
Simlab
visualise to understand


TU
WIEN
raum simlab

Contents

Developing liveable spaces means designing structures with specific qualities related to usage, appearance, functionality and security. The design of our built environment and new urban developments calls for visionary ideas, which evolve out of holistic, agile views of the systems we are dealing with.

This allows us to achieve an equilibrium between ecological, economic and social variables in the interests of sustainability.

Developing ideas which enable the integration of entire systems and/or deliver the best options for adaptation within a transforming system is a step-by-step process. First, planners analyse the existing conditions, formulate a problem definition and compare emerging tasks with similar situations elsewhere.

The resulting findings, personal input and other influences allow a vision to emerge. Initially an intangible concept, the vision is further elaborated in an iterative sequence, being explored and tested from various angles and through different lenses to produce a concrete, implementable design.

In each step of the design process, from analysis to research, comparison, conceptualisation and especially within the iterative drafting sequence, digital support and data-driven input allow arguments to be framed as part of a collaborative planning process with multi-domain experts. Spatial visualisation thus constitutes the most important communication tool in planning disciplines.

The visual representation of a design idea allows a tangible narrative to be developed out of a set of arguments. Digital tools provide interactive support within the various planning phases and build a digital bridge between the different phases by enabling data exchange and access throughout the entire planning process.

Digital support allows emphasis to be placed on the main craft of planning, i.e. the need to reconcile expectations and ideas to produce a feasible concept for realisation in our living environment. Today the planner's task is not to simplify, but rather to elucidate the information and data available in order to frame arguments.

Dr. Julia Forster
Head of the Simlab

Technological advancement has added numerous new methods and tools to the "toolbox" of spatial planners and architects. Modern sensory technologies enable an expanded perception of space, while sophisticated and advanced simulation methods help us to understand underlying processes and obtain a picture of different future spatial scenarios.

However, planning is not an exclusively technological matter, but a social and communicative process. As such, visualization tools not only define a pre-set image of the future but also provide a solid basis for communication and discussion and to support decision-making.

The large number of successfully completed and ongoing projects show that the Simlab is a valuable knowledge resource at the Institute of Spatial Planning. As a partner in these initiatives, the Simlab team provided valuable insights and findings that would have been impossible to obtain by traditional methods.

These competences have helped the Simlab to build up an international cooperation network with various universities and research institutes, but also with associations, public bodies and private companies.

Besides its cutting-edge technological equipment, another crucial factor behind the Simlab's success is the expertise of its interdisciplinary team. Led by Dr. Julia Forster, recipient of the Ressel Prize for her dissertation, the keen young researchers at the Simlab bring along innovative ideas, backed up by solid, in-depth knowledge, contributing to the international competitiveness of our institute.

The Institute of Spatial Planning sets great value on high-grade teaching activities. The Simlab makes a significant contribution to training the planners and architects of the future. In their student projects they are able to acquire the skills and competences that are needed to address contemporary and future challenges in planning in a meaningful and effective way.

As the head of the Institute of Spatial Planning, I am always happy to visit the Simlab and try out their technological equipment. I would like to thank their team for their untiring commitment, an important enrichment for our institute.

Dr. Martin Berger
Head of the Institute
of Spatial Planning

Spatial planning needs to reflect the complexity of the world we live in. The development of visions, ideas and plans is a communicative and iterative process, consisting of knowledge, creativity, courage and a positive mindset regarding the future.

As spatial planners, we can utilise our professional skills, competences and experience in planning processes, but a successful plan needs to incorporate and synthesise ideas from a broader community. When developing a transformation concept everybody involved is an expert, as it is they who know and live in the spaces concerned.

A main task of planners, therefore, is the coordination of idea development, proposing visions under particular circumstances and iteratively reflecting upon them with further stakeholders and the wider community.

