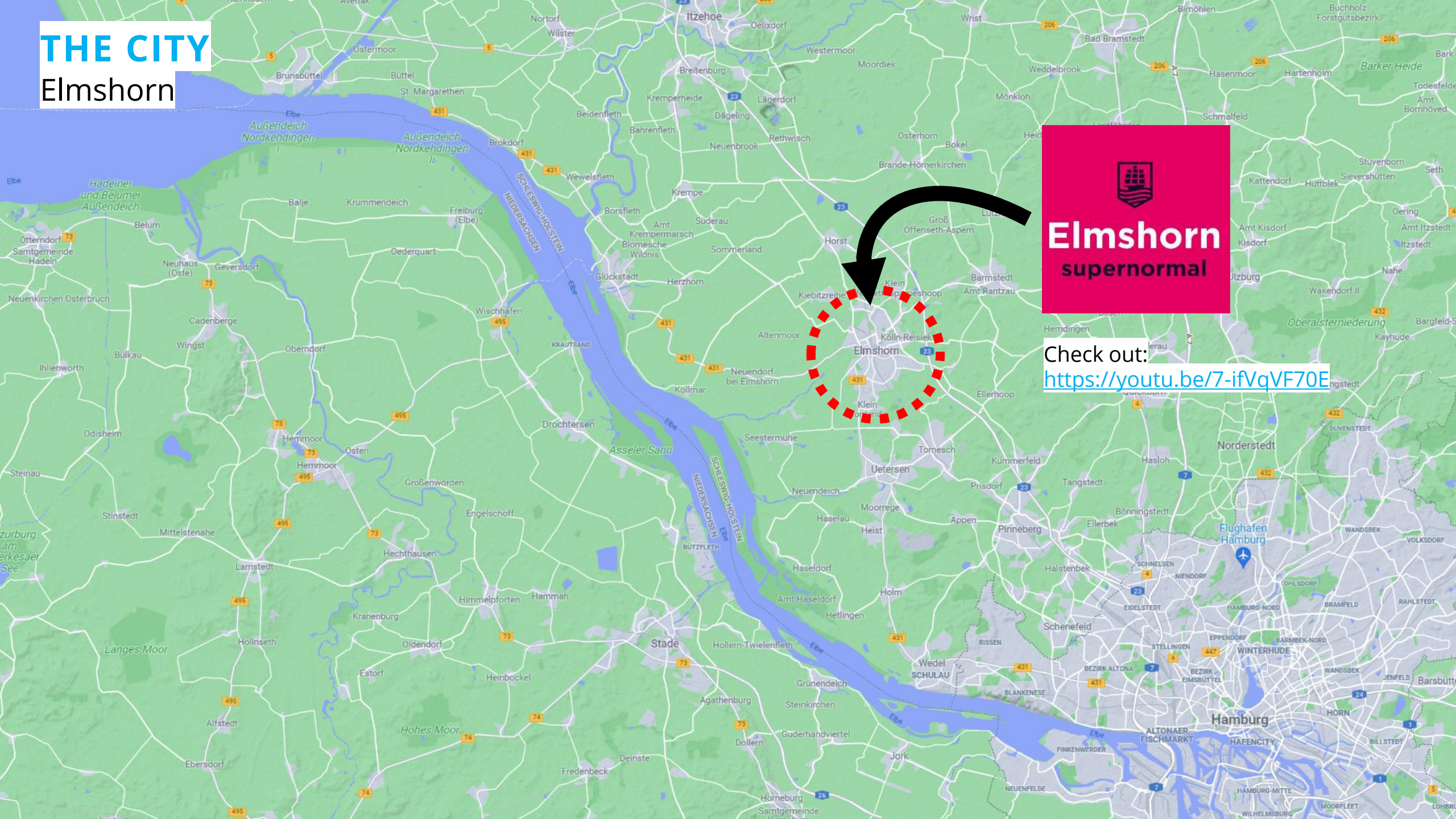
InfAR PLANNING.SYSTEMS

bauhaus ifex

WHY SUPERNORMAL?

Because Elmshorn is Supernormal!

