



Educating Responsible Engineers

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Welcome from SEFI

Dear Participants of the 52nd SEFI Annual Conference, in the name of the European Society for Engineering Education, I warmly welcome you to Lausanne to the 2024 SEFI annual grand meeting devoted to the education of responsible engineers.

The global landscape is stirred up and this involves all aspects of our life. The new challenges induce major evolutionary changes for both human (slow) and machine (really fast) and require the transformation of teaching, especially within engineering, the technological driving force with an important role in aligning these evolutionary paths.

We, engineering educators, have major tasks and principal responsibility in the transition towards new discoveries and at times unprecedented territories within education.

How can we efficiently and benevolently apply generative artificial intelligence, large language models and machine learning into education and research?

How can we update and upgrade our pedagogical approach towards transversal skills on sustainability, diversity, ethics and core technical skills?

Is the gradual development of teaching the right way forward, or should we venture into fundamental transformations?

Anyhow, we may need to speed up, as technological development will not slow down.

The educational methods and tools that we develop define not only our present and future but also the attitude and motivation of our graduates and university colleagues.

Therefore, it is vital that platforms such as the SEFI annual conference provide an open space to discuss and conclude on the shared understanding of our duties and responsibilities in engineering and its education.

With its workshops, research and practice presentations, symposia, keynotes and panel discussions the 2024 SEFI conference at EPFL will provide us with the opportunity to analyze current challenges, allows us to personally meet our peers and foster impactful dialogues to jointly generate the future of engineering education.

Let us use these days together to foster fruitful discussions and find common solutions!

**Balázs Vince Nagy,
SEFI President**



Welcome from EPFL

To professors, lecturers, students, researchers, and engineering education leaders from across Europe and the world: we are delighted to welcome you to EPFL, Switzerland for the 52nd SEFI Annual Conference.

EPFL is pleased to host this SEFI conference with the theme 'Educating Responsible Engineers'. 'Responsibility' has been a key theme for EPFL in recent years as we have sought to ensure that, in our research, our teaching, and in our operations, we embody a sense of responsibility.

As the person who bore overall responsibility for our education programmes over recent years, that has meant that I have worked with my colleagues to ensure that respect and sustainability are at the heart of our education offer. This has seen the restructuring of our first year programme with the introduction of a new mandatory course in sustainability science for all our students. Later years of our

programmes have also been restructured to ensure that at both Bachelor's and Master's level, students will learn the sustainability practices and knowledge that will enable them to research, innovate, design and implement engineering solutions that are ethical and environmentally responsible.

As an education researcher as well as a computer scientist, I recognise that such transformations need to be supported by educational research. EPFL has long been a national and international leader in research on Digital Education with a particular focus on computer human interaction in learning, on learning with robots, and on machine learning in education. Our commitment to world-class research in this area led to the establishment of the Joint EPFL-ETHZ Doctoral Programme in the Learning Sciences (JDPLS), and to us bringing the relevant labs together in our Center for Learning Sciences (LEARN). Through this Center we work to bring together cutting edge technological education research with professors, school teachers, and pedagogical development teams to drive the development of evidence-informed educational practices,

and practically useful educational research. We see these same synergies of research-informed engineering education innovation in the SEFI community, and that is why we are delighted to host the SEFI 2024 conference in Lausanne.

We hope you get a lot from your stay at our campus. We are rather proud of our location and we hope you find time to enjoy the lake shore, the mountains and the charming city of Lausanne. We hope too that we will learn a few things from you, and that you will learn something from us, and from each other.

I look forward to the opportunity to discuss with you over the course of the conference.

Welcome to **#SEFI2024** at EPFL!

Pierre Dillenbourg,
Vice President Academic Affairs *ad interim*, EPFL





About EPFL

The École Polytechnique Fédérale de Lausanne is one of the world's most dynamic and cosmopolitan engineering universities.

It encompasses five schools, two colleges, 18 research institutes, 428 research labs and chairs, and 78 research groups, bringing together students, faculty and staff from over 120 different countries. Every day, nearly 18,000 people come to our main campus in Lausanne, on the shores of Lake Geneva, to work, study or conduct research.

Our faculty is made up of over 370 professors who teach and perform research. In 2023, 50% of faculty hires were women, and this led to an increase in the proportion of female professors from 23% in 2022 to 25% in 2023.

Our researchers often apply for international grants, including from the EU, to finance their work. As of end-2023 they had received 189 ERC grants from the European Commission. Thirteen of our researchers are among the 1% most cited in their fields worldwide, and

our faculty members publish an average of 13 articles a year. We also stand out in the area of technology transfer. Nearly 100 priority patents are filed under the EPFL name every year, and one EPFL spin-off is created every two weeks based on EPFL technology or by our School's researchers (21 in 2023).

Sustainability in education

In 2022, a "Teach4Sustainability" working group was set up to give our graduates knowledge about sustainability and capacity to act within complex systems, in addition to their field-specific skills.

This working group has been tasked with expanding and broadening our range of our sustainability classes in the coming years – a request we frequently received from our students.

A new mandatory course on sustainability will be introduced in 2025 for all bachelor students. The pilot started in Spring 2024. In addition, all the study plans are mandated to

include core-courses linking sustainability to field-specific challenges.

Equality and diversity

Equal opportunities are an integral part of EPFL's development and excellence policy.

In December 2021, the EPFL Presidency adopted the Equal Opportunity & Diversity Action Plan 2021-24. The Action Plan represents a roadmap that articulates a strategic vision, with objectives and dedicated measures, engaging the EPFL Direction, Schools and units.

In 2023, an Equal Opportunity and Diversity Committee was appointed with the aim to

- Discuss EDI topics, indicators, EPFL wide initiatives & strategy.
- Invite experts and promote benchlearning on EDI with leading universities.
- Support exchange of good practice developed at EPFL schools & sections

Planned actions for 2021-24 include:

- Increase the number of women professors
- Ensure appropriate gender equality among faculty hired directly
- Introduce a dual-career program
- Increase our commitment to excellence and diversity by introducing a visiting professor and academic guest program

Key figures

13'445 students

500+ labs, chairs and research groups

2,290 courses in total

135 courses with a focus on sustainability

44 courses with a focus on ethics



DEI & Sustainability at the heart of SEFI 2024

Building a socially and environmentally sustainable society is intrinsically linked to the work of engineers and scientists.

As UNESCO has noted, each and every one of the Sustainable Development Goals (SDGs) requires solutions which are rooted in science, technology and engineering.