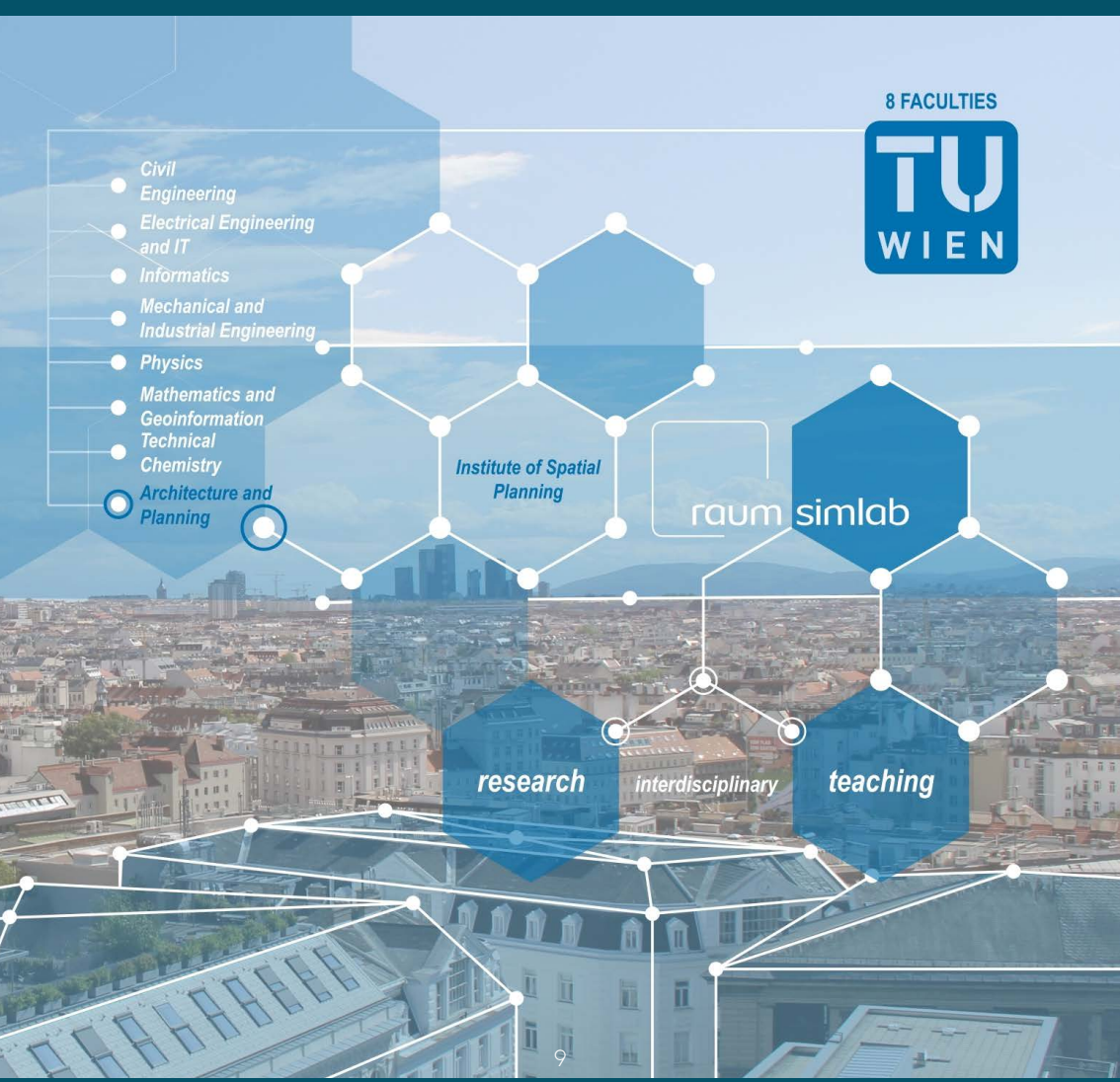
Modern planning and decision-making support tools are able to facilitate such processes. The Simlab team have the unique competence in using state-of-the-art ICT-based tools to stimulate the development, synthesis and concretisation of ideas in an open and inclusive way.

As the head of the Research Unit for Local Planning I am very happy to support the Simlab team through their various projects and endeavours, such as building up mobile VR equipment for presenting designs developed with students for the alpine industrial town of Eisenerz. There, on site, we were able to reach various people, old and young, locals and visitors, which led to lots of fruitful discussions about the future of the town.

This is just one of the many experiences I could not have partaken in without the Simlab team, therefore I am very keen to accompany them in their further initiatives and undertakings. I also want to thank them for enriching our research unit, not only with their knowledge and equipment, but also with their friendly, cooperative, amiable manner that makes them a major asset for our team as a whole.

Dr. Andreas Voigt
Head of the Research Unit
for Local Planning

Visitors of a popup exhibition watching a demonstration of spatial transformation scenarios in the Styrian town of Eisenerz using a mobile VR setup


8 FACULTIES
TU WIEN
Civil Engineering
Electrical Engineering and IT
Informatics
Mechanical and Industrial Engineering
Physics
Mathematics and Geoinformation
Technical Chemistry
Architecture and Planning
Institute of Spatial Planning
raum simlab
research
interdisciplinary
teaching

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The Spatial Simulation Lab at TU Wien – Simlab for short – is an interdisciplinary research laboratory with a special focus on the combination of emerging visualisation tools and urban or spatial planning. It is part of the Faculty of Architecture and Planning and the Institute of Spatial Planning of TU Wien.

The research staff at the Simlab concentrate on research into visual analytics, visualisation of spatial data using state-of-the-art graphic technologies, and the integration of the latter into urban planning and decision-making processes.

The lab is located on the premises of the Institute of Spatial Planning at the central urban campus of TU Wien, Karlsplatz. It is equipped with digital tools to support urban planning and decision-making. Virtual reality (VR) technologies allow multiscale, three dimensional stereoscopic, interactive real-time processing of spatial data.

Strategic overviews of spatial problems can be obtained, various scenarios and potential solutions tested, interventions and their effects investigated and spatial interactions identified. Interdisciplinary visualisations of spatial systems can thus be produced, enabling individual and above all team-based elaboration of holistic system overviews, which allow the examination of interrelated effects and causal relationships.

The facilities at the Simlab can therefore be used for a diverse range of research projects as well as for exploring new trends in design-based teaching and science in the context of spatial planning.

Research projects at the Simlab focus, among other topics, on strategic inward development of settlement systems and spatial energy planning, resilience of spatial structures and infrastructures, and the sustainable design of urban spaces.

A main objective of the Simlab is the enhancement of existing formal and informal planning instruments, always following the key principle:

SIMLAB – VISUALISE TO UNDERSTAND.


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Our Team

The competences of the Simlab team cover the disciplines of spatial planning, architecture and computer science. Within the field of planning, our strengths lie in visual and data-based spatial analysis and design.