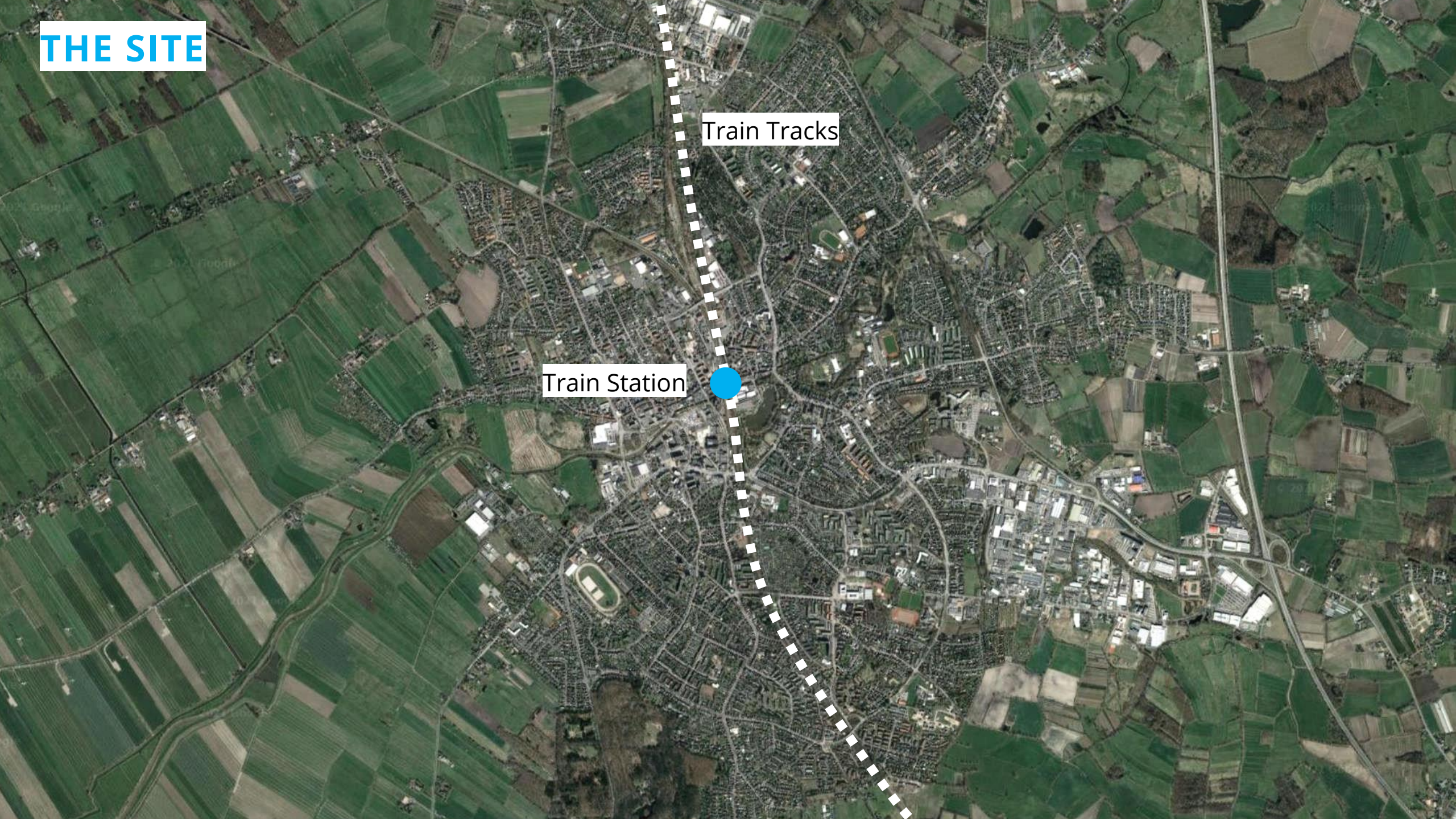
THE CITY
Elmshorn



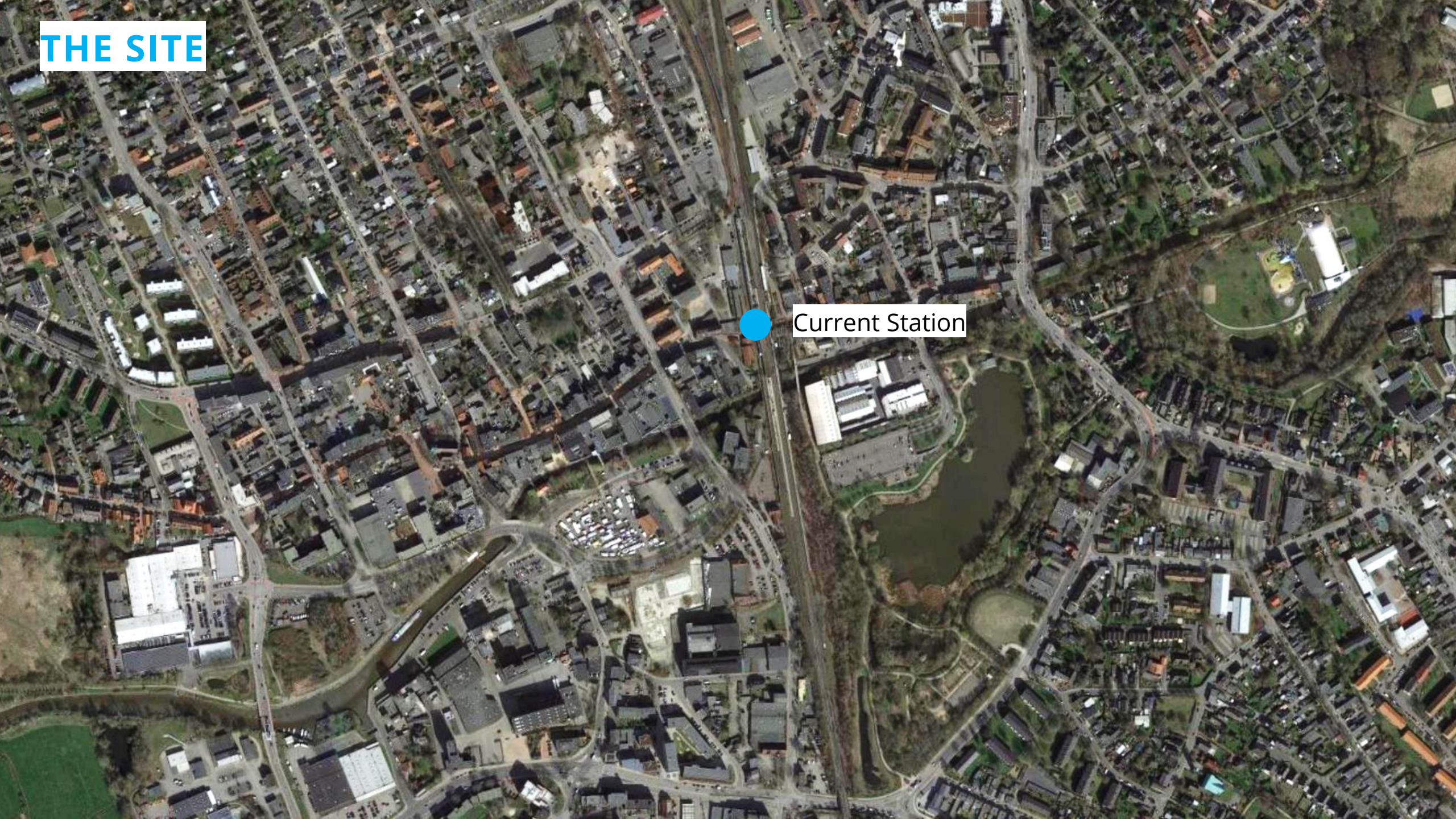
ELMSHORN

A supernormal city.

THE SITE



THE SITE



ELMSHORN TRAIN STATION

