



# Preface

Dear Members and Partners

Dear Ladies and Gentlemen

The Smart Living Lab - interdisciplinary, cross-institutional research and development centre in Fribourg - is approaching its 5<sup>th</sup> anniversary. This unique centre combines cutting-edge research and real-life experimentation in multiple research areas, such as construction technologies, well-being and behaviours, interactions and design processes, and energy systems.

Each year the Smart Living Lab brings forth new and exciting projects which have a decisive influence on our future living space. More than 80 researchers from 3 different institutions (EPFL, School of Engineering and Architecture Fribourg HEIA-FR and the University of Fribourg) gather around 11 research groups and pool their know-how every day to create a tangible impact for the future built environment. An important aspect of this teamwork is the cooperation with international universities, specialists and experts, but also the cooperation with local, national and international businesses.

We are delighted to announce the imminent launch of a very important project. The Smart Living Lab is about to break ground on its blueFACTORY site and start building its very own building. Set for completion in 2023 this building will be available to researchers and interested parties alike, to undertake experiments and tests. We will continue to keep you abreast of new developments about the construction process on our Smart Living Lab website.

The activity report provides you with some insights and highlights, as well as some research activities carried out by the three research groups of the University of Fribourg in 2019. We would like to take this opportunity to thank you for the continuous trust you place in us and are looking forward to cooperating with you. With the best regards,

Prof. Dr. Astrid Epiney, Rector of the University of Fribourg, Member Joint Steering Committee  
Prof. Dr. Stephanie Teufel, Smart Living Lab UNIFR Manager, Member Executive Committee



# Research Groups

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The University of Fribourg is showcased through the following three research groups within the Smart Living Lab.

## iimt

The iimt is a leading Swiss competence centre for management in technology and is committed to excellence in continuing education and research. Its research activities focus on analysing changing consumer behaviour, studying socio-technical transitions and transformative processes, as well as energy system management, cybersecurity, innovation, and technology.

## Institute of Swiss and International Construction Law

The Institute of Swiss and International Construction Law is examining the legal aspects of planning, building and operating construction works. At the Smart Living Lab, the Institute focuses in particular on the computerization of design, construction, buildings, and infrastructure, as well as public procurement and conflict prevention and resolution.

## Human-IST

Researchers at the Human-IST Institute are working on human-building interaction. They are developing innovative and sustainable human-centered technologies to understand and improve occupants' interactions with the built environment, as well as enhancing user comfort through data visualization and multimodal interfaces, bringing together expertise from the fields of informatics, psychology, and sociology.

# People

## iimt

■ Prof. Dr. Stephanie Teufel	Professor	01. - 12.2019
■ Dr. Anton Sentic	Senior Researcher	01. - 12.2019
■ Julia Cunha Borba Santos	Junior Researcher	09. - 12.2019
■ Manuel Drazyk	Junior Researcher	01. - 12.2019
■ Martin Grendelmeier	Junior Researcher	06. - 12.2019
■ Yanina Iskakova	Junior Researcher	01. - 06.2019
■ Fabienne Jungo	Junior Researcher	01. - 03.2019
■ Laura Mustafi	Junior Researcher	01. - 10.2019
■ Virgile Pasquier	Research Assistant	09. - 12.2019
■ Kirstin Stadelmann	Team Communication	01. - 12.2019

## Institute of Swiss and International Construction Law

■ Prof. Dr. Martin Beyeler	Professor	01. - 12.2019
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## Human-IST

■ Prof. Dr. Denis Lalanne	Professor	01. - 12.2019
■ Dr. Hamed Alavi	Senior Researcher	01. - 12.2019
■ Dr. Julien Nembrini	Senior Researcher	01. - 12.2019
■ Michel Papinutto	PhD	01. - 12.2019
■ Sailin Zhong	PhD	07. - 12.2019

## University of Fribourg

■ Prof. Dr. Astrid Epiney	Member Joint Steering Committee	01. - 12.2019
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에너지드림센터 Seoul Energy Dream Center

# Highlights

## Swiss-Korean Academic Exchange Programme ARC-HEST

The highlight of the year 2019 has been the first part of the ARC-HEST Workshop in Seoul in August, which involved students and teachers from both Switzerland and South-Korea at the initiative of the Swiss Embassy in Seoul. During 2 intense weeks, students analysed a co-working space over several dimensions such as comfort, lighting, sound, air quality, occupation, human-building interactions, etc. This analysis was the basis for design proposals which were discussed and finally evaluated by the supervising team. Altogether, it constituted a very interesting exchange both for the students and the teaching team.