But there is a concern too that engineering is not only part of the solution but also part of the problem: for many engineers, their work is contributing to carbon emissions, unsustainable resource use, biodiversity and habitat loss, and to pollution.

There are equally concerns about engineers' responsibilities in warfare and violence across the globe, and in new, technologically-enabled vectors for discrimination, impoverishment and inequalities.

A focus on responsibility has also seen a parallel growth in questions about how thinking and feeling interact in engineering: about ex-

citement, anxiety, burnout, compassion, guilt, shame and hope.

Addressing these questions in engineering education is not straightforward: innovative engineering solutions to social and environmental challenges will require the highest levels of technical competence and scientific knowledge.

But the centrality of technical knowledge to engineering education can create in students the impression that responsibility is a marginal concern for them.

Building a sustainable society means educating scientists and engineers that can apply the best scientific knowledge with ingenuity, with ethical competence and with respect for colleagues, for those in wider society and for the natural environment.

It therefore needs to integrate social and human sciences as part of their education.

Conference Souvenirs

SEFI 2024 will not provide any souvenirs. We have made this decision to express our commitment to strong sustainability principles.

By abstaining from distributing unnecessary items we aim at reducing the amount of waste generated by the event, minimizing our carbon footprint and conserving valuable resources.

We hope to convey the message that the conference's value lies in the knowledge, connections, exchanges and networking that we are privileged to foster, rather than in material possessions.

By prioritizing more meaningful aspects of the event, we hope to create a more impactful and memorable experience for all involved, and set an example for future responsible conferences.

Organizing a conference in harmony with our goals and theme

To create a space for discussions and showcase research and initiatives that foster and strengthens ethics in engineering education, we've taken steps to infuse the event planning with these same values.

From reusable water bottles and recycled lanyards to vegetarian catering and from sponsored scholarships to childcare, our local organizing committee has carefully identified and implemented a number of actions which we hope will serve as a model and will remain as legacy.

Fun Fact

Between February and March 2023, no less than 200 trees of thirty different species, 450 shrubs and 30 fruit trees were planted on campus under the direction of the Outdoor Spaces group of the Sustainability Unit at the Vice Presidency for Responsible Transformation (VPT).

Catering

The choice of a fully vegetarian catering for all lunches at SEFI 24 has been made to reduce the carbon footprint associated with meat production, as well as to support ethical and sustainable food practices.

This decision reflects our commitment to creating an inclusive and environmentally conscious event that aligns with our values of promoting sustainable practices.

The caterer chosen for the SEFI conference is a pioneer in sustainability in Switzerland, namely concerning the offer of menus having larger plant-based options and a reduced carbon footprint.

The ingredients chosen to compose our lunches come from a responsible sourcing circuit with a majority of local, certified or organic products.

Water will be served from glass jugs and we encourage all participants to bring their own reusable water bottle.

Lastly, aiming at reducing waste during the conference, all cutlery is reusable.

Should there be food remaining after all participants have eaten, the excess will be distributed with the help of a students' association.

Gala Dinner

The gala dinner will take place in Aquatis, a center for the protection of ecosystems, particularly of the Léman Lake.

The restaurant offers a fish and meat option in addition to the vegetarian one. The tasteful cuisine will offer fresh and healthy dishes, prepared with local and seasonal products.



More about the
Archimedean
Oath

Archimedean Oath

In the early 1990s, a professional ethics oath for engineers was created at EPFL by a group of graduating physics students.

Thirty-four years later, this document remains a reference text within the institution and has served as a model for other technical universities that have developed their own versions.

Fully in line with efforts to integrate sustainability and ethics into the EPFL curriculum, a working group was formed to work hand in hand with the school's student association to revise and promote this text.

It is an integral part of the conference with an immersive exhibition, a workshop, an interactive poster session, and a round table dedicated to scoping out interest from other institutions and generating an open discussion among participants.

We wanted to ensure that the Oath would be a key element of this conference because it resonates with many questions students are currently asking themselves. We hope that the Oath will remain as a legacy of this conference.

- Valentina Rossi, Teaching Advisor & SEFI 2024 Archimedean Oath working group





It was really important for me not only to put these initiatives in place but to demonstrate that there is indeed a need for these initiatives.

- Joelyn de Lima (right), Pedagogical Advisor & SEFI 2024 DEI Committee



More about our DEI initiatives

DEI actions grounded in evidence

Last December, Joelyn de Lima (Pedagogical Advisor) and Siara Isaac (Scientist), surveyed over 120 researchers from around the world to guide the implementation of initiatives aimed at supporting these values and mitigating systemic barriers that hinder access to this academic conferences for certain groups or individuals.

The SEFI community will be surveyed again during the conference with the aim of adopting an evidence-based approach and ultimately integrate these practices into the conference handbook.

Scholarships for Students and Early Career Researchers

Financial constraints should not be a barrier to accessing new knowledge and networks. Students and early career researchers from low-income and underrepresented countries often face significant obstacles in attending international conferences.

We are committed to fostering diversity and inclusion by offering scholarships (up to CHF 500.00) that reduce registration fees for newer researchers and students.

These scholarships are designed to empower students and early career researchers, enabling them to share their work, learn from others, and build essential networks.

Sponsored Childcare

We recognize that attending a conference while managing caring responsibilities can be a significant hurdle for many participants, especially for parents and guardians of children. This challenge can deter talented individuals from participating and contributing to our event.

To support attendees who are responsible for children, we are thrilled to offer limited sponsored childcare services during the conference.

This initiative aims to provide safe, engaging, and professional childcare solutions, enabling participants to engage with the conference content and networking opportunities.

Inclusivity ribbons

Navigating a conference, especially for the first time or at an unfamiliar location, can be daunting.

Creating visible cues for support and interaction can significantly enhance the conference experience for everyone.

Our inclusivity ribbons are more than just adornments; they are conversation starters

and support signals. With tags like “First time at SEFI”, “SEFI Ally”, and “Ask me about EPFL”, these stickers help attendees identify peers for networking, support, and questions, fostering a welcoming and inclusive atmosphere.

SEFI Ally Training with Breakfast

Inclusivity is not just a policy but a practice. It requires ongoing learning and engagement to create a truly welcoming environment.

For this reason, we’re holding an Inclusivity Ally Training session, accompanied by breakfast, on the first morning of the conference. This session is designed to equip attendees with the knowledge and tools to be more effective allies, promoting a culture of respect, understanding, and support throughout the SEFI 2024 event.

Morning Wellness Activities: Yoga, Tai Chi, Mindfulness, and Running/Walking

Conferences are very busy events that require a lot of social and cognitive engagement – while this can be stimulating, it can also be overwhelming.