A strategic, in-depth approach to space is one of the core rationales behind initiatives of the Simlab, mostly focussing on the development of supply infrastructures along corridors as well as urban settlement structures.

This mix of competences enables effective handling of relevant issues on various thematic and spatial levels and an interrelation of causes and effects between macro-regions, cities, neighbourhoods or even buildings.

Beyond technical and discipline-related know-how, the Simlab team are also able to successfully manage and facilitate the involvement of different stakeholders or non-professionals in planning processes in order to facilitate the understanding of specific challenges and potential solution processes.

julia.forster@tuwien.ac.at

Julia Forster
is an architect concerned with strategic visualisation of energy and mobility data in settlement areas as a tool to support planning and decision-making. She completed her PhD under the auspices of the URBEM doctoral college and was awarded the TU Wien Ressel Prize 2017 for her PhD. Her research focuses on digital spatial visualisation for holistic system views and agile collaboration among domain experts.

Main research interests:
strategic visualisation, decision support, spatial visualisation

stefan.bindreiter@tuwien.ac.at

Stefan Bindreiter
is a spatial planner with a research focus on algorithm-based analytical tools for spatial planning and the concrete application of these methodologies in the creation and implementation of planning strategies. As a trained software developer with several years of professional experience in software development companies he takes care of the lab's hard- and software and prepares VR environments.

Main research interests:
algorithmic planning, VR in spatial planning, web-based cartography

balazs.cserpes@tuwien.ac.at

Balázs Cserpes
is a spatial planner with a keen interest in a critical assessment of novel technologies in spatial planning and is on the search for answers how ICT- and data-driven solutions might make our cities and regions more sustainable and livable, while not forgetting the dangers and pitfalls behind these developments. He has international work experience both in the academic world and in the private sector. In his master's thesis he focussed on the analysis of social-media information, based on 8.3 million tweets generated in London, and reviewed the usefulness of such data in planning processes.

Main research interests:
novel technologies in spatial planning, interactive visualisation, society and technology

isabella.schuster@tuwien.ac.at

Isabella Schuster
is a spatial planner with professional experience in infrastructure planning and visualisation for municipal stakeholders. Currently she is working on her PhD in spatial planning within the framework of the International Doctoral College – Spatial Research Lab "Crossing Borders, Activating Spaces". Her main research focus lies in the interdisciplinarity of spatial development and entangling planning processes.

Main research interests:
interdisciplinarity of spatial planning and entangling planning processes, infrastructure planning and its spatial impact

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Kilian Koppensteiner
has been studying spatial planning since 2016 and is committed to the visualisation of information, especially related to public transport and maps. The focus of his Master's Degree lies on urban development and cartography. Experienced in designing maps and graphics, he suports the Simlab team since 2021 in visual and administrative tasks

Main research interests:
visualisiation of (traffic related) data, interactions between traffic, mobility and cities, traffic flows and routing

Lena Hohenkamp
studied business administration at the University of Regensburg, where she completed her Bachelor of Science in 2015. Since 2015 she has been studying spatial planning at TU Wien. In 2018 she completed a semester abroad at the École Nationale Supérieure d'Architecture de Strasbourg. She gained international work experience in Le Vésinet, France and in Hamburg. At Simlab she provides support in international research projects and helps with the organisation of teaching activities.

Peter Kugler
is a trained IT technician with multi-year experience on international projects, plus a long track record in the planning and installation of stage and lighting technology. Peter joined the Institute of Spatial Planning in 2019 and supports Simlab in server infrastructure and hardware issues, ensuring that the work equipment is reliable and ready for use.

Doris Mayer
always keeps her eye on the big picture. Doris ensures the efficient organisation of Simlab's activities and supports the team in all administrative matters.


Smalltalk.
Das bittere Ende
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Research

Mission

In order to analyse a space and its characteristics, spatial planning makes use of various methods of reconnaissance and investigation. On-site inspections and field surveys are carried out to explore the space and obtain a multi-sensory perception of it. These explorations provide the basis for further analyses and are extremely well suited for generating an understanding of the challenges and problems specific to the space.

The findings and results thus obtained can be analysed in greater detail using analogue mapping, sketches and visualisations and supplemented by additional descriptive and numeric data. CAD and geo-information systems can also be used for digital storage of this analogue data. In this way, data and findings can not only be stored long term but also passed on to others and used elsewhere.

The Simlab develops digital planning environments (visual analytics) as a visual support tool for use in complex planning tasks.

Requirements and government policy goals concerning sustainable conservation of resources are giving rise to the development of new supply, infrastructure and waste disposal technologies (mobility, buildings, thermal and electrical energy, waste water, etc.). As a result, settlement development structures are becoming increasing interdisciplinary and the associated planning processes increasingly complex.

Geo-located and geo-locatable data provide an important basic tool to support planners in analysing an existing settlement system, extrapolating future developments and assessing the effects of planning measures. These fundamental data are generated by the built and planned environment and the actors within it.

In order to make use of these fundamental data as a support tool for all parties involved in planning and the associated decision-making processes, the Simlab focuses on two essential areas. The first is GIS and CAD-based spatial analysis to elaborate a quantitative and qualitative basis for planning discussions.

In order to process the results for use by stakeholders in planning processes and superimpose findings from various other disciplines, a further focus is on spatial visualisation of data. The use of interactive systems for spatial visualisation allows multiscale, interdisciplinary presentation of the underlying data.