Members of the iimt and Human-IST team have added their expertise in innovation and transition studies and in human-building interaction respectively to this novel academic exchange programme, organised by six universities – the University of Fribourg, HEIA-FR, and EPFL in Switzerland and Sungkyunkwan University, Ewha Womans University and Hanyang University in Korea – and supported by the Swiss Science and Technology Office in Seoul. In the course of the programme, students and teachers have investigated synergies of architectural design, human factors, and technologies in office buildings and their combined effect on indoor environmental quality and human-building interaction in the context of the local culture and architecture. The first part of the programme was held from August 18<sup>th</sup> to August 30<sup>th</sup> in Seoul, Korea, as a summer school, while the second part will be organised as a winter school in February 2020 in Fribourg.



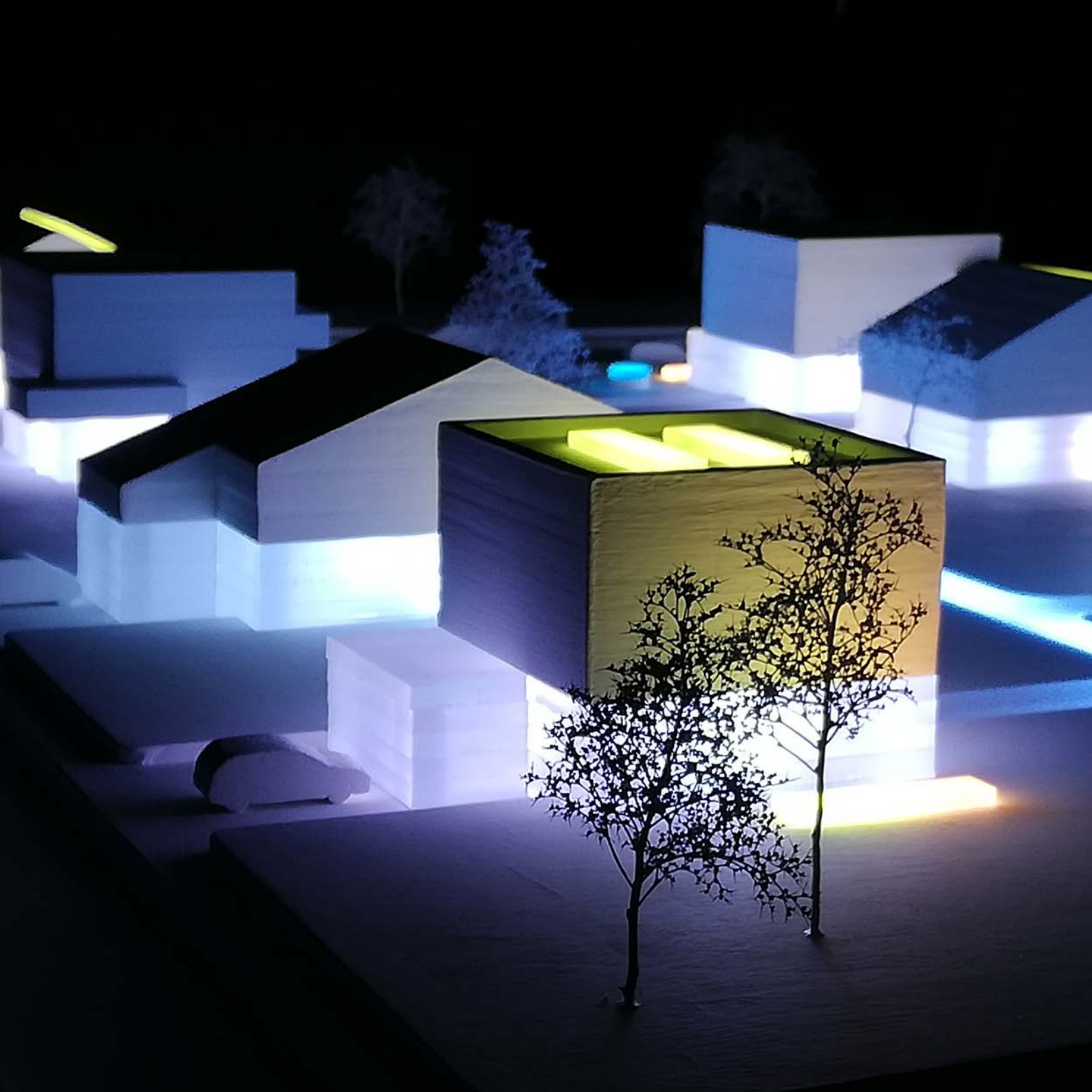
# Highlights

## Additional Highlights

- «The Legal Vacuum» (law X architecture X conceptual art): experimental public room (allegedly) without any law in force, fostering reflexions about the nature and the functions of law.
- "Digitales Bauen, aber Recht !" (law X design and construction): public workshop on new or aggravated legal issues arising in virtual design, construction and operating of construction works.
- "La médiation selon les art. 213 à 218 CPC" (law X amicable dispute resolution): in-depth analysis of (published in : Schweizerische Zeitschrift für Zivilprozess- und Zwangsvollstreckungsrecht [ZZZ] 2019, pp. 292–359).



«The Legal Vacuum» photo by Laure Thorens





# Fields of research

The three University research groups, are active in the following fields of research:



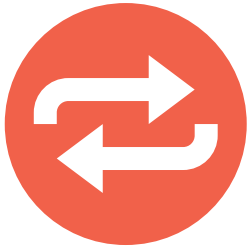
## Well-being and behaviours

Improve human health and comfort by optimizing indoor environmental quality and influencing behaviours in a positive way.



## Energy systems

Develop smart energy-efficient systems and technologies, improve their management, and anticipate legal and economic impacts.



## Interaction and design processes

Understand and structure dialogue among stakeholders in the building lifecycle to develop the tools to design, model and operate buildings.



## Construction technologies

Monitor resource efficiency and accelerate processes of change in construction.

# Research projects

iimt

Name of the project	Project member(s)	Starting date	End date	Description	In cooperation with
SATIN - System analysis tool for socio-spatial innovation networks	Anton Sentic, Virgile Pasquier, Florinel Radu, Jonathan Parrat, Julie Runser,	01/2019	09/2019	In the project SATIN the researchers are investigating ties between collaboration and communication social networks and the spatial location of researchers working in the Smart Living Lab. By combining social network analysis methods, spatial mapping of the Halle Bleue building and observation of different characteristics of work and meeting spaces, the research team is aiming to take the first steps towards developing a novel research approach.	UniFR iimt, HEIA-FR TRANSFORM