The importance of maintaining mental and physical health in such situations cannot be overstated, particularly as these factors are crucial in enhancing overall engagement and productivity.

Emphasising the significance of community and informal networking, we are delighted to offer a variety of morning wellness activities at SEFI 2024.

These sessions provide a dual opportunity: to engage in activities such as yoga, tai chi, mindfulness, or running/walking, and to foster relationships in a relaxed setting.

These activities are specially designed not only to invigorate the body but also to clear the mind, paving the way for increased concentration and a better conference experience.

Program and venue

Sunday 01.09	Monday 02.09	Tuesday 03.09	Wednesday 04.09	Thursday 05.09
07h30		Well-being Activities	Well-being Activities	Well-being Activities
08h00	SEFI Allies Training			
08h45	Keynote 1			
09h00	Doctoral Symposium	Keynote Panel	Keynote 2	Keynote 3
10h30	Coffee	Coffee	Coffee & Poster Session	Coffee
11h00	Parallel Session	Parallel Session		Parallel Session
12h00	Switching Rooms	Switching Rooms	Switching Rooms	Switching Rooms
12h15	Parallel Session	Parallel Session	Parallel Session	Best Paper Award & Closing Ceremony
13h15	Lunch & Newcomers Welcome Event	Lunch	Lunch	
14h15	Parallel Session	Parallel Session	Parallel Session	
15h15	Coffee	Coffee	Coffee	
15h45	SIG Meetings	SEFI General Assembly (SEFI members)	Parallel Session	
16h45	Switching Rooms		Social Program & Scientific Visits for those not attending Gala Dinner	
17h00	SIG Meetings	Social Program & Scientific Visits		
18h00	Fellowships, Book Launch & Welcome Aperitif			
19h00			Gala Dinner	



Conference app
Android



Conference app
Apple



Register for
the well-being
activities



Find your
session's room



Detailed program

From Geneva to EPFL

Departing from Geneva's main train station or from the airport's train station, two options are available :

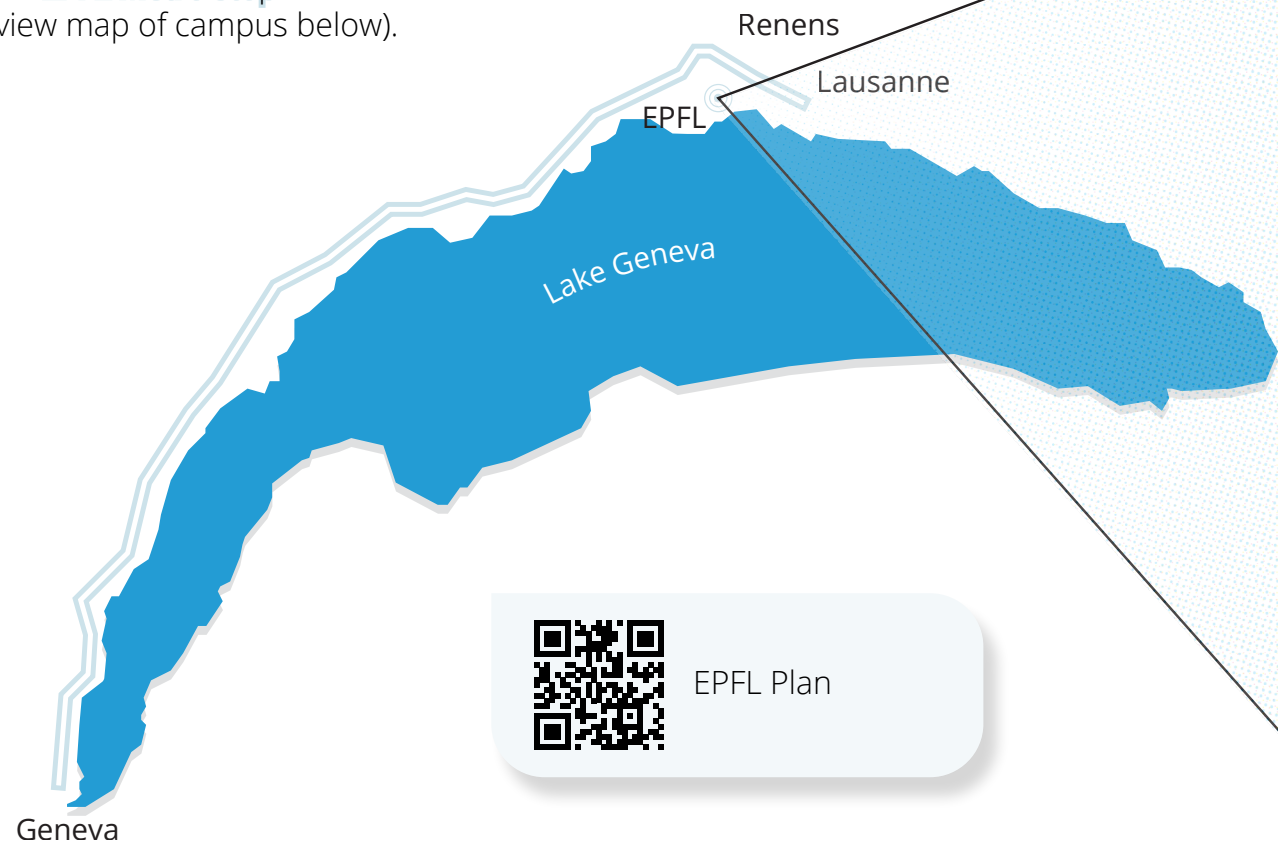
Geneva-Renens: A train ride of approximately fifty minutes will get you to Renens. From there, the m1 Metro (direction Flon) will take you to EPFL ("EPFL" stop) in about ten minutes.

Geneva-Lausanne: A train ride of approximately fifty minutes will get you to Lausanne. From there, take the m1 Metro (direction Renens) and stop at EPFL.

By train

EPFL campus is located approximately 15 minutes away from Lausanne main train station.

We recommend you take the **Metro** (one change m2 > m1) as it might avoid delays due to peak traffic hour, and, even more relevant, the **EPFL Metro stop** is the closest to the venue (view map of campus below).



EPFL Plan



SBB/CFF/FFS
mobile app

By bus

In the EPFL campus there are also multiple bus stops. If you prefer to take the bus, you can insert "EPFL Picard" or "EPFL Colladon" as end destinations in the SBB website.

The buses that serve these stops are B1 and B705.