At the Simlab, information can be presented to planning stakeholders in 2D and 3D. The lab environment provides a parallel stereoscopic view of the scenarios for up to 15 process participants. The Simlab thus provides digital support for planning processes and a visual tool that facilitates communication in projects requiring interdisciplinary planning.

trAILs

Alpine Industrial Landscape Transformation

Industrial change in Europe is also accompanied by the decline of traditional heavy and manufacturing industries in peripheral and less urbanized regions, such as the Alpine Space. This results in huge disused industrial sites: Alpine Industrial Landscapes (AILs).

trAILs - Alpine Industrial Landscapes Transformation - was launched in April 2018 as part of the Alpine Space INTERREG programme with 10 project partners from five different Alpine Space countries.

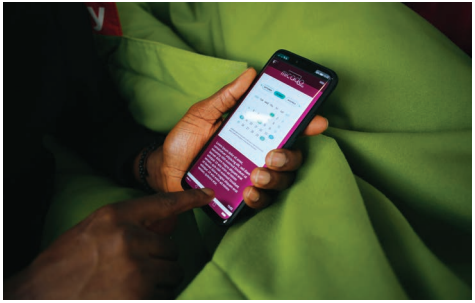
The aim of the project is to generate significant knowledge about AILs (Alpine Industrial Landscapes) and to develop and test sustainable transformation strategies that are applicable and replicable throughout the Alpine Space. To ensure a multidisciplinary and transnational approach, the project combines the disciplines of spatial and landscape planning, socio-economic sciences and ecological regeneration. In addition, there is direct cooperation with local communities at four pilot sites in Austria (Eisenerz), Italy (Borgo San Dalmazzo), France (L'Argentière-la-Bessée and La Roche-de-Rame) and Slovenia (Tržič).

The main tasks of TU Wien are on the one hand to provide the spatial planning expertise, and on the other hand to set up a database, which collects not only the data on the pilot sites but also information about other brownfields in Austria, Italy, France and Slovenia. The collected data will be presented in the form of a homepage, which also contains an interactive web map.

Project duration	04/2018 - 05/2021
Funded by	Interreg Alpine Space Programme
Lead partner	TU München
Project website	https://www.alpine-space.eu/projects/trails/en/

MICADO

Migrant Integration Cockpits & Dashboards



Credit: Project MICADO

Credit: Project MICADO

The goal of MICADO is to offer an easy-to-use ICT-based assistance tool to help migrants in the first weeks and months upon arrival in European cities. This tool consists of a mobile application guiding newcomers within the topics of housing, labour, education and health. In addition, the project is developing a common migrant data and user management platform for public authorities that facilitates the coordination of processes between migrants, public authorities and civil society organisations.

By bringing together data and information from different sources, the MICADO platform provides insight into key challenges and tasks in an interactive dashboard. This approach helps to identify specific needs of users, leading to improvement of the quality of public services and better management of the resources of cities, authorities, and civil society ogranisations.

The project applies the competence of 15 organisations from five European countries working in the domains of research, administration, and social assistance. Testing of MICADO is being carried out in four European cities – Hamburg, Bologna, Madrid, and Antwerp – but the final product will provide a flexibility will enable a successful application in many other places in Europe.

During the course of the project, Simlab is focussing on spatial data processing and visualisation options and providing input on technical questions, taking account of the specific challenges resulting from complex urban and social processes.

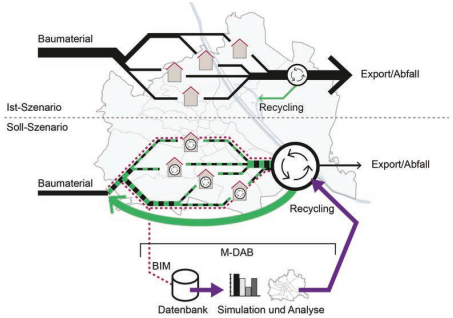
Project duration	01/2019 - 06/2021
Funded by	H2020-Programme of the European Commission
Lead partner	HCU Hamburg
Project website	micadoproject.eu

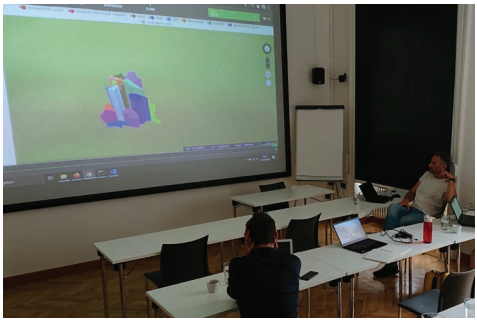
micado
migrant integration cockpits & dashboards

This project has received funding from the European Union's H2020 Innovation Action under Grant Agreement No 822717.

M-DAB

Digitise, analyse and sustainably manage the city's material resources





Building materials and methods of building construction define the building stock within a particular urban development phase and also determine the waste we have to deal with in future. 70% (~44 million tonnes) of Austria's annual waste volume originates from the building industry. In addition to environmental interests, waste management also takcles the economic aspects to implement practicable processes to make better use of these resources.

The project is investigating how digital technologies can support the determination of existing and future material resources in the construction industry, both qualitatively (materials and their recycling) and quantitatively. The results can be used for temporal and spatial mapping of material resources and disposal costs.