The current Station Building

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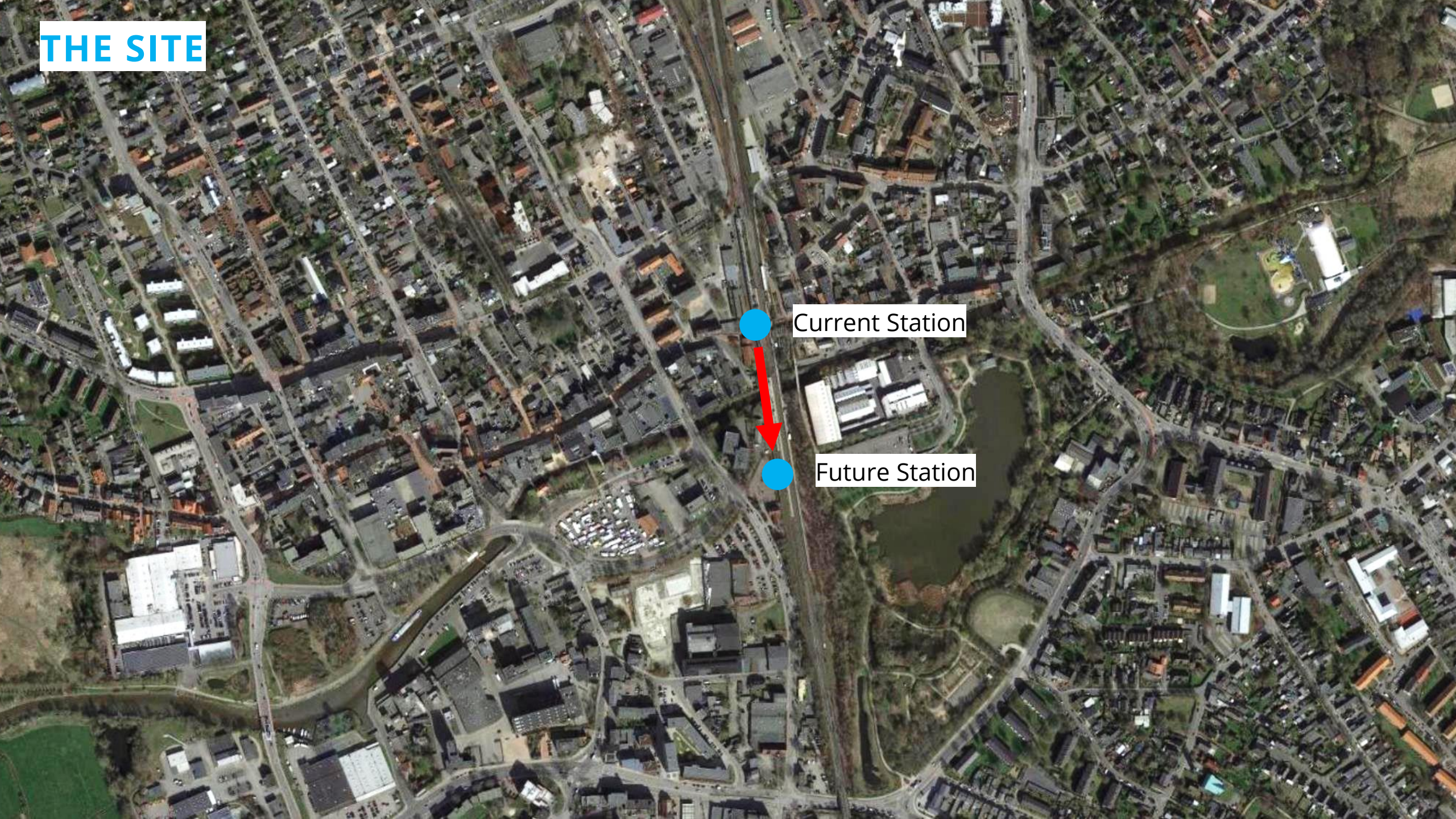
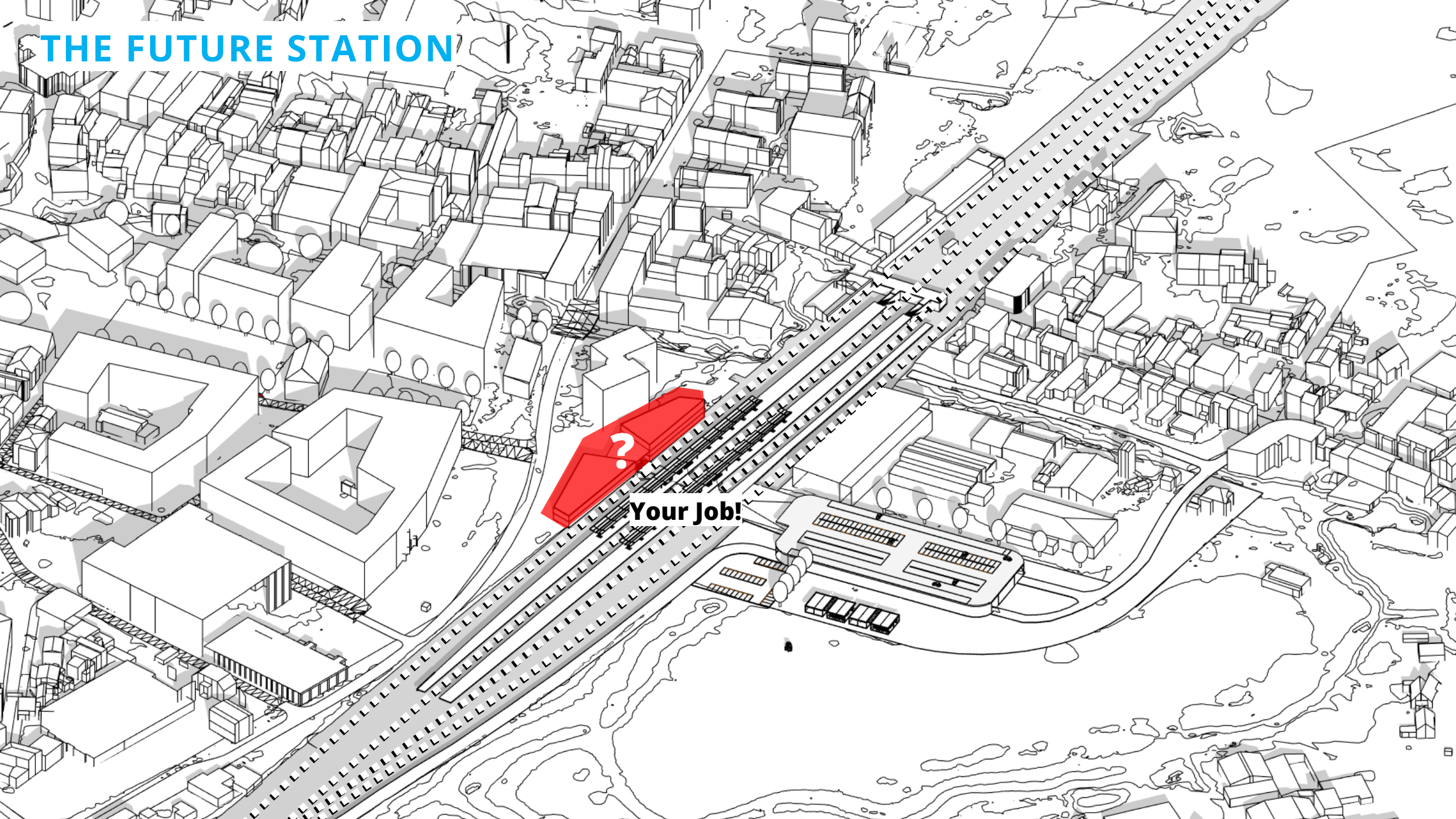
The current Station Building

