
Doctoral Position within the field of Construction and Technology at the Academy of Architecture of the Università della Svizzera italiana (USI)

Università della Svizzera italiana (USI) is a young and lively university, a hub of opportunity that is open to the world, where students are offered a quality interdisciplinary education in which they can be fully engaged, and where our researchers can count on having the space to freely pursue their initiatives. Established in 1996, USI is in constant evolution, always taking on new challenges while remaining true to its three guiding principles: quality, openness and responsibility.

At the Academy of Architecture in Mendrisio, a faculty of the Università della Svizzera italiana (ARC-USI), Prof. Dr Ena Lloret-Fritschi's new group aims to develop sustainable design methods for architecture fabricated with cutting-edge technology using concrete and earth-based materials.

Prof. Dr. Lloret-Fritschi is a pioneer in the field of digital concrete, with the project Smart Dynamic Casting – which has led to a family of concrete processing technologies known as Digital Casting Systems (DSC). DSC controls the hardening of concrete on the fly of production. Doing so enables, e.g. concrete construction using minimal formworks, thereby reducing the materials used. The DSC processes were developed in an interdisciplinary context at the ETH in Zürich - with a significant focus on technology development. Now in the new group, it is time to understand how these technological advances inscribe into architectural design and construction. To achieve that, the group seeks to establish an iterative information flow between design, structure, material, and fabrication, thus establishing a process which is efficient in terms of material, time and cost and which can be transferred to a range of building materials, with a particular focus on concrete. The aim is to develop a material and fabrication agnostic design architecture to design buildings with less material.

Within this context **we are looking for a talented candidate holding a MSc in a construction related field, with a solid conceptual approach to structural engineering and good skills for interdisciplinary work.**

Experience or interest in developing structural systems and reinforcement strategies leveraging cutting-edge technology in digital fabrication (beyond 3D Printing) is required. The research objective will be to develop structural systems that (i) can be designed with general mechanical principles and (ii) enable us to reduce up to 50% of the use of materials with respect to standard concrete structures.

The doctoral thesis will be pursued in an interdisciplinary context within the NCCR Digital Fabrication and co-supervised by the Group of Prof. Kaufmann at ETH Zurich, which has a comprehensive experience in digitally fabricated concrete structures. Due to the interdisciplinary setting, we expect an excellent candidate that enjoys working independently and in a team. The development of material-optimised structures might require implementing design to production computational workflows, this is why we seek for a candidate able to learn multiple programming languages and structural analysis tools while keeping a link to conceptual hand calculations.

General terms:

- 3-year contract (after trial period).
- Start date: upon agreement
- Workplace: Academy of Architecture located in Mendrisio, Switzerland.
- Availability to travel to other parts of Switzerland and abroad (for purposes of collaboration and research) is required.

All applications must include:

- Motivation for submitting the application
- Max two-page research statement outlining areas of research the candidate would be interested in developing (in English)
- CV
 - o Information about qualifications obtained
 - o Professional experience
 - Links to (English); examples of papers or texts that have been prepared for previous symposiums or conferences.
 - Portfolio of work in academia and/or practice
 - Educational and work certificates (last qualification obtained).
- At least two academic references

As an institution that values diversity, USI particularly encourages applications from women and from all individuals from underrepresented groups.

Applications must be compiled into one single pdf and sent to: ena.lloret.fritschi@usi.ch.
NOTE application received in any other form will not be considered.

Applications received before 1.3. 2023, 23:59 CET will be given priority.

A process of assessment will be followed by an invitation to interview.