Planning scenarios are being used to simulate how resources can be used in a more sustainable way, how a better recycling balance can be achieved and how the future built environment can be made resource-efficient in both economic and environmental terms. A planning tool is being developed, which visualises calculations and simulation results. This provides a basis for communication and decision-making for stakeholder groups from the executive planning disciplines, as well as administrators and policy-makers.

As project lead, the Simlab is involved in the design of simulation logic and the visualisation concept. Furthermore, it provides a spatial database, which contains attributes of the building stock and forms the basis for the simulation.

Project duration	09/2019 - 02/2021
Funded by	ENERGIE DER ZUKUNFT, SdZ 6th call for projects, 2018
Lead partner	Simlab
Project website	https://projekte.ffg.at/projekt/3307471

FFG
Promoting Innovation.

Danubian SMCs

Creative Danube: Innovative teaching for inclusive development in small and medium-sized Danubian cities

Credit: Michaela Harmanescu

Danubian SMCs builds upon the cooperation established within the Interreg project DANUrB and aims to bring together students and teachers from various universities along the Danube. The project facilitates the exchange of skills and expertise in various cities and develops a common framework to assess, analyse and plan small and medium-sized cities from Germany to Romania.

A key premise behind the project is that by applying novel and creative teaching approaches, it is possible to establish a common perspective in dealing with the heterogeneity of cities along the Danube. The project facilitates the development of mutual data acquisition, analysis and visualisation frameworks, an exchange on the similar and different challenges cities face in different regions along the river, and a platform for new perspectivesand approaches to tacklethese matters.

The project consortium – led by the Ion Mincu University of Architecture and Urbanism – is developing three Intellectual Outputs as guidelines focussing on innovative and creative teaching methods, data collection and assessment and assessing the inclusive development of Danubian small and medium-sized cities.

During the course of the project, the partner universities and are organising various intensive programmes for students and teachers in their cities. The Simlab set up the course "Sensing and Mapping the City", focusing on innovative data acquisition techniquies. Student project results can be accessed on the following webpage:

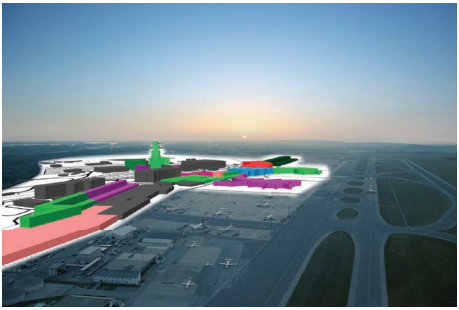
danubiansmcs.project.tuwien.ac.at

Project duration	10/2019 - 08/2022
Funded by	Erasmus+ Grant Programme of the European Union
Lead partner	"Ion Mincu" University of Architecture and Urbanism, Faculty of Urban Planning, Bucharest
Project website	danubian-smcs.uauim.ro

DANUBIAN SMALL & MEDIUM CITIES

With the support of the Erasmus+ Programme of the European Union

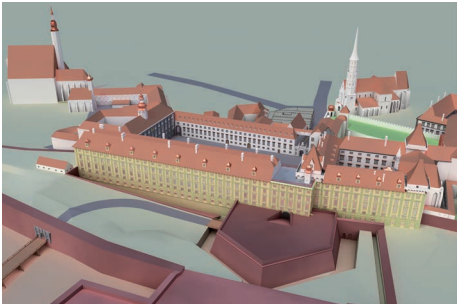
Virtual Airport City Vienna



In order to sustainably reduce the energy consumption of Vienna Airport, a simulation model was created to transform the airport city (~100 properties, ~20,000 employees) into a virtual model city. The interactive 3D visualisation model controlling the simulations was developed in the Simlab and serves as a basis for strategic decision-making.

Project duration	2017 - 2019
Funded by	Mission-oriented research financed by Vienna International Airport
Lead partner	TU Wien - Institute of Building Construction and Technology
Project website	https://url.tuwien.at/equac

Vienna Hofburg 3D digital model



Credit: Herbert Wittine

The Simlab developed an interactive 3D model of Vienna's Hofburg Palace from the mediaeval period to modern times as a dynamic visualisation tool to make findings in the field of art history available for use in humanities and technological research. The project is intended as a contribution to the development of the digital humanities.

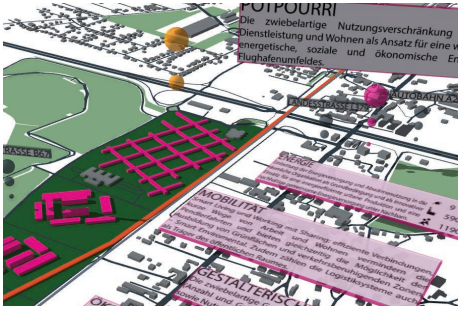
Project duration	2017 - 2019
Funded by	ÖAW (Austrian Academy of Sciences) under the "go!digital" programme
Lead partner	IKM – Institute for History of Art and Musicology (ÖAW)
Project website	https://www.oeaw.ac.at/ihb/forschungsbereiche/kunstgeschichte/forschung/architektur-repraesentation-und-staedtische-oeffentlichkeit/wiener-hofburg-3d-quellenspeicher

DANUrB

The aim of the project was the development of innovative, sustainable cultural and tourism strategies to generate valuable economic and social impacts for the Danube region and preserve its cultural heritage. TU Wien elaborated suitable spatial and regional planning and research methods. The key issue was the transferability of planning processes and potential solutions across the Danube region.