Interactive simulation of a crowd energy system	Anton Sentic, Manuel Drazek  (Christian Ritzel, Joëlle Simonet, Jonathan Parrat, Ilse Bahnsen Morales, Joëlle Rudaz, Andeol Demierre)	12/2019  (03/2018- 02/2019)	ongoing	The project explores the behaviour of prospective users in decentralised, prosumer-based energy systems (Crowd Energy) by simulating energy investment and trading on an interactive physical model of an energy neighbourhood supported by an IT interface. Besides gathering data on prosumer behaviour, the model has a secondary function of acting as an exhibition piece, providing information on energy crowds and bolstering discussion on decentralised energy systems. In the second, current project phase, the iimt team is expanding the model's software in order to develop a more complex version of the Crowd Energy simulation. This version will be utilised both in the exhibition/ information function and as a data gathering tool.	UniFR iimt, HEIA-FR TRANSFORM, HEIA-FR ROSAS
Decision support for an efficient and sustainable waste collection	Reinhard Bürgy, Bernhard Ries, Anton Sentic, Virgile Pasquier, Vera Fischer, Manuel Wyss	09/2019	ongoing	The aim of the project is to develop a decision support tool for municipal waste management systems based on optimisation modelling and the deployment of innovative technologies; focusing on efficiency and sustainability improvements. The role of the iimt is to create an innovation support process bolstering uptake and diffusion of waste management innovation in Swiss municipalities; with the process being based on insights from Transition Studies.	UniFR iimt, UniFR DS&OR; Schwendemann AG

# Research projects

iimt

Name of the project	Project member(s)	Starting date	End date	Description	In cooperation with
Blockchain Energy	Anton Sentic, Bernd Teufel, Mathias Barmet, Tim Niemer, Kristina Hojckova	02/2019	ongoing	The project examines the ongoing, far-reaching transformation of the electricity sector towards an increased use of alternative, renewable energy sources, going beyond a simple decentralization of the electricity market. The transformation process is characterized by an interplay of old and new technologies from the energy sector as well as structural coupling with other sectors, such as ICT, enabling technology transfer as well as market entry by IT actors. Blockchain-based technologies have the potential to play a key role in this transition by offering decentralized interfaces and systems as well as alternative configurations for the energy market. The project focuses on a number of key areas: applicability and practical implementation of blockchain-based technologies in the energy sector, utilization of blockchain in various elements of the energy systems such as trading, information storage and increased transparency and democratization. A Transition Studies perspective is utilized to review potential barriers for the further development and diffusion of blockchain energy, as well as to map out prospective transition trajectories. The main output is planned to be a series of scientific papers, focusing on one or more of the core research areas outlined above.	UniFR iimt, Chalmers University of Technology, Göteborg, Sweden