THE SITE



THE SITE

THE FUTURE STATION

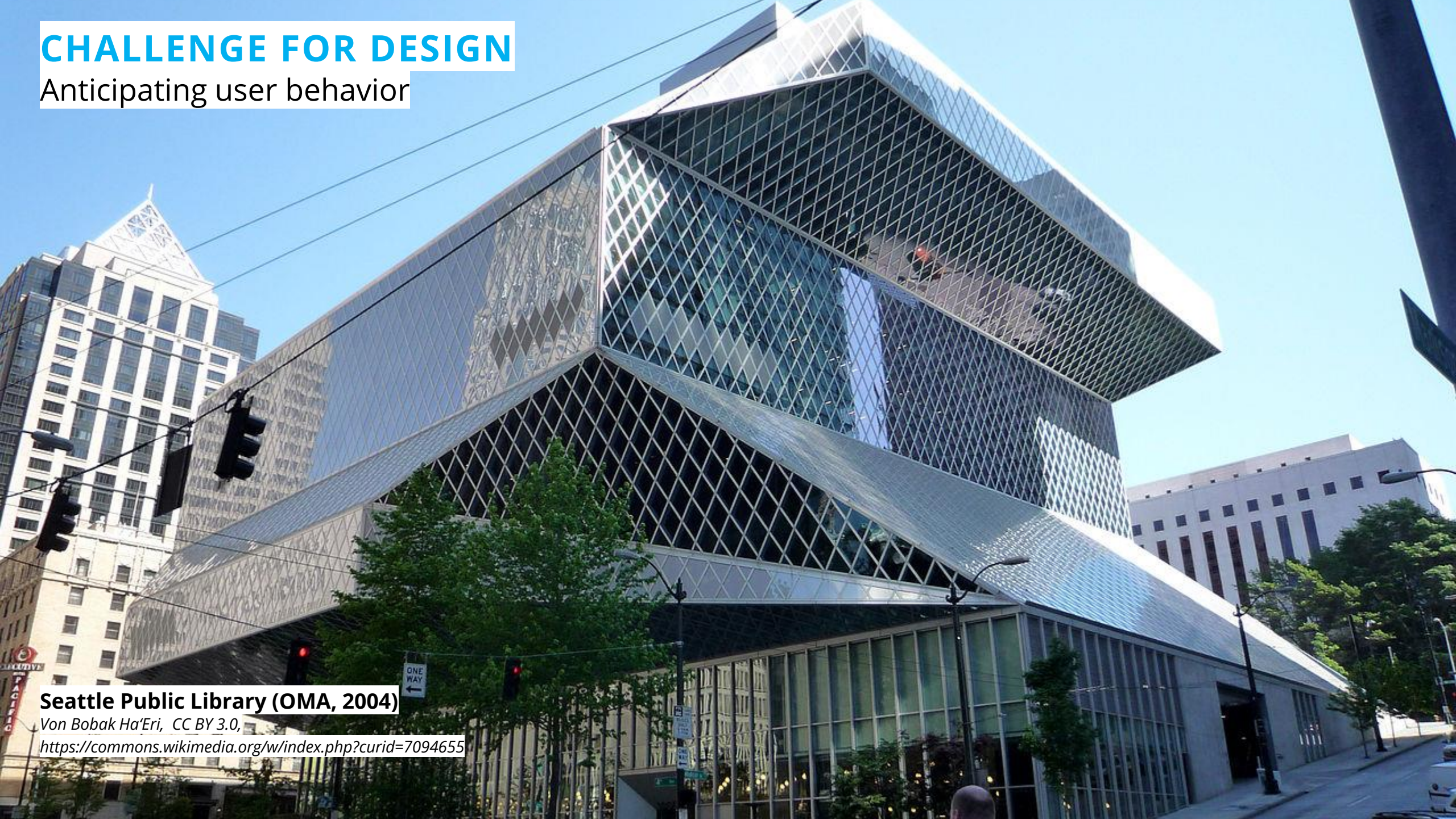


WHY EVIDENCE BASED?

Because that‘s supernormal too, isn‘t it?