The Swiss Federal Railway app

The Schweizerische Bundesbahnen (commonly known as SBB, CFF or FFS depending on which linguistic region of the country you're in) provides a free mobile app which allows you to check timetables for any itinerary across the country, including connections with buses and boats, as well as any potential walking distances between them. The same system is also available from your browser.

Travel for free in Lausanne

If you are staying in a hotel, a youth hostel, a bed & breakfast or at a campsite where the tourist tax is applied, you are entitled to the [Lausanne Transport Card](#).

With this card, you can freely use all public transport (bus, train, metro) in Lausanne and its surroundings during your whole stay (maximum 15 days).

Note that your first journey to the accommodation is also free upon presentation of the booking confirmation.

Additional benefits of the Lausanne Transport Card can be browsed [here](#).

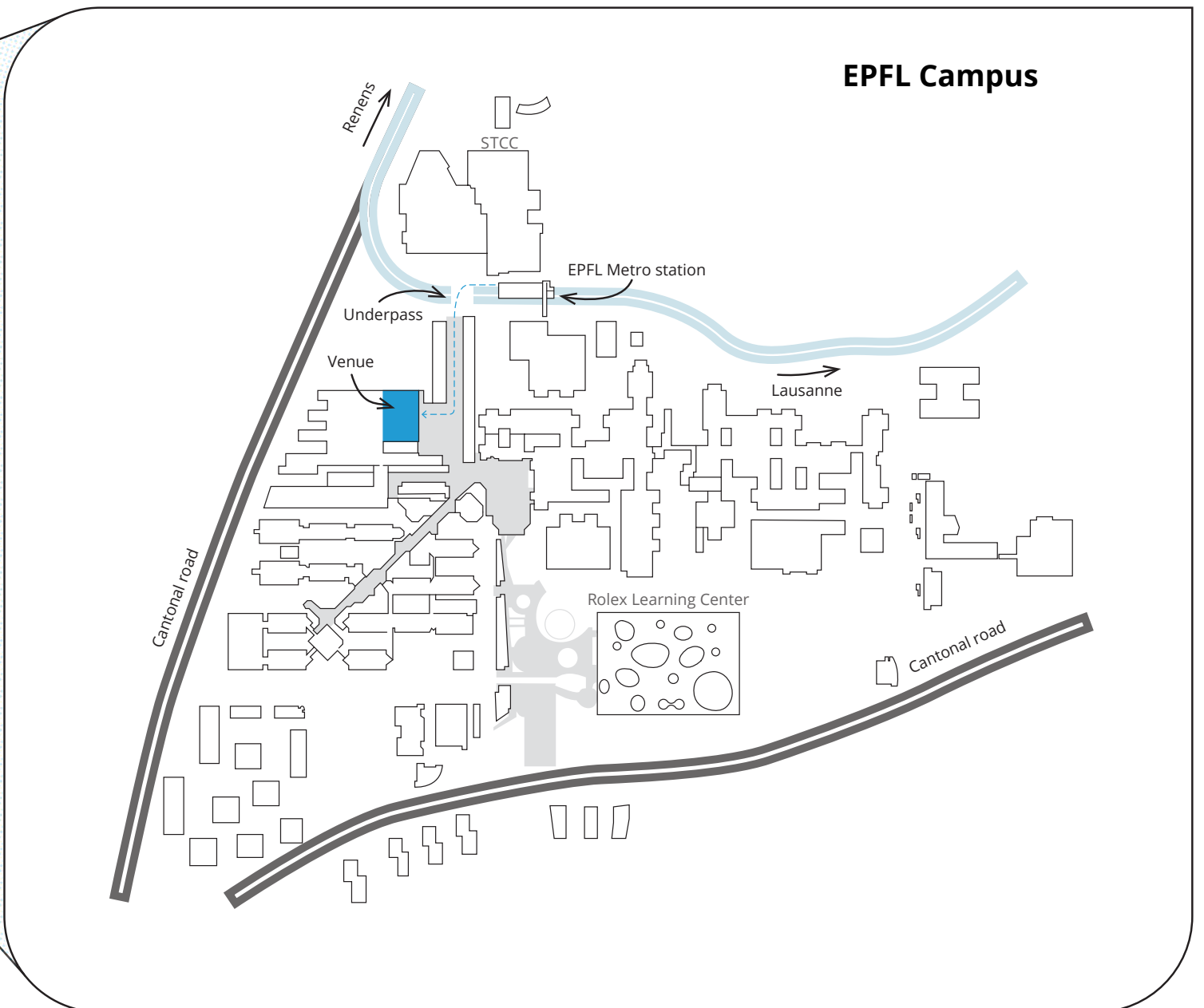
Campus and accessibility

The "EPFL Plan" app is comprehensive and the top left menu lets you filter features according to your needs.

The "Reduced mobility" sub-menu (under "Access and mobility") lists accessible bathrooms, lifts and more.

Info about showers, menstrual products, non-gendered bathrooms are also indicated under the "Equipments" entry.

More options help you locate "publibikes", restaurants and services such as ATMs and grocery/convenience stores.





Discover Lausanne

Both an urban location and a coastal resort, nestled between lake, mountains, vineyards and forests, Lausanne offers all the attractions of a metropolis, yet on a human scale.

Discover unique museums such as Plateforme 10, Lausanne's new Arts District, or the Collection de l'Art Brut (Outsiders' Art Collection), experience anew the values of Olympism by entering the Olympic Museum, a unique place in the world, and enjoy lively nights out in the heart of the city or on the shores of Lake Geneva.

Let yourself be tempted by our innovative gastronomy that reinterprets tradition by showcasing local products and artisan producers.

And ... breathe! Lausanne also has a breathtaking natural setting with Lake Geneva, the Alps and the Jura mountains as a backdrop, and the Lavaux UNESCO terraced vineyards close by.

The Cathedral

At the heart of the old town, the majestic Lausanne Cathedral overlooks the city. Seen as one of the most beautiful gothic art monuments in Europe, it attracts more than 400,000 visitors every year.

The Olympic Museum

The Olympic Capital, Lausanne has been home to the IOC (International Olympic Committee) for 100 years and in 1993, the IOC founded its unique official museum on the banks of Lake Geneva.

Plateforme 10

Just a few short steps from the main train station, PLATEFORME 10 is the new arts district in Lausanne. Unique in Switzerland, this neighborhood has arisen on the site of a former railway locomotive repair shed. The site gathers the Cantonal Museum of Fine Arts (MCBA), the Cantonal Museum of Contemporary Design and Applied Arts

(mudac) and the Cantonal Museum for Photography (Photo Elysée).