Project duration	2017 - 2019
Funded by	Interreg Danube Transnational Programme
Lead partner	BME Budapest
Project website	danurb.eu

Smart AIRea



Graz Airport and its surroundings have been transformed into a transparent, interconnected, controllable and resilient location – the so-called SmartAIRea, where the key emphasis is on sustainable design and a space planned around people and their needs. Modelling and simulation are essential tools, providing a basis for communication that allows all the necessary stakeholders to be brought together around one table.

Project duration	10/2016 - 12/2017
Funded by	Climate and Energy Fund, implemented under the SMART CITIES - FIT for SET program of the Austrian Research Promotion Agency (FFG).
Lead partner	Joanneum Research Graz | LIFE
Project website	smartairea.project.tuwien.ac.at

Cyber Blackout Scenario

This project simulated the short-term outage of energy supply infrastructures and data connections. An interactive spatial dashboard was developed to allow simulation visualisation and model the control parameters for each scenario to allow iterative development of action plans.

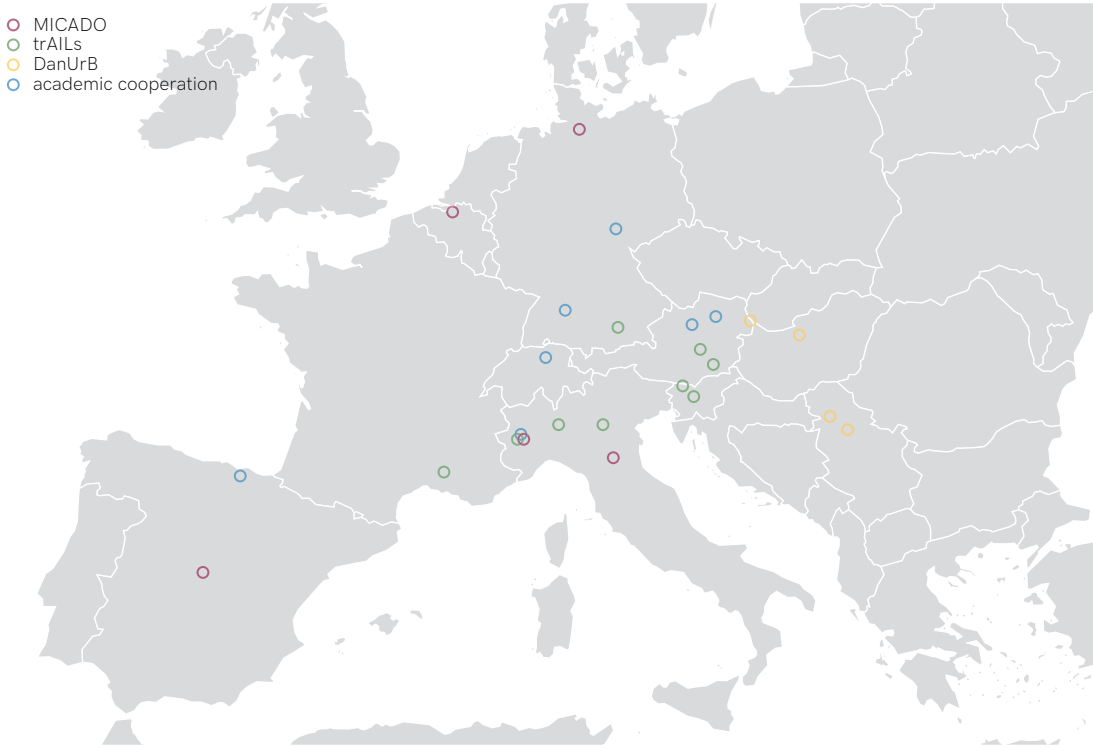
Project duration	03/2017 - 07/2018
Funded by	Austrian Armed Forces
Lead partner	TU Wien - Institute of Building Construction and Technology
Project website	https://www.bundesheer.at/cms/artikel.php?ID=8943

Simultan

The project set up an interdisciplinary cooperation platform within a software environment to deal with building data sets. The digital environment permitted simulation of building physics, allowing analysis and optimization of building components with a view to resource-aware development of highly efficient urban quarters.

Project duration	10/2014 - 09/2019
Funded by	Austrian Research Promotion Agency (FFG)
Lead partner	TU Wien - Institute of Building Construction and Technology
Project website	https://nachhaltigwirtschaften.at/en/sdz/projects/simultan-simultaneous-planning-environment-for-buildings-in-resilient-highly-energy-efficient-and-resource-efficient-districts.php

Research Partners (selection)



Within the framework of national and international research projects, the Simlab has been able to establish contacts with various partners at universities, institutions and companies. These cooperations provide an opportunity to contribute and expand our expertise in data processing and other technologies. The Simlab team enjoy working in an international context as it allows us to grow with the challenges.