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

CHALLENGE FOR DESIGN

Anticipating user behavior

Comments of users about the Seattle Public Library

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

CHALLENGE FOR DESIGN

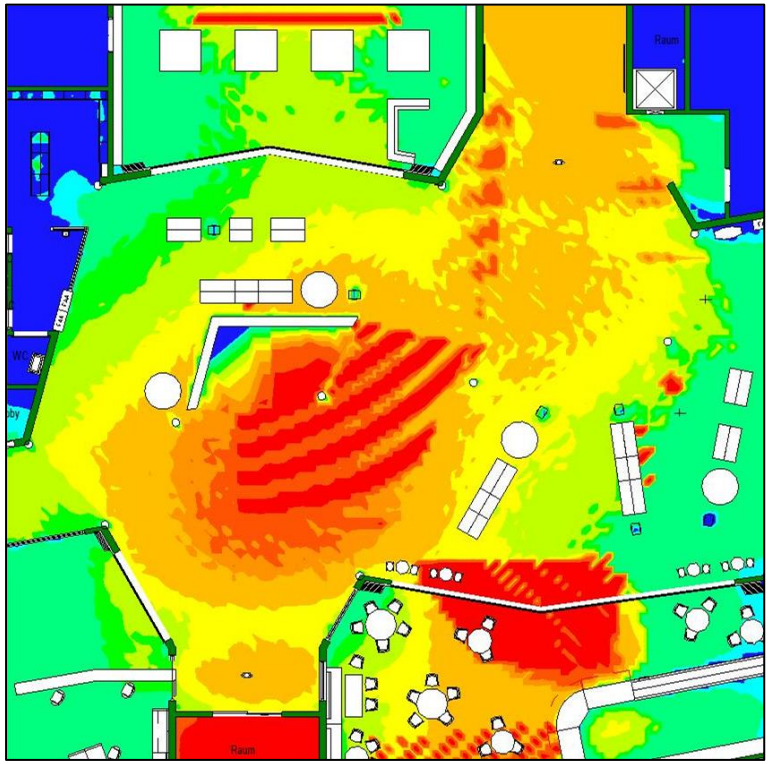
Anticipating user behavior

Lobby of the University Library, Weimar

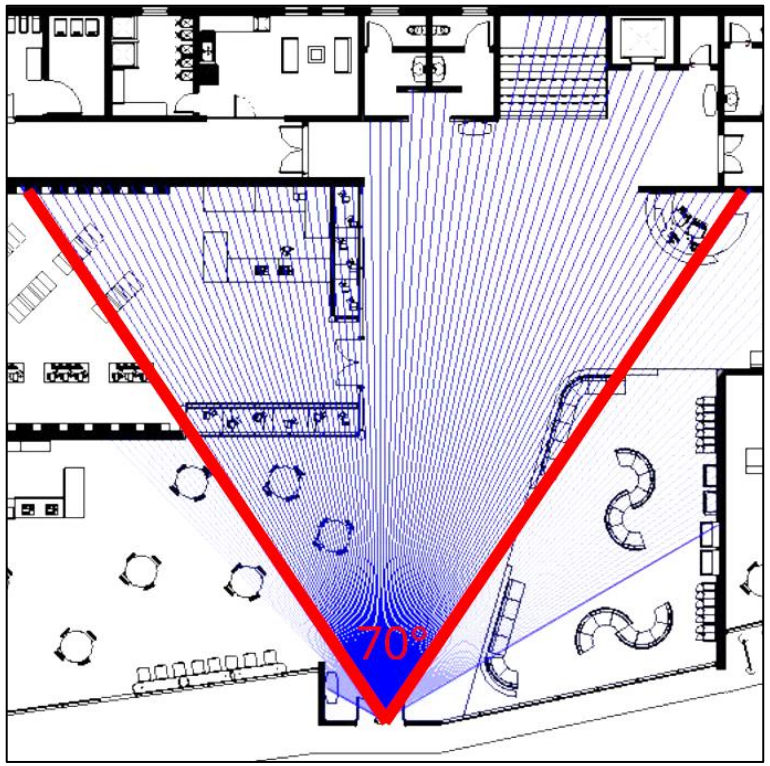
own picture

COMPUTATIONAL SPATIAL ANALYSIS

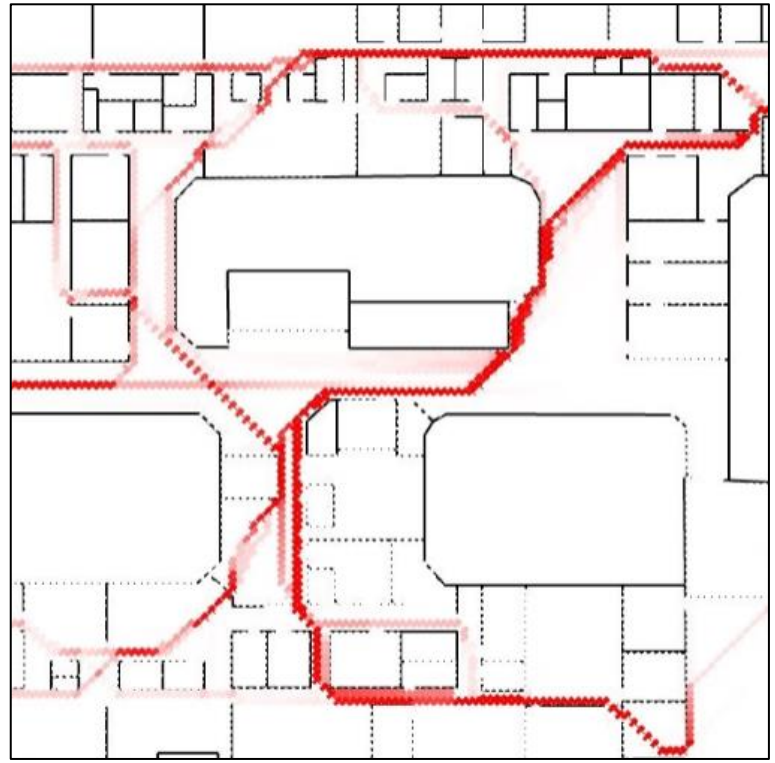
Calculate behaviorally & emotionally relevant features of buildings



Daylight



Visibility



Accessibility

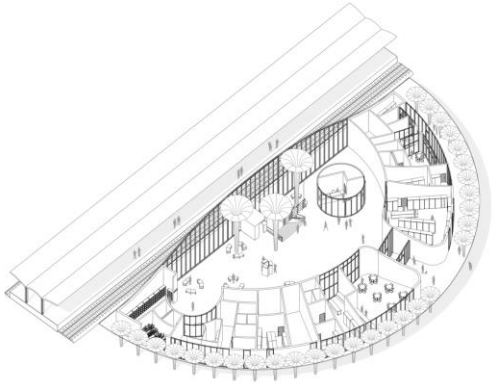
VIRTUAL REALITY BASED DESIGN EVALUATION (VREVAL)

Framework for User Studies

Funded by: DB NETZE DB Station&Service AG
Freistaat Thüringen Ministerium für Wirtschaft, Wissenschaft und Digitale Gesellschaft