Lavaux vineyards

Take a walk through some of the most beautiful scenery in Switzerland: the UNESCO-listed Lavaux vineyard terraces are criss-crossed with marked trails with stunning views over Lake Geneva and the Alps. Little trains on wheels help you up the incline so you can enjoy a walk at your own pace.

AQUATIS Aquarium-Vivarium

AQUATIS opens the doors to Switzerland's largest freshwater aquarium -vivarium. You will travel across five continents while discovering the most fascinating freshwater environments on our planet during a memorable journey. AQUATIS is the place to be for curious visitors, who will be able to observe the most interesting, curious and fascinating species of animals and plants from our world's rivers and lakes.

Collection de l'Art Brut

In the centre of Lausanne, the splendid Château de Beaulieu houses the Collection de l'Art Brut. A one-off in Switzerland, this unusual museum displays the creations of self-taught artists, often the marginalised, detainees or prisoners. Through the permanent and temporary collections, visitors come to reflect on and understand these artists who are not artists.

Panoramic stroll

Set on a hillside facing Lake Geneva and the mountains, Lausanne offers walkers a series of extensive panoramic views. [This downhill stroll](#) allows you to discover the 10 most beautiful viewing points.



Lausanne Tourism
official website



Organizing Committee

This year's SEFI Annual Conference is brought to you by:

The Local Organizing Committee:

- Roland Tormey
- Patrick Jermann
- Jessica Dehler Zufferey
- Roman Brügger
- Klara Ferdova
- Julie Clerget

The International Organizing Committee:

- Roland Tormey (chair), EPFL
- Greet Langie (co-chair), KU Leuven
- Roman Bruegger, Swiss EdTech Collider
- Florence Colomb, EPFL
- Jonathan Da Fonseca, Lausanne Tourism
- Jessica Dehler Zufferey, EPFL
- Klara Ferdova, SEFI
- Hannu-Matti Järvinen, Tampere University
- Patrick Jermann, EPFL
- Klara Kovesi, ENSA, Bretagne

- Euan Lindsay, Aalborg University
- Balázs Nagy, BME, Budapest
- Emanuela Tilley, UCL, London
- Ger Reilly, TU Dublin
- Ramón Vilanova Arbos UAB, Barcelona

The International Scientific Committee:

- Jessica Dehler Zufferey (chair), EPFL
- Greet Langie (co-chair), KU Leuven
- Michael Aklin, EPFL
- Marilynne Andersen, EPFL
- Clément Pit-Claudel, EPFL
- Jerome Baudry, EPFL
- Neil Cooke, University of Birmingham
- Tinne De Laet, KU Leuven
- Hanne Deprez, KU Leuven
- Deolinda Dias Rasteiro, ISEC, Coimbra
- Sonia Gomez Puente, TU Eindhoven
- Aida Guerra, Aalborg University
- Patrick Jermann, EPFL
- Aniko Kalman, BME, Budapest
- Helena Kovacs, EPFL
- Arjan Lock, The Hague University of Applied Sciences
- Veronique Michaud, EPFL

- John Mitchell, UCL, London
- Andreas Osterwalder, EPFL
- Madeline Polmear, Kings College London
- Roland Tormey, EPFL
- Nathalie Wint, UCL, London
- Riikka Kangaslampi, Tampere University

Seven Operational Sub-committees:

In-reach

- Annechien Helsdingen, Yousef Jalali, Joelyn de Lima

Out-reach

- Helena Kovacs, Siara Isaac, Iris Capdevila, Ingrid Le Duc, Cécile Hardebolle, Fabian Mumenthaler

Industry & Sponsorship

- Roman Brügger

Sustainability

- Christian Vonarburg, Valentina Rossi, Olga Kasatkina (liaison with Jacopo Grazioli)

Diversity Equity and Inclusion

- Joelyn de Lima, Siara Isaac

Archimedean Oath

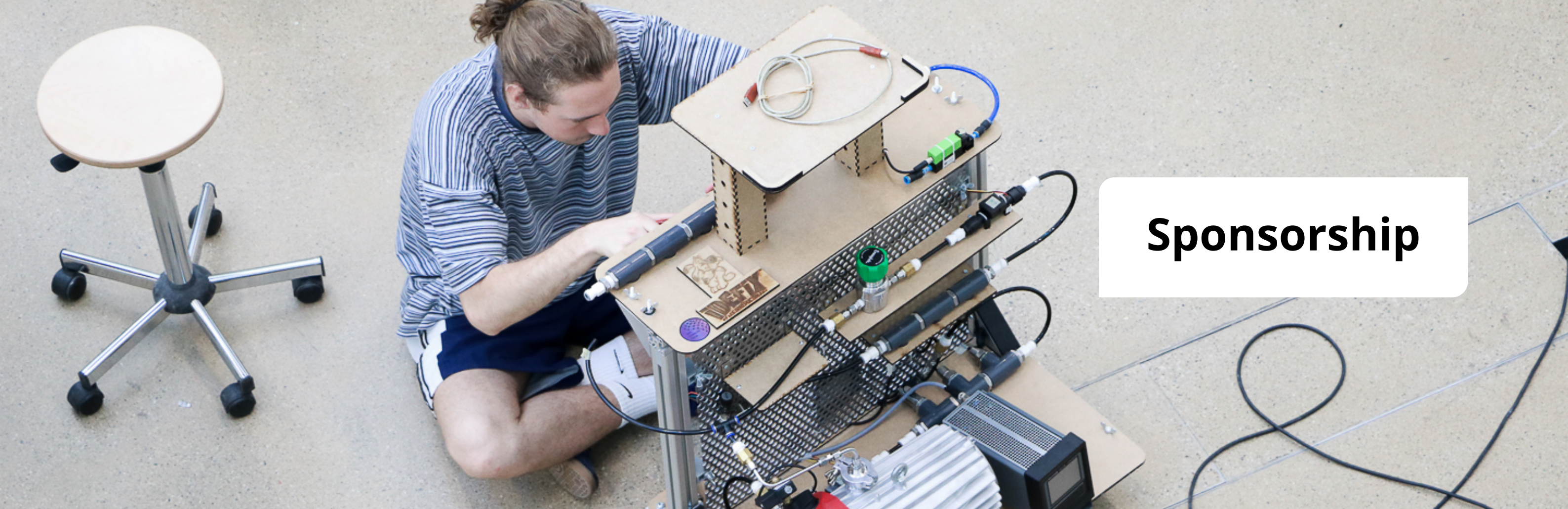
- Valentina Rossi, Ingrid Le Duc

Communications

- Julie Clerget

The European Society for Engineering Education (SEFI):

- Klara Ferdova
- Alexandra Gliga
- Denise Bernardo



Sponsorship

Hosting a conference of such size and scope would not be possible without the generous support of our sponsors.