Organisation	Project
Austrian Academy of Sciences	Hofburg
Austrian Armed Forces	Blackout
Budapest University of Technology and Economics	DanUrB, Danubian_SMCs
City of Antwerp	MICADO
City of Bologna	MICADO
City of Madrid	MICADO
Colpolsoc	MICADO
CSI Piemonte	MICADO
Danube University Krems	DanUrB, Danubian_SMCs
Energie Steiermark	Smart AIRea
ETH Zürich	academic cooperation
Free and Hanseatic City of Hamburg	MICADO
HCU Hamburg	academic cooperation
Joanneum Research	Smart AIRea
LINKS foundation	academic cooperation
Logistikum (FH OOE)	academic cooperation
Politecnico di Milano	trAILs

Organisation	Project
Politecnico di Torino	academic cooperation
RISC Software	academic cooperation
STU Bratislava	DanUrB, Danubian_SMCs
Studio for Information Design	M-DAB
Technion Haifa	academic cooperation
TU Munich	trAILs
UAUIM Bucharest	DanUrB, Danubian_SMCs
Universidad Rey Juan Carlos	MICADO
University of Antwerp	MICADO
University of Belgrade	DanUrB, Danubian_SMCs
University of Bologna	MICADO
University of Deusto	academic cooperation
University of Ljubljana	trAILs
University of Novi Sad	DanUrB, Danubian_SMCs
University of Verona	trAILs
Vienna International Airport	Virtual Airport City Vienna
Wiener Stadtwerke	Urbem, Simultan
Y Verkehrsplanung	academic cooperation

Teaching

The Simlab focuses on the facilitation of design courses for students from the degree programmes in architecture and spatial planning.

The students work on multiscale project designs in interdisciplinary planning teams, an approach which breaks down the strict separation of disciplines and allows them to address multiple different planning phases. The need for holistic planning processes within defined parameters encourages students to develop ideas for sustainable development of our built environment.

The design course topics are mostly connected to ongoing research activities, so the projects are based on concrete analysis and data and students have direct contact to local practitioners and stakeholders. The table on the following page illustrates the wide variety of courses the Simlab team have offered in recent semesters.

The Simlab team with students on a field trip to the surroundings of the Tullnerfeld railway station in Lower Austria

Title	Description	Semester
Recovering - Designing new Stabilities	Within this interdisciplinary course, students of architecture and spatial planning worked on developing and designing visions for the former industrial site of Münichtal in Eisenerz. The course was linked to the "trAILs" project, with its results being presented at the town's Rostfest cultural festival in summer 2019.	Summer term 2019
Pack it Up!	Trans-European railway infrastructure development not only affects major cities, but also the regions in between.The project Pack it Up! was aimed at spatial planning and architecture students, who developed designs for areas surrounding newly-built railway stations in Tullnerfeld and Lavanttal, addressing the potentials provided by high-ranking rail infrastructure while preserving existing spatial structures and heritage.	Summer term 2020
Spatial Planning Support Systems	This recurring course offers an introduction to parametric modelling techniques within the context of spatial planning. Participating students learn the principles of script- and parameter-based spatial planning processes, with a focus not only on coding skills but also on logical and spatial thinking and their effective implementation in concrete planning processes.	Winter term 2019 and ongoing
Dynamic Border Landscapes in Europe: Borderline City	In the last decades, European integration processes have affected cities and communities in border regions. This course reflected specific challenges spatial planning needs to deal with in such contexts and assessed different examples and topics, such as tourism development, traffic management and temporary migrant accommodation.	Summer term 2020
Sensing and mapping the city	Advances in technology are allowing spatial planners and architects to exploit a diverse range of data sources, as well as analytical and visualisation methods. The course provides an overview of novel, innovative and creative data acquisition technologies and reflects their applicability within various planning contexts. This course has been offered in cooperation with various foreign partner universities within the framework of the Danubian SMCs project.	Winter term 2020
Diploma theses	In addition to the courses described above, the Simlab team offers consultation and supervision of various diploma theses, dealing with novel tools and methods in spatial planning, visualisation or topics related to the ongoing research projects of the team members.	Ongoing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Equipment

The Simlab is designed to support planning processes involving interdisciplinary cooperation, using specially developed digital applications that allow visual presentation of domain-specific information. The effects of different development scenarios and designs are visualised simultaneously via multi-touch monitors, showing the effects over time with parallel presentation of pictorial, numeric and spatial information.

Head-mounted displays allow immersive spatial views and interaction within a virtual design, while a back-projection wall is available to share the immersive views with groups of up to 30 stakeholders. For flexible application and use of the VR technologies, both stationary and mobile set-ups are available. The transportable set up provides agile options for inclusion and engagement of local stakeholders and citizens and cooperation among the various groups.

When programming and applying software solutions, the Simlab relies on open source technologies to ensure optimum combination of knowledge and tools for research and teaching. Associated software environments are adapted for planning purposes and provide options for continuous further development.

360° panoramic recording has been installed for analytical purposes and is used in a number of research and teaching activities at the Simlab. In combination with HMD (HTC VIVE), this allows virtual walkthroughs and impressive visualisations of remote locations as an indispensable support tool to supplement field investigations.

Ongoing research projects and teaching activities are triggers for the development of new applications and ways of implementing the tools. At the same time, they act as test scenarios for an iterative process of improvement and drive new deployments.


