

HABITAT RESEARCH CENTER - EPFL - ENAC

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HABITAT Research Center
Grant 2018 – Call for Projects: “Time machine prototype”

Introduction and Background

HABITAT Research Center is an inter-pluri-transdisciplinary research platform. Its aim is to explore the urban phenomena and to produce visions, strategies and projects on this primary and crucial topic. Cities are at the same time complex societies, material sedimentations, technical systems and ecological organizations. These four indivisible aspects lie at the foundation of the research center.

HABITAT seeks to enable and encourage a profound interdisciplinary collaboration among EPFL and ENAC laboratories that share a common urgency: the need to explore the interactions between spatial, social and environmental processes through the dimension of time. Nowadays cities and territories have to face processes (i.e. economic, environmental and social crises) where multiple and complex dynamics are replacing static and immanent ones. Through a 4D data-modelling, HABITAT aims to explore the potentialities of an interdisciplinary *time machine*, to look at the multiple scales of both space and time and to reinforce the existing synergies among artificial, natural and social environments while unfolding new ones to be explored.

Objectives

This call aims at building “time machine prototype(s)” experimenting a new approach (4D data modelling) for integrating multi-scalar spatiotemporal phenomena. Such a prototype serves to build multidisciplinary images (and questions) exploring the multiple dimension of time: the historical (the extensive time, the palimpsest); the present (contemporary dynamics and flows) and the future (both short and long term scenarios). Within this framework this call aims at building spatial prototypes of chronological interconnections between: the history of the territory, construction, materials, processes, practices; the cultural heritage (both built and unbuilt); the dynamics of mobility, energy, air, hydrology; evolution of landuse (soil and subsoil); territorial infrastructures (visible and invisible) ...

The goal is to test the time machine prototype applied to spatial and natural sciences, demonstrating how there can be an excellence of individual research that, if linked to others and placed in time and space, can produce additional knowledge while revealing new research questions.

4d modelling

For building such a platform, a large-scale knowledge graph needs to be constructed in space and time. This requires both an unambiguous way of indexing spatiotemporal entities as 4 dimensional volumes and a multi-scale hierarchical system capable of offering a standard way to express 4D intervals.

Only a multiscale system can allow the merging of this different information into a unified indexing system. This 4D index could be the pivotal reference system for both the information content of the knowledge graph and the 3D reconstructions resulting from the scanning campaigns.

Partners and project background

This call benefits from the collaboration between HABITAT and EPFL's Digital Humanities Laboratory (DHLAB). More precisely, the Time Machine FET Flagship project <http://timemachine.eu> is a European-scale project involving more than one hundred institutions, 20 of which have decided to directly fund the application of a project that will be part of the *ICT for Connecting Society (Information-Communication Technologies)* cluster. Within this context HABITAT and DHLAB have decided to collaborate to explore how new Information Technologies can be combined with data from research produced by the various domains related to complex societies, material sedimentations, technical systems and ecological organizations.

The FET Flagship Project already benefits from the cooperation of major European geographic agencies that are ready and able to provide cartographic datasets and the main sources for urban and territorial analysis. The project also involves the collaboration of important European 3D modeling centers, GIS systems, digital architecture and historical databanks. HABITAT also offers an important opportunity to benefit from partnerships with the FET Flagship Project to create a Center of excellence for 4D Research.

Eligibility

Any EPFL Lab or cluster of labs can apply to this call as long as at least one lab in the cluster is part of the ENAC School. Projects must propose a relevant case study (with a related database) to investigate a spatio-temporal research question. Case studies within Switzerland (in particular the Lemman region) are welcome, but all geographical areas will be equally considered. Proposals upon on-going research case studies are strongly encouraged: the call aims at building a research connectors between and reaching out from ENAC research projects.

Data

Different kinds of data may be localized in space and time, aligned and integrated in a standardized manner. The call proposes that all datasets are to be processed through the DHLAB Information Technologies and the 4D Server Platform. Models as different as LIDAR 3D scanning, 3D and BIM models, photogrammetric models based on aerial or ground imaging, raster-, GIS dataset- and statistics models, or simply collections, catalogues or list of information associated with space and time can form a time machine prototype. Some datasets might need specific elaboration to be integrated into the 4D platform. HABITAT will also grant projects aiming at building new datasets if the proposal is deemed valid.

Funding and budgeting

This call will grant up to 30.000 CHF for each multi-lab project (proposed by two labs or more, one of which within ENAC), and up to 10.000 CHF for single-lab projects (proposed by one ENAC laboratory). This funding may be used to cover data acquisition and raw data processing, field visits, travel expenses, equipment, salary costs for EPFL staff. A detailed budget must be provided.

Submission of applications

Applications must be sent via the electronic format application form to Habitat Research Center at: habitat@epfl.ch

Each application will have to include:

- project title
- ENAC laboratory (EPFL laboratories) involved
- name of project leader
- project description (1.500 words maximum, indicating research questions, case study(ies) and expected results)
- detailed description of the datasets it proposes to use
- detailed budget allocation

Completed applications must be submitted no later than **15 March 2018**.

Late or incomplete applications will not be considered.

Evaluation and selection

An evaluation committee will select the successful proposals on the basis of the following criteria:

- relation with the spatial-temporal dimension
- interdisciplinarity
- coherence and quality of data proposed

The committee will be composed by the director of Habitat Center (Paola Viganò), the director of Digital Humanities Laboratory (Frédéric Kaplan) and by at least one component for each ENAC institute (Architecture IA; Civil Engineering IIC; Environmental Engineering IIE).

Timeline

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| 5 February | 2018 | Launch of the Call for 1 year projects |
| 15 March | 2018 | Deadline for submission |
| 1 April | 2018 | Acceptance Notification |
| June | 2018 | First Workshop – methodology and synergies |
| October | 2018 | Second -Workshop – intermediary results |
| January | 2018 | Third Workshop – finalisation of the results |
| March | 2019 | End of the project |
| Spring | 2019 | Presentation of the project at the ENAC Research Day |

Contacts

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