# Research projects

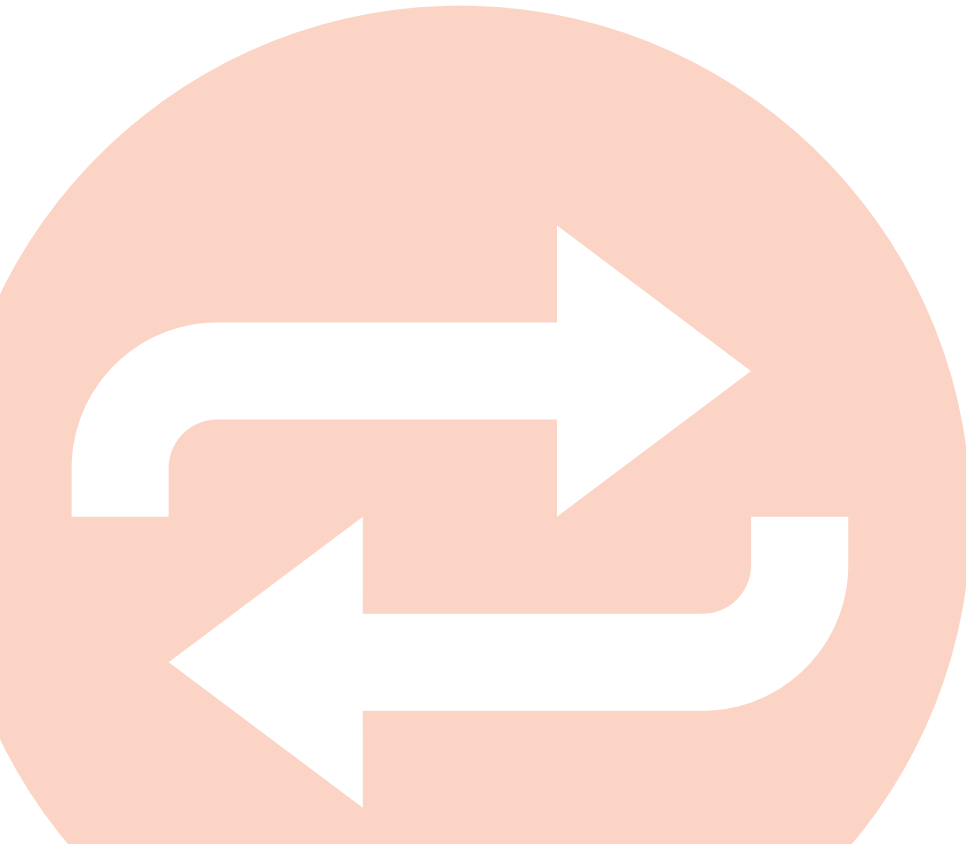
## Institute of Swiss and International Construction Law