We are grateful for their genuine interest in advancing engineering education and their dedication towards technical universities, their faculty and most importantly, their students.

We thank:

Our Diamond sponsor:

Dassault Systèmes

Our Platinum sponsor:

Switch

Our Gold sponsors:

MathWorks, Bentley and EPFL's Vice-presidency for Responsible Transformation

Our Silvers sponsors:

Siemens

The 52nd Annual Conference of the European Society for Engineering Education is also proudly supported by 3T PLAY.

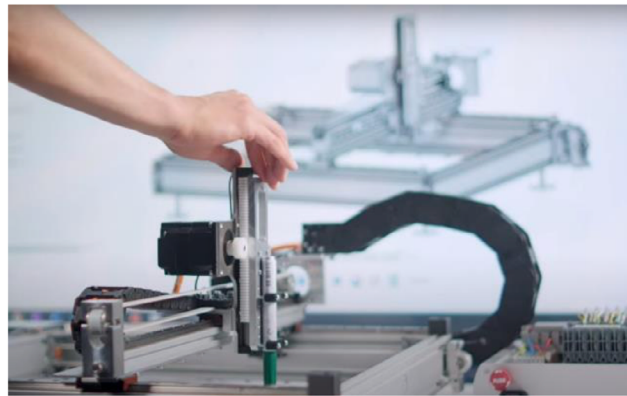


« We need Switzerland »¹ - also in engineering education

Pioneering Virtual Twins at ZHAW

Creating high fidelity digital avatars of technical systems, “Virtual Twins”, before they exist in the real world is what differentiates engineering from tinkering. When physical systems finally exist, they can be connected in real time with their digital replica, by sending sensor data and receiving executable instructions.

A recent study² concluded that virtual twins have the potential to unlock \$1.3 trillion in economic value and 7.5 Gt CO2e emissions reductions till 2030. This is achieved by enabling transformative industry practices such as circular economy.



With Virtual Twins becoming pivotal in engineers’ daily practices, developing related competences in engineering students is a challenge for educators. Where to start?

A SEFI member, the Zurich University of Applied Sciences (ZHAW) has passed the discovery stage of the Virtual Twin by implementing it in an award-

winning application that was recognized in 2024 with the first prize in the “Digital Twin Contest” during the annual conference of the International Federation for Information Processing. Discover in this [video](#) how ZHAW implemented their project by smartly applying systems engineering with Dassault Systemes’ 3DEXPERIENCE platform.



ZHAW is a 3DEXPERIENCE EDU Center of Excellence. Discover more about this global program [here](#).

Deploy your learning activities with the 3DEXPERIENCE platform and empower tomorrow's talents to rewrite the future of industry and society: [Here](#) you can discover myriads of tools, information, certification, inspiration and contacts that help educators to combine the performance of virtual twins and the mindset of sustainable engineering.



¹ “We need Switzerland ” is the motto of an ongoing campaign of Switzerland Tourism.

² “Virtual twins and sustainability” – Accenture research Report – March 2021



More about Dassault Systemes

« We need Switzerland »³ - also in engineering education

Experiencing sustainability at EPFL Racing

Sustainable engineering requires science, knowledge and practices combined with context sensitiveness and ethics: a [mindset](#).

What better than experiential learning to develop it in engineering students?

The Formula Students racing competition is such a great opportunity.

The EPFL Racing team of students is a pioneer in combining technical performance with the mindset of sustainability. The team is the first Formula Student organization with its own sustainability department.

The team uses Dassault Systemes’ 3DEXPERIENCE platform and its Lifecycle Assessment (LCA) solution to assess the environmental impact of its electric Formula Racing car. LCA capabilities accurately measure the end-to-end environmental impact of a product. The solution brings together data points from thousands of sources to measure broad sets of impact indicators, from pollution and freshwater ecotoxicity and acidification to energy consumption in manufacturing processes or the use phase of the car and the impacts of human activities, including travel between racing events.

Interestingly, Dassault Systemes’ partner providing, maintaining and expanding the ocean of relevant impact data is the ecoinvent association, the world leader in the provision of environmental data, founded by EPFL and other Swiss institutions



Through the team’s partnership with Dassault Systemes, EPFL students could use the LCA solution even before it became available to all universities in Europe. They are now proficient with the 3DEXPERIENCE for managing all design, engineering, simulation and project management processes in an authentic sustainable engineering mindset. Learn more about their learning adventure [here](#).

Deploy your learning activities with the 3DEXPERIENCE platform and empower tomorrow's talents to rewrite the future of industry and society: [Here](#) you can discover myriads of tools, information, certification, inspiration and contacts that help educators to combine the performance of virtual twins and the mindset of sustainable engineering.



³ « We need Switzerland » is the motto of an ongoing campaign of Switzerland Tourism.

3T PLAY



Access the 3T PLAY resources via the Zenodo platform (open-access)

3T PLAY framework and activity guides provide an open-access, evidence-informed approach to teaching transversal skills for engineering students

As the SEFI community knows well, transversal skills are essential for engineering students to fully leverage their technical skills and to constructively contribute to complex, dynamic global challenges. While improving how transversal skills are taught in higher education involves initiatives at many levels, the 3T PLAY project from the Swiss Federal Institute of Technology in Lausanne (EPFL) focuses on how individual instructors can structure their lessons to target the development of students' skills.

While differences in terminology exist between institutions, researchers, and accreditation bodies, we define transversal skills as non-technical or disciplinary skills that are relevant across many contexts. For instance, negotiation, conflict resolution, intra- and interpersonal communication skills, inclusion,

and ethical reasoning. While there is strong, multilateral agreement on the importance of these skills for engineers, concern about the development opportunities provided by current engineering programs has been expressed by students, alumni, educators, institutions, accreditation bodies and employers.

Activities that employ a micro-experiential learning approach

The 3T PLAY team has worked with instructors in diverse educational settings to create, iterate, and evaluate its trident framework for teaching transversal skills through micro-experiential learning opportunities focused on transversal skills. The activities implement evidence-informed approaches including low-stakes experimentation, short feedback loops, iteration, desirable difficulty, and opportunity for reflection. Each activity used tangibles to create experiential learning opportunities. While tangibles are widely used to teach technical skills in engineering, we have found little prior evidence of their application for transversal skills development.