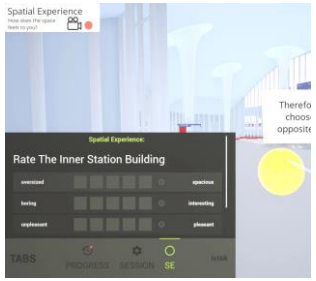
Feedback

(Re)design

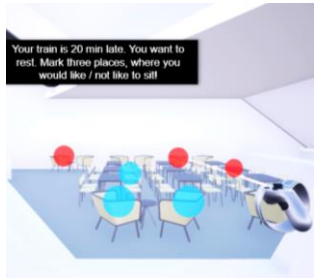


Digital Design Model

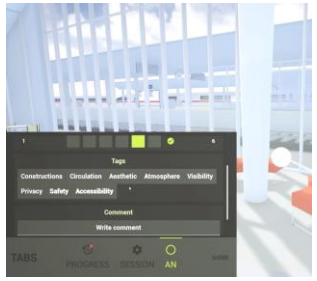
„Questionnaire“



„Pointing“



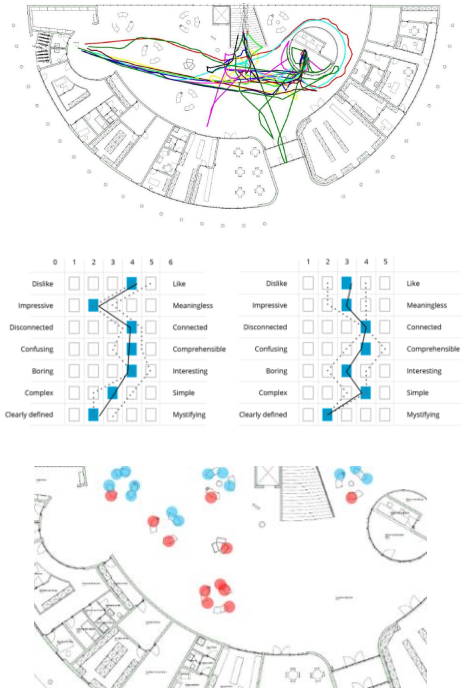
„Annotation“



„Wayfinding“

Study Modules

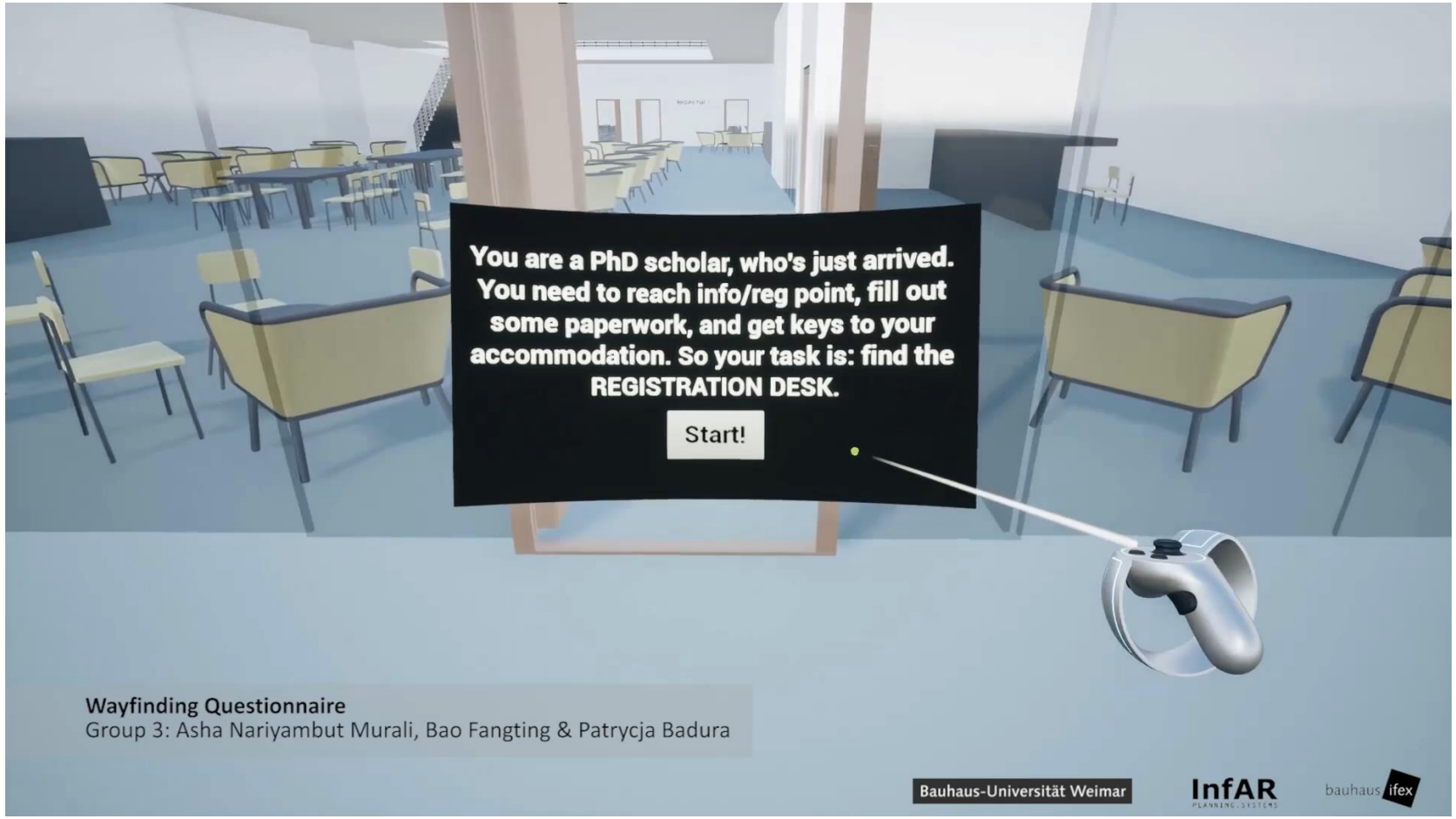
User Study



Results

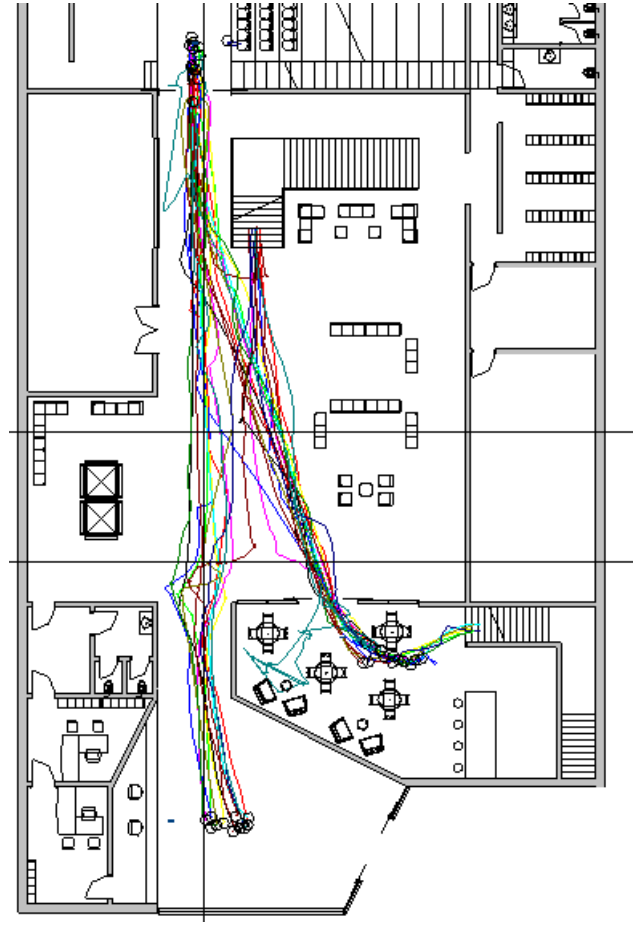
VREVAL

Module „Wayfinding“



Wegfindungsaufgaben in der virtuellen Umgebung

Students: Patrycja Badura, Bao Fangting, Asha Nariyambut Murali



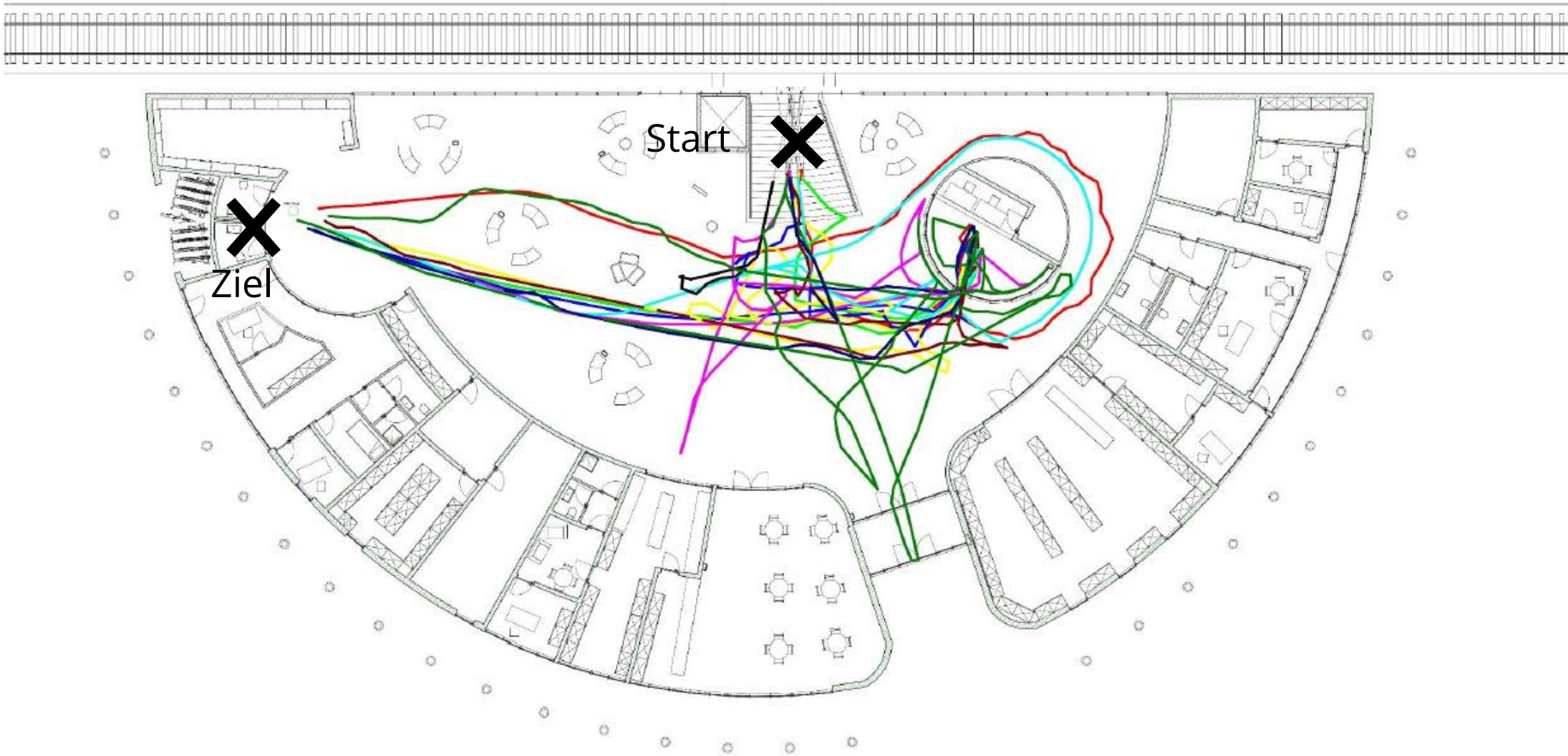
Visualisation in Revit

VREVAL