Name of the project	Project member(s)	Starting date	End date	Description	In cooperation with
Vergaberechtliche Urteile 2018/2019	Beyeler Martin	2019	2020	Complete and in-depth analysis of all court decisions (Swiss courts and European Court) about public procurement law from the years 2018 and 2019; publication of a book about the commented results (2020).	
La médiation selon les art. 213 à 218 CPC	Beyeler Martin	2018	2019	In-depth analysis of and commentary on the Swiss Civil Procedure Code provisions on mediation (articles 213 to 218 S-CPC); publication of an article (ZZZ 2019, pp. 292–359)	
Commentaire des art. 81, 81a, 82 et 88 Cst.	Beyeler Martin Diebold Nicolas (UNI-LU) Ludin Martin (UNI-LU)	2018	2020	In-depth analysis of and commentary on the Swiss Federal Constitution provisions on (some) infrastructure works (public works of national interest; public transport; public roads; footways, hiking paths and cycleways); publication (planned for 2020) within the “Commentaire Romand Cst.”	
Wettbewerbsneutralität bei der kommerziellen Sondernutzung öffentlicher Sachen	Beyeler Martin	2019	2020	In-depth analysis of and commentary on the Swiss federal administrative court decision B-6872/2017 (of 16 <sup>th</sup> May 2018) about the commercial use (lease) of public assets; publication 2020 (Boillet/Favre/Martenet [eds.], Le droit public en mouvement, Zurich 2020, pp. 469 seq.).	
Finanzvermögen: Freiheit oder Vergaberecht?	Beyeler Martin	2019	2019	In-depth analysis of public procurement law coverage issues pertaining to non-bound public assets (“Finanzvermögen”); publication (Kriterium Nr. 45/2019; <a href="https://bd.zh.ch/internet/baudirektion/de/themen/oeffentliche_beschaffung/hilfsmittel_vorlagen/kriterium/_jcr_content/contentPar/downloadlist_5/downloaditems/kriterium_nr_45.spooler.download.1548318191337.pdf/GS_Kriterium_45_WEB.pdf">https://bd.zh.ch/internet/baudirektion/de/themen/oeffentliche_beschaffung/hilfsmittel_vorlagen/kriterium/_jcr_content/contentPar/downloadlist_5/downloaditems/kriterium_nr_45.spooler.download.1548318191337.pdf/GS_Kriterium_45_WEB.pdf</a> )	
Computergestütztes Planen, Bauen und Betreiben als Gegenstand des Planervertrags	Beyeler Martin	2018	2019	In-depth analysis of contractual issues arising from the use of computers in design, construction and operation of construction works ; publication in: Stöckli/Siegenthaler (eds.), Die Planerverträge, 2 <sup>nd</sup> ed., Zurich 2019	

# Research projects

## Human-IST

Name of the project	Project member(s)	Starting date	End date	Description	In cooperation with
Well-being in offices through establishing predictive models of comfort	Alavi Hamed, Zhong Sailin, Lalanne Denis	11.2018	ongoing	We examine a novel approach to address the problem of comfort decay in shared office spaces in which predictive natural net models are used to forecast the evolution of indoor environmental qualities.	Logitech
MUBI: mobile user-building interface	Illic Aleksandar, Nembrini Julien	03.2018	03.2019	Prototype mobile application for involving users with the building database BBData through data visualization and feedback submission	



# HUMAN-CENTRIC BUILT ENVIRONMENT

Isolation

individual

Not to harm  
other species  
because we are  
part of ecosystem

interact  
with  
surroundings

COOPERATION

friendly

easy approach  
(location)

easy to  
use

easy to  
use / understand

Human needs

human scale

fulfilling the needs  
of occupants  
in a healthy &  
sustainable way



# Publications

## Publications

Alavi, H. S.; et al. «Introduction to Human-Building Interaction (HBI) Interfacing HCI with Architecture and Urban Design.» (2019): 1-10. (Journal)

Alavi, H. S.; Himanshu, V.; Jakub, M.; Lalanne, D. «On the temporality of adaptive built environments.» People, Personal Data and the Built Environment, pp. 13-40. Springer, Cham, 2019. (Book Chapter)

Alavi, H. S.; Farzaneh, B. «Walking in smart cities.» Journal of Interactions 26, no. 2 (2019): 66-68. (Article)

Alavi, H.; Churchill, E.; Wiberg, M.; Lalanne, D.; Dalsgaard, P.; Rogers, Y. «Human-building interaction: Sketches and grounds for a research program.» Journal of Interactions 26, no. 4 (2019): 58-61. (Article)

Alavi, H. S.; Lalanne, D. "Interfacing AI with Social Sciences: the Call for a New Research Focus in HCI". INTERACT2019, Workshop on Humans in the Loop - Bringing AI & HCI Together. (Conference Paper)

Beyeler, M. La mediation selon les art. 213 à 218 CPC, in: ZZZ 2019, pp. 292 seq. (Article)

Beyeler, M. Finanzvermögen: Freiheit oder Vergaberecht?, in: Kriterium Nr. 45/2019. (Article)

Beyeler, M. Computergestütztes Planen, Bauen und Betreiben als Gegenstand des Planervertrags, in: Stöckli/Siegenthaler (eds.), Die Planerverträge, 2<sup>nd</sup> ed., Zurich 2019. (Book Chapter)

Beyeler, M. Bemerkungen zum Urteil des Verwaltungsgerichts des Kantons Bern vom 18. Dezember 2018 (VGE 100.2018.326, BVR 2019 S. 201 ff.), in: BVR 2019, S. 210 ff. (Article)