As illustrated by the 3T PLAY framework below, interventions targeting the development of transversal skills should involve 3 types of pedagogical activities - **Knowing** (what is the skill, why it is important, and what strategies can be employed), **Experiencing** (engaging activities that intentionally leverage the skill), and **Learning from Experience** (explicit reflection prompts to help students transfer what they learned to their next project).



Meet the 3T PLAY team at SEFI 2024 in Lausanne

- Book launch: Discover the 3T PLAY resources on Monday Sept 2nd, 18h.
- Hands-on workshops and presentations: check out the conference platform for multiple contributions from the 3T PLAY team (search de Lima, Isaac, Jalali or Rossi).
- Exposition table: discover the materials and get your hands on some tangibles.
- Resources to support implementation: Let's speak about how we can support you to adapt 3T PLAY materials for your own context.

3T PLAY is a joint initiative of the Center for Learning Sciences (LEARN), the College of Management, the Teaching Support Center (CAPE) and the Discovery Learning Program Makerspace at the Swiss Federal Institute of Technology (EPFL). The project is kindly supported by the LEGO Foundation, in the context of exploring transversal skills through new, playful and creative learning approaches.

Switch

Who is Switch?

In the 1980s, the Swiss government recognized the need for a national university and research network. In 1987, they co-founded the Switch Foundation with the eight cantons that housed universities at the time. Originally tasked with building and operating a national computer network, Switch soon took on responsibility for managing the .ch domain and allocating .ch domain names—a milestone in Swiss internet history.

What does Switch do?

Switch has developed significant expertise in areas such as cyber security, digital identity, cloud services, legal and procurement, research networks, and domain registries. However, the challenges of digitalization require the foundation to evolve beyond these technological domains. Switch aims to become a driving force for digital transformation in Switzerland's education and research system, acting in the interest of both the federal government and society.

Many digitalization issues cannot be tackled by the government and education policy alone. They demand technological understanding and interdisciplinary solutions. This is where Switch's original role comes into play: not only providing technological solutions but also identifying fundamental questions that need solving.

Despite rapid technological advancements, the education system lacks agility and speed in adapting. In this context of varying development speeds, Switch serves as a bridge builder. Even in Europe, where digitalization is more advanced than here and our political standing is not as strong, Switch plays a crucial role in areas like cyber security and digital identity.

How does Switch do this?

As an integral part of Swiss universities, Switch goes beyond merely providing technological solutions. As a non-profit foundation, it operates independently of commercial interests, prioritizing the needs of the university

community. Switch acts as a bridge builder, emphasizing solidarity and collective benefit. Unlike purely commercial entities, Switch takes a broader approach, considering solidarity. For instance, larger universities contribute more than smaller ones. Switch's significance lies not only in efficient service provision but also in its unique position, placing principles of solidarity and collective benefit at the forefront. In this regard, Switch plays an essential role, offering a path aligned with the entire community's interests.

The Switch Video Services

Another important service at switch is video.

At Switch, we understand the crucial role that video content plays in modern curricula. Our innovative solutions, Switch Tube and Switch Cast, are tailored to enhance your teaching and learning experiences.

Switch Tube is our comprehensive video management platform, offering robust features for organizing, sharing, and accessing educational videos seamlessly. Whether you are curating content or providing students with on-demand resources, Switch Tube simplifies the process, ensuring a smooth and user-friendly experience.

Switch Cast, on the other hand, is our powerful lecture capture and live streaming solution. It enables educators to record lectures in high quality, stream them live, and make them available for later viewing. With Switch Cast, you can reach a wider audience and provide flexible learning opportunities for your students.

Since before the pandemic, lecturers from all Swiss universities need their lectures to be available as livestream or as recording to allow knowledge exchange. They need to create interactive learning materials that motivate students of all backgrounds. Not only do these videos need to show multiple images (lecturer, presentation, subtitles, etc.), but they must be supported by quality imaging, good audio and be made available on platforms nowadays standard in all educational organisations. A trusted ad-free system should offer video lessons, a virtual classroom, webinars and

other educational events in a reliable full-access video library.

Lecturers need to:

- Easily combine videos from multiple cameras, presentations, screens and existing data.
- Share content securely so that only authorised persons can access it.
- Find any video or scene with a quick search in the video library.
- Connect with viewers over live and on-demand videos.
- Monitor audience behaviour and measure audience participation
- Have their content transcribed so it will be searchable and translated to other languages.

For more information, please visit our booth in the main area.



More about Switch



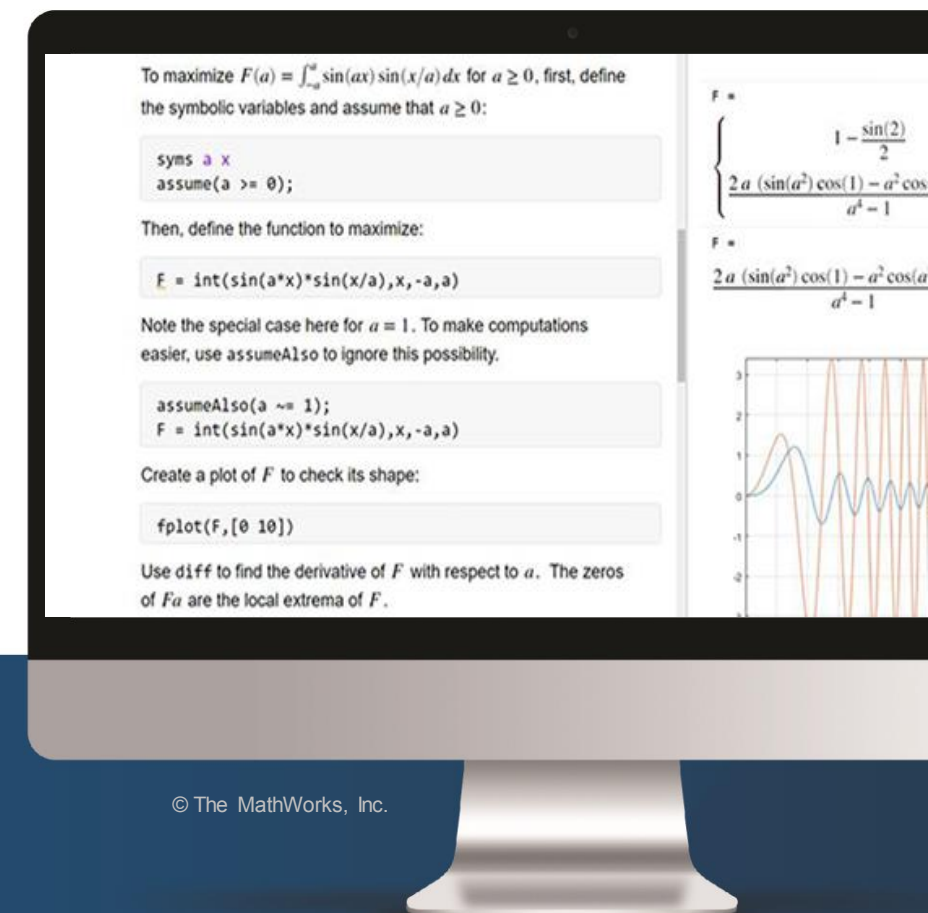
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Advancing Infrastructure