Module „Wayfinding“ - Example

VREVAL

Module „Wayfinding“ - Example

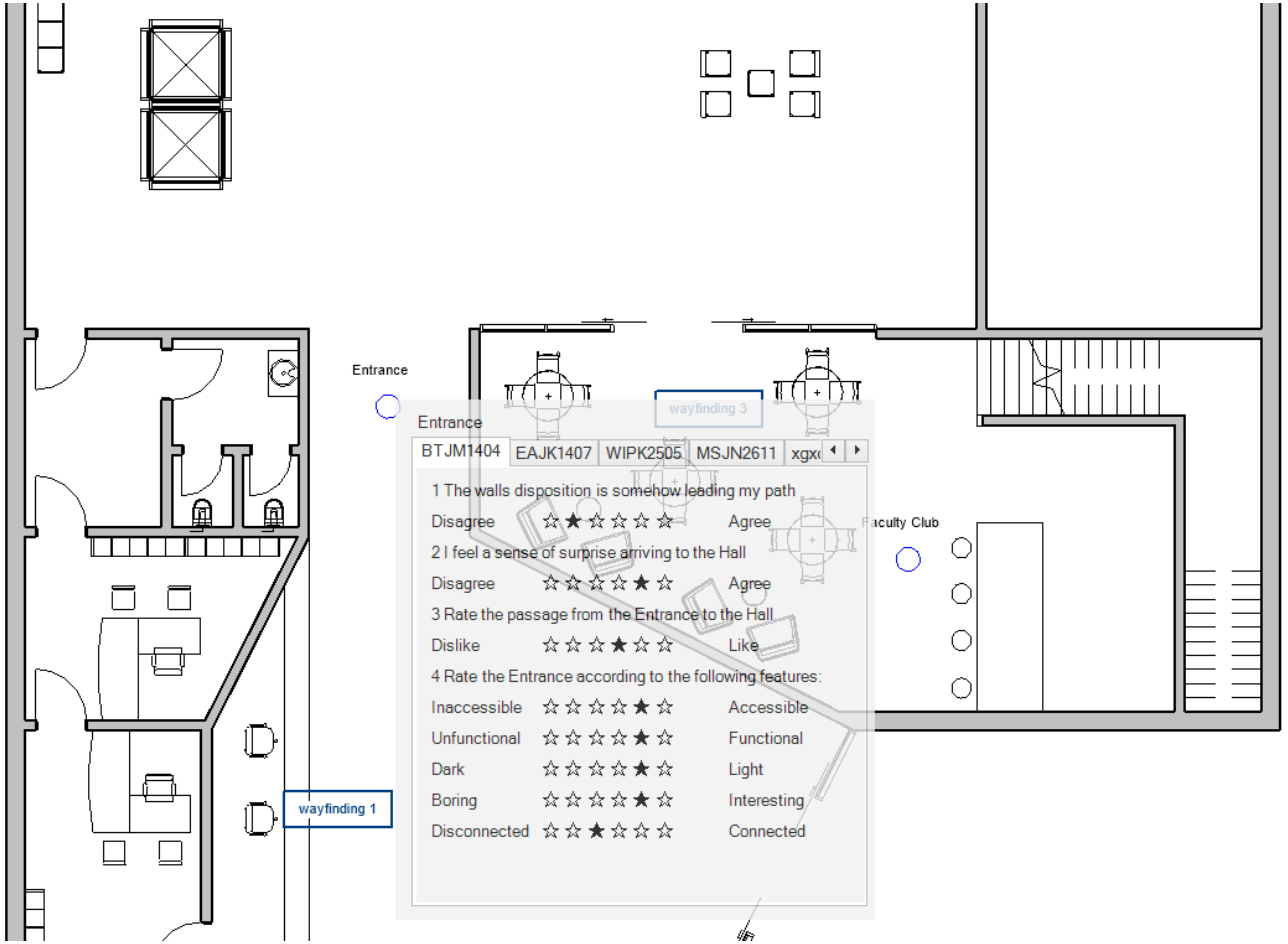


VREVAL

Module „Spatial Experience“

Questionnaire inside the Virtual Environment

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



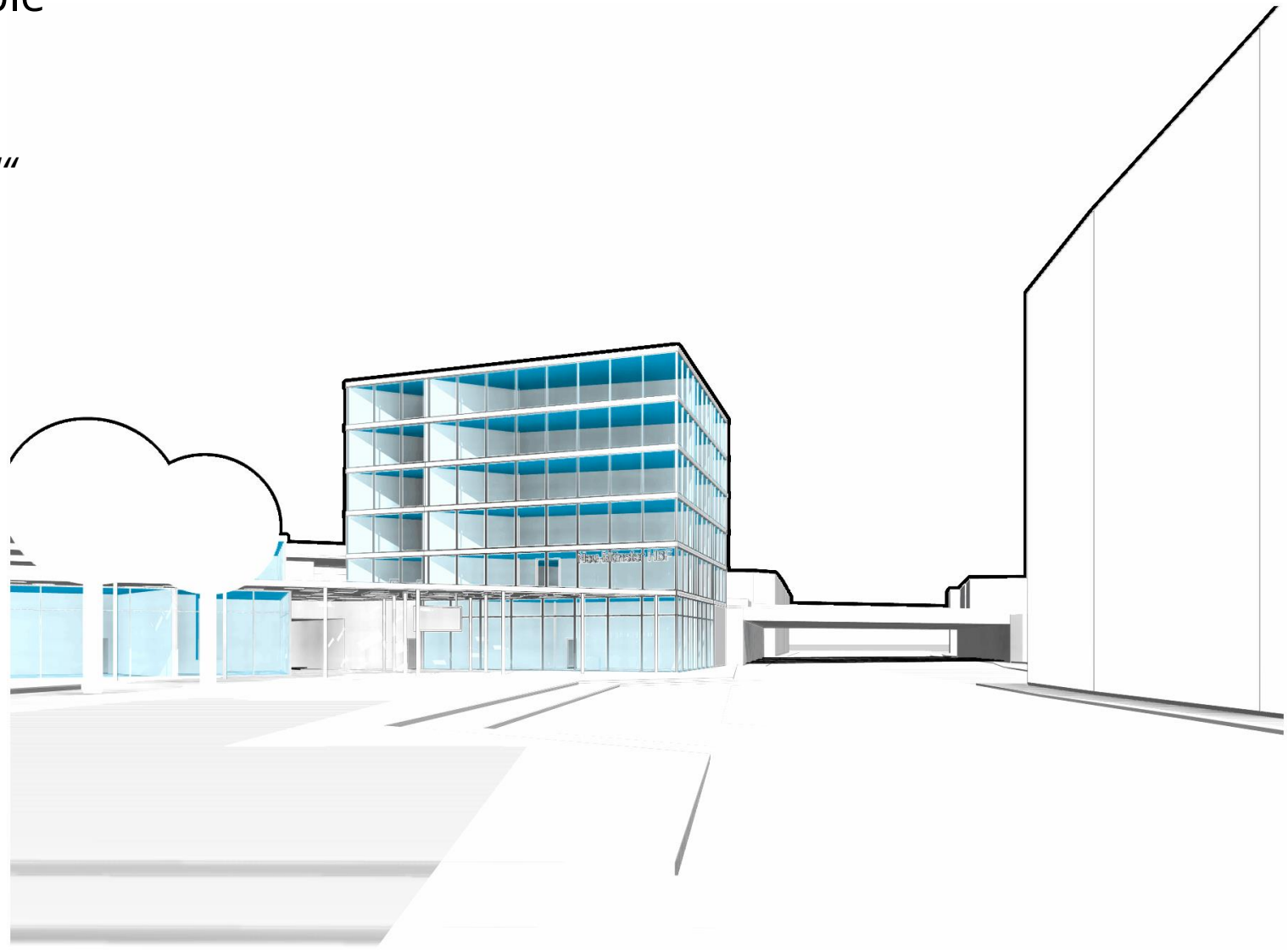
Visualisation in Revit

VREVAL

Module „Spatial Experience“ - Example

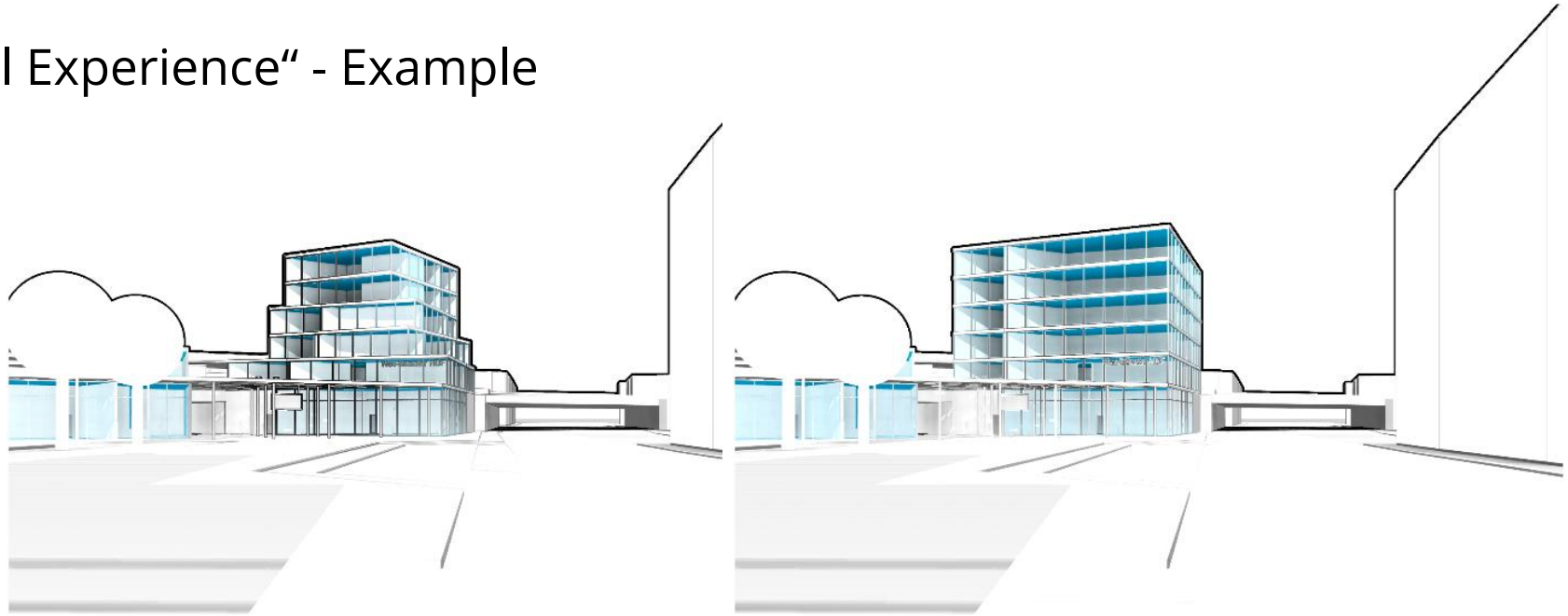
„Please rate the different building variants!“

Dislike	☐	☐	☐	☐	☐	Like
Impressive	☐	☐	☐	☐	☐	Meaningless
Disconnected	☐	☐	☐	☐	☐	Connected
Confusing	☐	☐	☐	☐	☐	Comprehensible
Boring	☐	☐	☐	☐	☐	Interesting
Complex	☐	☐	☐	☐	☐	Simple