# Publications

## Publications

Beyeler, M. Various reports of/comments on court decisions in public procurement (Baurecht / Droit de la construction 2019). (Article)

Can, L.; Alavi, H.S.; Costanza, E.; Zhai, S.; Mackay, W. E.; Moncur, W. «Rigor, Relevance and Impact: The Tensions and Trade-Offs Between Research in the Lab and in the Wild.» CHI Conference on Human Factors in Computing Systems, 2019. Extended Abstract. (Conference Paper)

Fossum, K.; Binder, J.; Madsen, T.; Aarseth, W.; Andersen, B. «Success factors in global project management: A study of practices in organizational support and the effects on cost and schedule». International Journal of Managing Projects in Business, 2019. (Journal)

Hyelip, L.; Je, S.; Kim, R.; Himanshu, V.; Alavi, H.; Bianchi A. «Partitioning open-plan workspaces via augmented reality.» Journal of Personal and Ubiquitous Computing (2019): 1-16. (Journal)

Nembrini, J.; Kämpf, J. H.; Pappinutto, M.; Lalanne, D. (2019). A smart luminaire in an office environment: Impact on light distribution, user interactions and comfort. Journal of Physics: Conference Series, 1343, 012164. (Conference Paper)

Nembrini, J.; Sánchez, R.; Lalanne, D. (2020). Discussing the Potential of BMS Data Mining to Extract Abnormal Building Behaviour Related to Occupants' Usage. In C. Gengnagel, O. Baverel, J. Burry, M. Ramsgaard Thomsen, & S. Weinzierl (Eds.), Impact: Design With All Senses (pp. 727–736). Springer International Publishing. (Conference Paper)

Schilli, L.; Gstrein, M.; Jurt J.; Teufel S.; Blanc, M. How to manage crowdsourcing projects: an example of independent verification of methods and data in a R&D environment. PM Congress 2019 - Research meets Practice, Delft, 2019. (Conference Paper)

Sentic, A. Conceptualising living labs as innovation niches in transition processes: Insights on expectations, visions and structure-building from a Swiss case study. 4th NEST Conference, NOVA University Lisbon, April 4<sup>th</sup>-5<sup>th</sup> 2019. (Presentation/Talk)

Sentic, A.; Iskhakova, Y. Living Labs as Co-Creation Spaces between Academia, Industry and the Public: Insights from two Swiss Case Studies. 18<sup>th</sup> Annual STS Conference Graz 2019, Graz, May 6<sup>th</sup>-7<sup>th</sup> 2019. (Conference Paper)

# Publications

## Publications

Sentic, A.; Iskhakova, Y. Living labs as proto-niches in transition processes: Insights on expectations, knowledge management and structure building from two Swiss case studies. 2019 IST Conference, Carleton University, Ottawa, Canada, June 23<sup>rd</sup>-26<sup>th</sup> 2019. (Conference Paper)

Simonet, J.; Teufel, S. The Influence of Organizational, Social and Personal Factors on Cybersecurity Awareness and Behavior of Home Computer Users. IFIP Sec 2019, Lisbon, 2019. (Conference Paper)

Siân L.; Raval, N.; Alavi, H.S.; Lindtner S.; Wang D. «The Future of Work.» CHI Conference on Human Factors in Computing Systems. 2019. Extended Abstract. (Conference Paper)

Stadelmann, K. Crowd-Energy - a human-powered paradigm shift. Swiss-US Energy Innovation Days (SUEID), October 6<sup>th</sup> - 9<sup>th</sup>, Austin and San Antonio, Texas, 2019. (Presentation/Talk)

Teufel, B.; Sentic, A.; Barmet, M. «Blockchain Energy: Blockchain in Future Energy Systems». Journal of Electronic Science and Technology. 2019, vol 17, no. 4. (Journal)

Teufel, S.; Teufel, B. The Positive Momentum of Crowds for the Implementation of Smart Environments. Proc. International Conference on Social Sciences and Management (ICSSM) 2019, Beijing, China, 2019, pp. 78-88. (Conference Paper)

Van Zyl-Bulitta, V.; Ritzel, C.; Stafford, W.; Wong, J. «A compass to guide through the myriad of sustainable energy transition options across the global North-South divide». Energy. 2019, vol. 181, pp. 307-320. (Journal)





# Conferences

iimt

4<sup>th</sup> NEST Conference, NOVA University Lisbon, April 4<sup>th</sup>-5<sup>th</sup> 2019.