Google Earth VR

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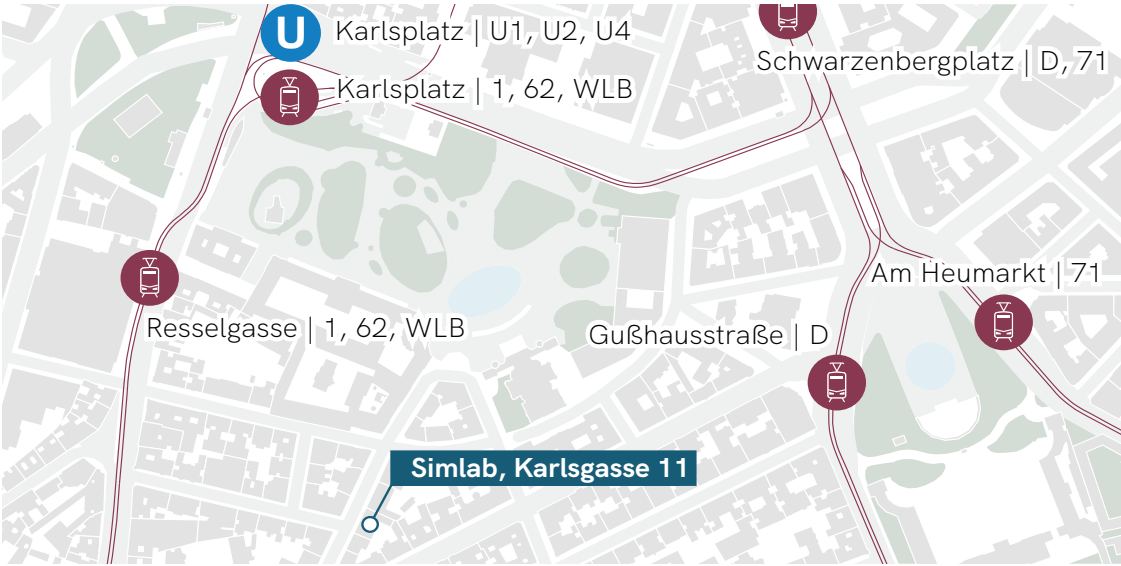

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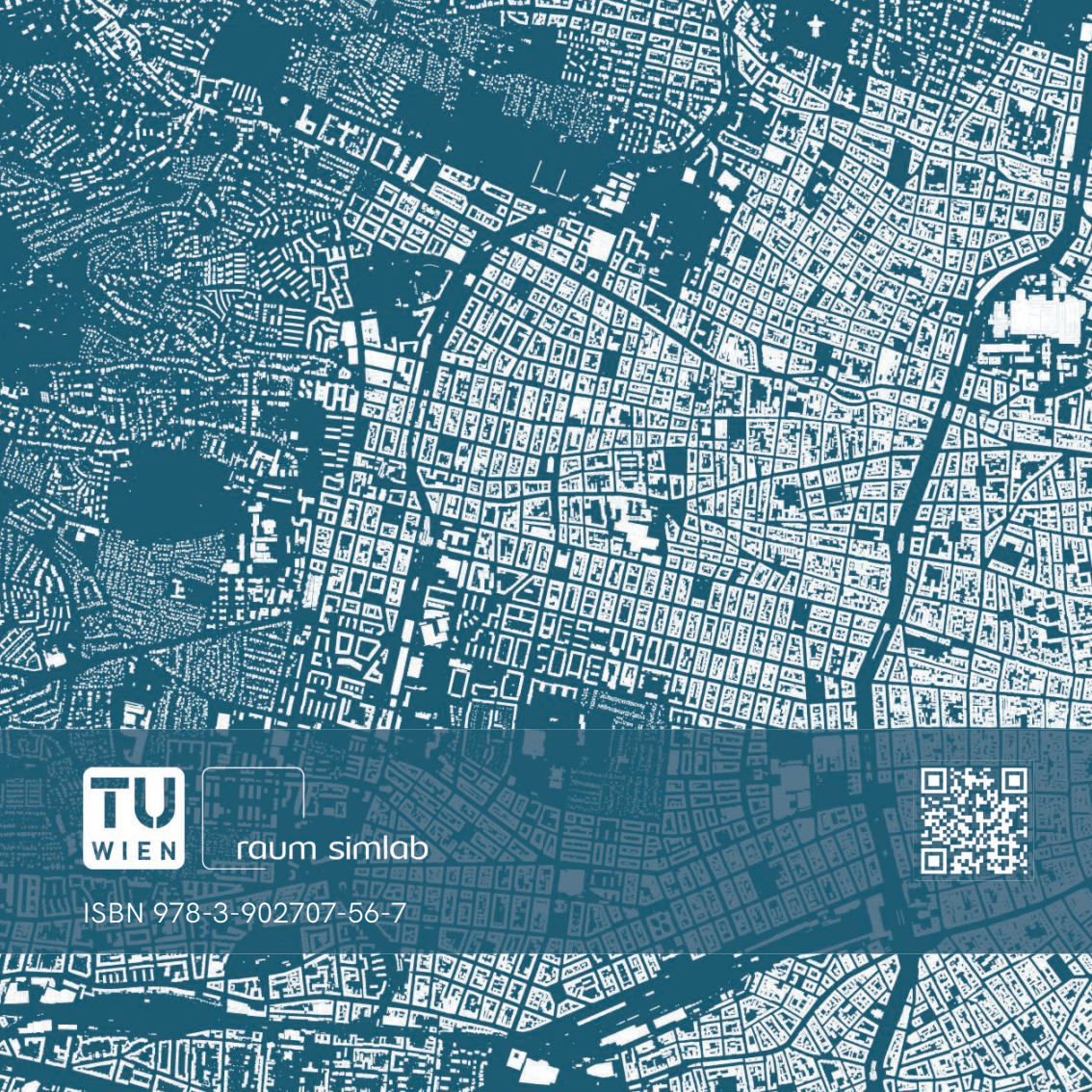

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