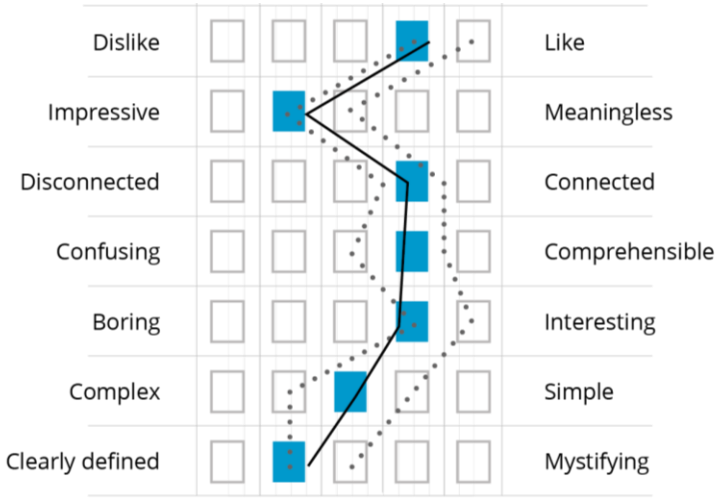


VREVAL

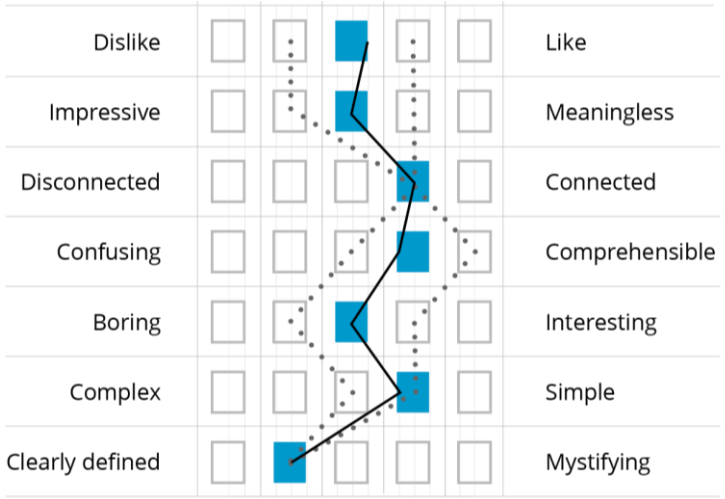
Module „Spatial Experience“ - Example



Variant A



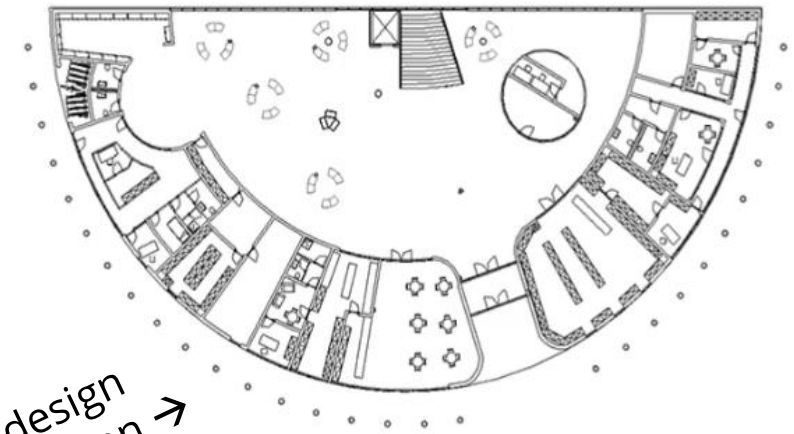
Variant B



EVIDENCE BASED USER CENTERED DESIGN

Workflow

Design

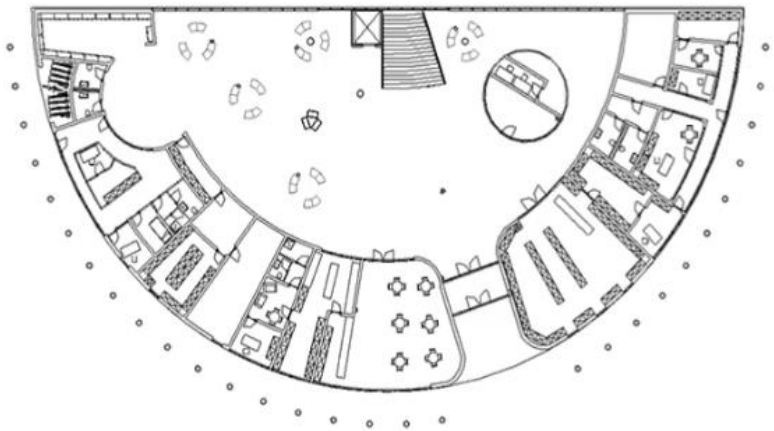


student design
for a train station →
from WS19

EVIDENCE BASED USER CENTERED DESIGN

Workflow

Design

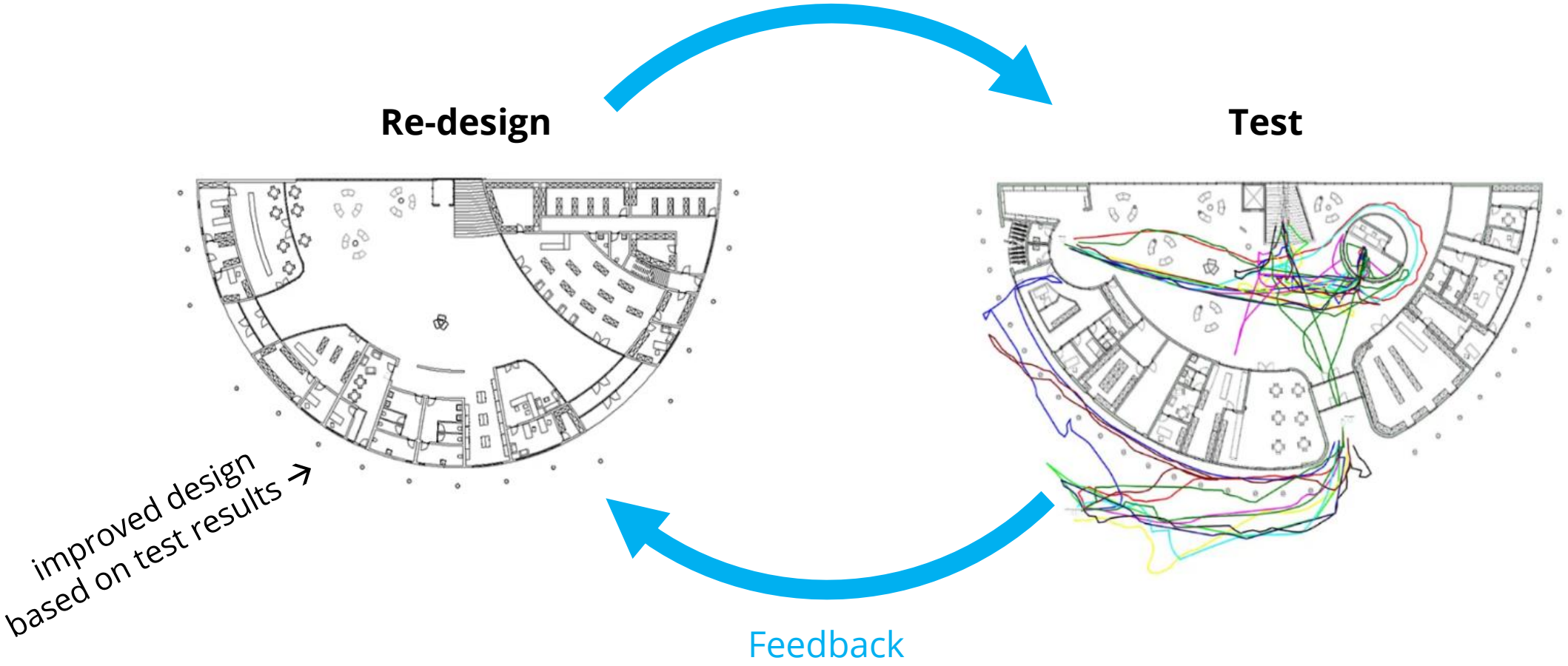


Test

← results from a wayfinding study

EVIDENCE BASED USER CENTERED DESIGN

Workflow

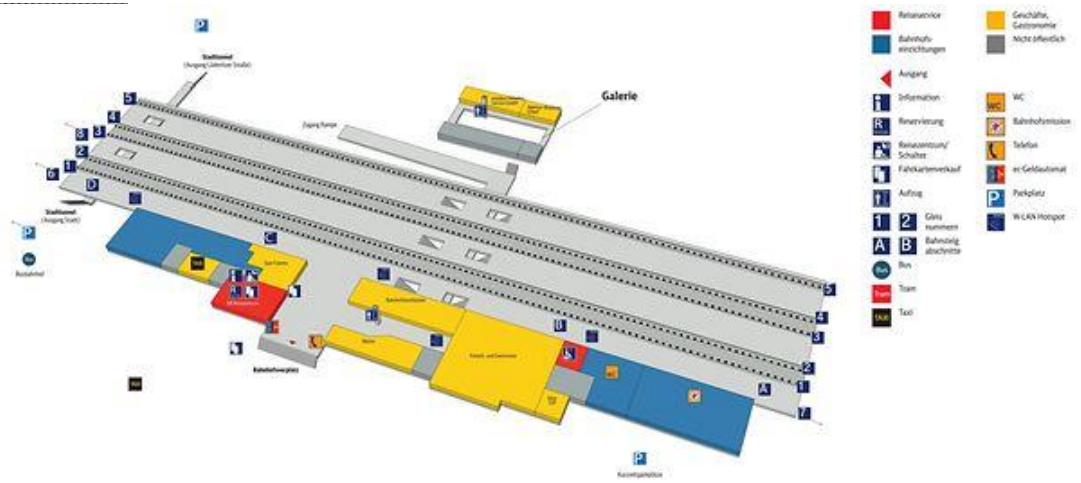


WHAT YOU WILL LEARN:

- Basics of Train Station Design
- Basics of User-Centered Design Evaluation
- Computational Spatial Analysis Methods (Daylight, Visibility, Accessibility)
- How to set up solid User Studies (with VREVAL)
- Building Information Modeling with Revit
- Parametric Modeling with Dynamo for Revit

MINI EXCURSION

Small Train Stations on the way to Elmshorn from October, 27th – 29th



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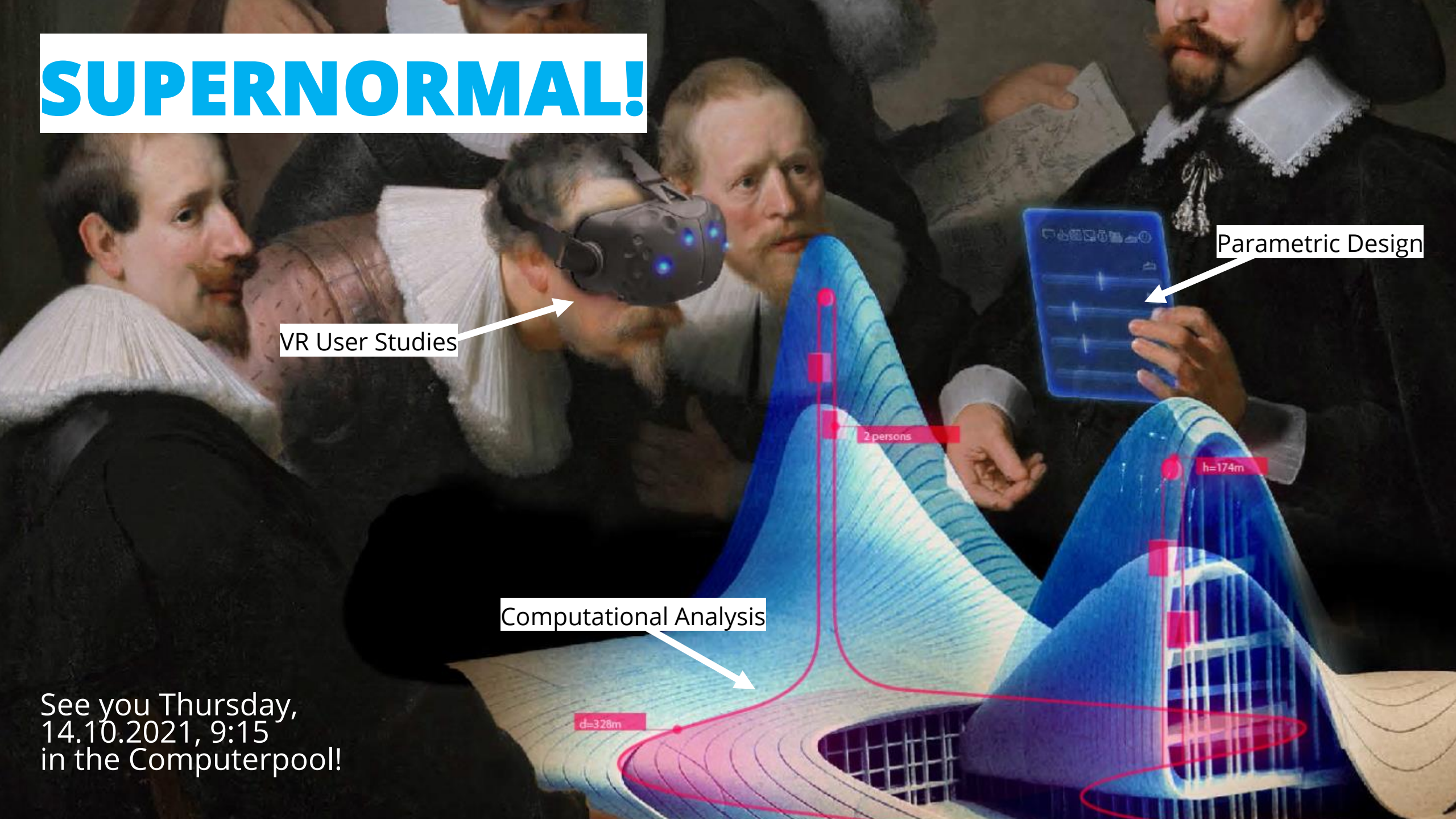
ORGANISATION

Weekly Schedule

	Monday	Tuesday	Wednesday	Thursday	Friday
9:15 – 12:30		**Seminar Parametric BIM** **Seminar User-Centered Architectural Design**		**Design Studio**	
13:30 – 17:00				**Design Studio**	

SUPERNORMAL!



See you Thursday,
14.10.2021, 9:15
in the Computerpool!

MORE INFORMATION

Paper on our VR-based User Study Tool VREVAL (english):
http://papers.cumincad.org/data/works/att/ecaade2018_361.pdf

Paper on our VR-based User Study Tool VREVAL (german):
https://dl.gi.de/handle/20.500.12116/37436

Interview on the use of VR in architectural education:
https://hochschulforumdigitalisierung.de/de/blog/digitale-lehre-meets-vrar-avril-2021

Examples from previous semesters:
https://www.uni-weimar.de/de/architektur-und-urbanistik/professuren/infar/teaching/detail/titel/train-station-neumuenster/