18<sup>th</sup> Annual STS Conference Graz 2019, Graz, May 6<sup>th</sup>-7<sup>th</sup> 2019.

IST Conference, Carleton University, Ottawa, Canada, June 23<sup>rd</sup>-26<sup>th</sup> 2019.

IFIP Sec 2019, Lisbon, 2019.

International Conference on Social Sciences and Management (ICSSM) 2019, Beijing, China, 2019.

PM Congress 2019 - Research meets Practice, Delft, 2019.

Swiss-US Energy Innovation Days (SUEID), October 6<sup>th</sup> - 9<sup>th</sup>, Austin and San Antonio, Texas, 2019.

# Conferences

## Institute of Swiss and International Construction Law

Update on public procurement law (biannual meeting of Swiss administrative judges), 17<sup>th</sup> May 2019, Murten

"Digitales Bauen, aber Recht !": public workshop on new or aggravated legal issues arising in virtual design, construction and operating of construction works, 3<sup>rd</sup> September 2019, Olten

"Forum Neues Vergaberecht", 10<sup>th</sup> September 2019, Basel

"ALUMNI IUS FRILEX", 13<sup>th</sup> September 2019 (short presentation about public procurement law revision works)

## Human-IST

17th IFIP TC.13 International Conference on Human-Computer Interaction – INTERACT 2019, September 2019, Cyprus.

ACM CHI Conference on Human Factors in Computing Systems CHI 2019, Glasgow, UK

Design Modelling Symposium Berlin 2019, Germany

CISBAT 2019, EPFL, Switzerland

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# Teaching Activities

## iimt

- **Innovation-led transformation of socio-technical system: Strategic Niche Management.** The aim of this course is to provide students with a theoretical understanding of the basic principles and concepts of Transition Studies and, particularly, Strategic Niche Management. As a key element of the course, students should be able to apply these principles in order to analyse and evaluate real-life examples for innovation niches, with the aim of providing practical recommendations to key actors. (Master)
- **Strategisches Projektmanagement:** The aim of this master course is to convey the importance and applicability of theoretical and practical methods in project management. (Master)
- **Swiss-Korean Academic Exchange Programme ARC-HEST:** Members of the iimt team have added their expertise in innovation and transition studies to this novel academic exchange programme, organised by six universities – the University of Fribourg, HEIA-FR, and EPFL in Switzerland and Sungkyunkwan University, Ewha Womans University and Hanyang University in Korea – and supported by the Swiss Science and Technology Office in Seoul. In the course of the programme, students and teachers have investigated synergies of architectural design, human factors, and technologies in office buildings and their combined effect on indoor environmental quality and human-building interaction in the context of the local culture and architecture. The first part of the programme was held from August 18th to August 30th in Seoul, Korea, as a summer school, while the second part will be organised as a winter school in February 2020 in Fribourg. (Bachelor & Master)
- **Fribourg von morgen:** The novel idea of a multidisciplinary course is intended to enable students to combine the acquired knowledge of their studies and of different fields and courses of study and to generate cross-disciplinary solutions in group work. Interdisciplinary teamwork will be practiced, encouraged and actively carried out in the course of the student group work, as the students come from different disciplines and are encouraged to combine and coordinate their knowledge and skills to solve the selected problems. This approach both promotes interdisciplinary competences and strengthens the innovative development potential. (Master)

# Teaching Activities

## Institute of Swiss and International Construction Law

- Lecture “Résolution de conflits dans la construction” (master course; law faculty; University of Fribourg): Prof. Dr. Martin Beyeler
- Seminar about principled negotiation and mediation (law faculty; University of Fribourg); Prof. Dr. Martin Beyeler
- Lectures and seminars about public procurement law (University of Fribourg): Prof. Dr. Martin Beyeler
- Lectures in several CAS/MAS programmes about public procurement law / computerized instruments and results in construction law and other branches of law (UNI-FR / HEIA / FHNW): Prof. Dr. Martin Beyeler

## Human-IST

- ARC-HEST workshop (Prof. Dr. Denis Lalanne and Dr. Julien Nembrini). The Human-IST team participated actively in the teaching with a class on human-building interaction and on the use-cases with the acquisition of occupants’ behaviors and interactions in the various co-working spaces in Seoul and in Switzerland. Original methodologies were developed for this purpose.
- Buildings Data Visualization Seminar I & II, Joint Master in Computer Science Seminar (Prof. Denis Lalanne, Dr. Julien Nembrini)
- Master thesis of Aleksandar Ilic «Improving the comfort assessment feedback rate in office buildings through the mobile app: design and evaluation», Supervision by Prof. Dr. Denis Lalanne and Dr. Julien Nembrini, March 2019





# Student incubator

## A programme for students with great projects

The Smart Living Lab student incubator is a programme, established in cooperation with the Baloise Group, to support unique and future-oriented projects. The programme offers both financial support and expert coaching to its participants in order to provide the best possible assistance for students aiming to turn their project ideas into reality.