Sustainability at Bentley Systems

At Bentley, our vision is influenced by the unprecedented transformation that will need to happen in the upcoming years to achieve sustainable development goals and future-proof the world's infrastructure. Infrastructure digital twin solutions will be an essential enabler and accelerator in this journey. Infrastructure digital twin solutions and sustainable development go hand in hand.

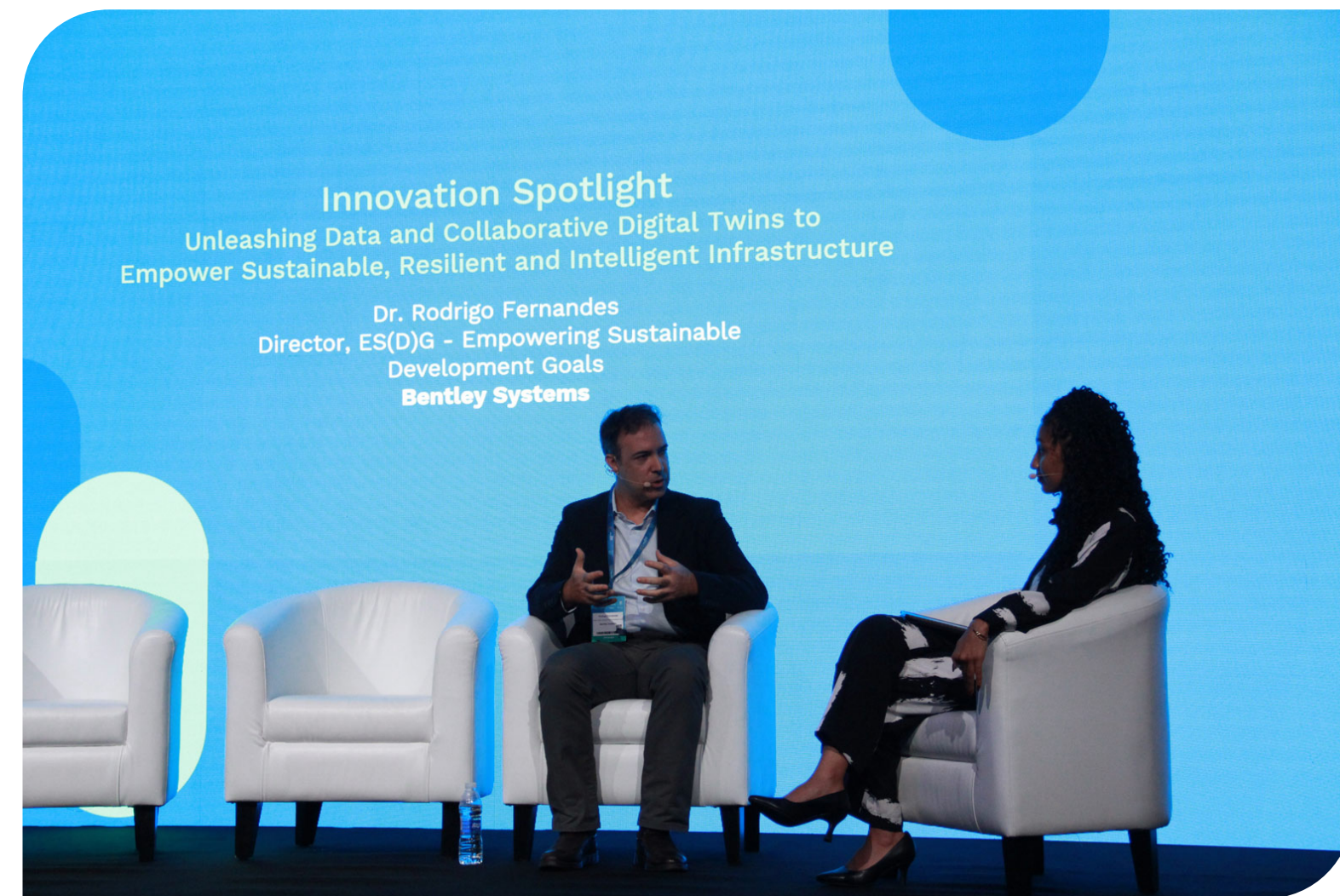
Infrastructure professionals are leading the effort to decarbonize and climate-proof our infrastructure on a scale and pace never seen before. Yet they face multiple obstacles, from engineering resource capacity shortfalls to challenges in aligning the information and teams necessary for success.

It's time to reimagine what's possible by leveraging data for better and more resilient infrastructure. Through innovations like AI-powered infrastructure digital twins, we can accelerate the digital and sustainable transitions necessary for climate action. Since no one company or organization can

address these challenges alone, Bentley is collaborating with multiple users and partners empowering sustainable development goals and addressing key issues such as:

Decarbonizing Infrastructure. Built infrastructure is responsible for more than 75% of global greenhouse gas emissions, and 75% of the infrastructure required by 2050 still needs to be built. Existing and new infrastructure must be designed, built, and operated with sustainability and resilience in mind.

Powering the Energy Transition. The energy industry is undergoing one of the largest industrial transitions in modern history. Understanding the earth and its subsurface are indispensable for making clear, confident decisions to accelerate clean energy production, transmission, and distribution and aid the shift to net zero.



Climate-Proofing Cities. The global population is expected to increase by 2 billion over the next 30 years. Digitization is essential to effectively plan and deliver the sustainable infrastructure and services necessary to ensure urban resilience, climate adaptation, inclusive cities, and residents' well-being.

Overcoming Water Challenges. In many ways, climate change is water change, as it affects water quantity, quality, and availability. Integrated urban water management and water system modernization can help communities improve access to clean water and sanitation and minimize climate change effects such as water scarcity and floods.



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