The programme is open to all Bachelor, Master or PhD students from one of the Smart Living Lab partner Universities (EPFL, HEIA-FR or UNIFR) with ideas or projects in the field of well-being and behaviors, interaction and design processes, energy systems or construction techniques.

Three projects were selected in 2019. The first one, developed by a student from the HEIA-FR, aims at promoting aquaponics, a soil-less plant growing system using fish feces as fertilizer. The objective of the second one, submitted by two EPFL students, is to conceive a digital quality control system for construction sites. The third project supported by the incubator, submitted by two EPFL students, is a self-sanitising door handle.



«aquaponie» photo by Mandy Juillerat









# Fun Fact

iimt

- Did you know that in South Korea, “fondue-flavoured” snacks actually taste of coconut? The iimt team found out during their visit for the ARC-HEST exchange programme, and we dearly hope that our Korean partners aren’t in for a major surprise once they visit us in February 2020.







# Commissions

## iimt

- Comité Directeur Smart Living Lab, Prof. Dr. Stephanie Teufel
- Scientific Commission Smart Living Lab, Prof. Dr. Stephanie Teufel
- Scientific Commission Smart Living Lab, Dr. Anton Sentic
- Team Communication Smart Living Lab, Kirstin Stadelmann
- Commission de construction Smart Living Lab, Prof. Dr. Stephanie Teufel

## Institute of Swiss and International Construction Law

- Scientific Commission Smart Living Lab, Prof. Dr. Martin Beyeler
- Observer at the SIA-Begleitkommission 442 (SIA-BK 442; transposition of ISO Standards about virtual design, construction and operation of construction works), Prof. Dr. Martin Beyeler

## Human-IST

- Scientific Commission Smart Living Lab, Prof. Dr. Denis Lalanne
- Editorial Board of Adaptive Environments Springer Series (Dr. Hamed S. Alavi)
- International Network of Networks for Well-being in The Built Environment (IN2WIBE).
- Member of the International Energy Agency Task 61 SHC (Dr. Julien Nembrini)
- Commission fédérale de la consommation CFC (Prof. Dr. Denis Lalanne)

## University of Fribourg

- Joint Steering Committee, Prof. Dr. Astrid Epiney

# Outlook 2020

## iimt

2020 is bound to become a very active year for the iimt at the Smart Living Lab: research and collaboration will be combined by teaching and international academic collaboration. Regarding the former, iimt researchers will continue their work on the interactive simulation of a crowd energy system and decision support for an efficient and sustainable waste collection projects, the second of which is going into its “hot” phase following the official project start and initial activities in the autumn of 2019. Inside the lab, further collaborations will be explored with colleagues from the TRANSFORM and FAR groups, while there is also a planned collaboration with Groupe E on energy research on decentralised systems. In terms of teaching, both spring term and autumn term will include iimt-led courses on innovation, transition studies and project management, with the autumn term also including the second implementation of the experimental interdisciplinary course Freiburg von morgen. February 2020 will be particularly interesting, as the SLL will host the second part of the ARC-HEST Swiss-Korean academic exchange programme in form of a winter school. Within the programme, the iimt will offer additional training on innovation studies, focusing particularly on user personas and user behaviour, while Dr. Anton Sentic will also take the role of academic coordinator of the winter school programme. Lastly, but no less important than the other planned activities, members of the iimt have started packing their luggage for the year’s conference season: contributions in the form of presentations, papers and workshops have been accepted for various national and international conferences taking place halfway across the continent: from Zürich and Vienna to Bangkok.

## Human-IST

Several research collaborations will take place within the SmartLivingLab with the TEBEL lab and outside with Idiap (EPFL) and industrial partners will be initiated thanks to multiple sources of funding such as Innosuisse, SNF, OFEN-BFE, etc. The ARC-HEST workshop will also continue in 2020, early 2020 this time in Fribourg with the South Korean participants exploring new case studies of co-working spaces, and later in the year with a book and a novel edition of the program.



[www.unifr.ch](http://www.unifr.ch)



smart  
living  
lab

