Job description

Position : Junior Professor Chair

Occupation or Job Type * : Lecturer-researcher in higher education
*** REME, REFERENS, BIBLIOFIL**

Job Description Form

Position Category : A

Status (Permanent, Non-permanent, Open) : Non-permanent

Contract term: 4 years and after assessment of scientific merit and professional aptitude by a tenure committee, the candidate will be eligible for a permanent position.

Body in which the person concerned is to be granted permanent status: University Professor

Speciality: Surveying

Corresponding CNU section: 60

Title of contract and post concerned: Digital Twins for Cultural Heritage - Twin4CH

Research budget available over 4 years:

ANR Package	200 000€
Co-financing (Heritage recording projects)	35 000€

Quota: full time position

Affectation

Administrative : INSA Strasbourg
Department or platform: Civil Engineering and Surveying Department
Location : INSA Strasbourg / 24 boulevard de la Victoire / 67084 Strasbourg Cedex

INSA Strasbourg

The National Institute of Applied Sciences (INSA) of Strasbourg is a public institution with a scientific, cultural, and professional character. It hosts 2,000 engineering and architecture students on its campus located at Esplanade, near the city centre. It employs 270 permanent and non-permanent staff members.

Its missions include:

- Initial training of engineers and architects, scientific and technological research, lifelong training for engineers and technicians, dissemination and promotion of scientific and technical culture

INSA Strasbourg offers:

- 7 engineering specialisations: civil engineering, topography, electrical engineering, mechanical engineering, plastics engineering, mechatronics, climate and energy engineering
- 6 apprenticeship programs (FIP, FISA)
- 1 architecture program

INSA Strasbourg gained extended responsibilities and competences on January 1st, 2013.
INSA has implemented measures to address psychosocial risks (RPS) by focusing on prevention, detection, and intervention.
Additionally, INSA Strasbourg has established mechanisms to address sexist, sexual, homophobic, or transphobic violence for both staff and students.
Moreover, INSA Strasbourg has implemented a gender equality plan, demonstrating its commitment to advancing real equality between women and men.
INSA is certified HRS4R (Human Resources Strategy for Researchers) since March 15, 2022.
The school provides access to the University of Strasbourg's collective catering and sports facilities, as well as university libraries.

As part of its sustainable development policy, INSA contributes to funding soft mobility for its staff (reimbursement of 50% of public transportation costs and sustainable mobility package for bicycles, carpooling, shared mobility services, etc.).
Finally, eligible staff members have access to telecommuting according to the rules set by the school's governing bodies.

R & D Platform of the Surveying engineering Specialty – ICube-TRIO Research Group

INSA Strasbourg's research aims to develop excellence in applied research in the disciplines of engineering and architecture. The recording of built heritage and BIM modelling is a research area that has been developed at INSA Strasbourg for more than 20 years (within the multi-site UMR MAP Laboratory from 2002 to 2010, then within the UMR ICube Laboratory, in the TRIO team since 2010). TRIO researchers are attached to the Civil Engineering and Topography Department and have a strong regional, national, and international scientific outreach (host of the CIPA Symposium at INSA Strasbourg in 2013, LowCost 3D Workshop in 2019, several Chair responsibilities in the ISPRS Congress in Nice in 2020, 2021 and 2022, members of scientific committees of international congresses, co-editors of international journals, etc.). The Twin4CH (digital twins for Cultural Heritage) project will strengthen INSA Strasbourg's position as a key player in regional research and contribute to its international visibility. The Chair is thus in line with two of the societal challenges of the INSA Group's scientific strategy and with one of the challenges of the Grand-Est Region.

INSA Strasbourg offers several engineering degrees (Master level). The Junior Professor Chair "Twin for Cultural Heritage" will be attached to the Civil Engineering and Surveying Department (the majority of lecturers and researchers are attached to the CNU 60).

Missions

Main Mission:

Twin4CH is part of the ICube laboratory's strategy through the activities of the TRIO team, in particular topic 3: "Recording of Heritage and BIM" within the IRTS department of the ICUBE Laboratory UMR 7357. Researchers in this area are developing tools for measuring, understanding, representing, and managing urban and architectural heritage using geomatics techniques (photogrammetry, laserscanning, remote sensing and geographic information systems). This topic brings together activities involving the 3D acquisition of georeferenced spatial data at the scale of the urban environment or at the scale of a historic site. Applications include the recording of cultural heritage, interior and exterior modelling of buildings (mainly historic) and modelling of the urban environment at different scales, in support of the development of simulation tools for urban climatology. The team has been a partner in several projects funded by the National Research Agency ANR (URBANIA, COOLTREES, BIOM), and is currently the project leader of the ANR TIR4sTREEt (ANR-21 CE220021) and a partner in the INTERREG VI project "Châteaux Rhénans / Burgen am Oberrhein (2023-2025): digital twins of castles and 4D reconstructions of historical periods". Twin4CH meets the objectives of CIPA, the International Committee for Cultural Heritage Documentation (https://www.cipaheritagedocumentation.org/), an organization in which the INSA/ICube TRIO team is well identified through its research works, 3D recording activities and active participation in international events.

Main activities :

Research:

The 3D surveying, documentation, and management of built cultural heritage is a crucial aspect of historic preservation. The Twin4CH project is part of an interdisciplinary research project focusing on the operability of 3D recording methods (photogrammetry and laserscanning), given the methodological challenges identified in the various communities (researchers, architects, engineers, archaeologists, geographers, geologists, historians and heritage managers). It is based on three pillars:

- acquisition of spatial data and definition of imaging methods at the scale of the urban environment (e.g. buildings and trees) or a historic site;
- segmentation and modelling of topographical and architectural objects: automation of the generation process, quality study of 3D models, automatic data segmentation (machine learning and artificial intelligence), texturing of 3D digital models;

- Spatial data management: publication of 3D data, multi-scale heritage BIM, representation and visualisation (virtual, augmented and mixed reality).
Twin4CH offers solutions for producing robust digital robust models designed to facilitate the preservation, research and public dissemination of built heritage.
Key words: topography, photogrammetry, computer vision, laserscanning, imaging, geomatics, artificial intelligence, BIM, 3D modelling, virtual reality, heritage, digital twin.

Lecturing:
Lecturing responsibilities (64h eq. TD) will involve students in the Surveying and Civil Engineering specialties, as well as students in the combined Architecture and Engineering cycle. Involvement in the IRIV Master's programme (TOPO course) is also required. The teaching service will be built around three themes:
- 3D data acquisition (conventional topography, GNSS, photogrammetry, laserscanning, drones)
- 3D data processing (segmentation, modelling, 4D BIM, GIS, AI)
- new applications arising from the visualization of 3D data (virtual, augmented and mixed reality, game engines) and the exploitation of 3D geospatial data platforms.
Equipment from the TRIO team's research platform at INSA Strasbourg and the topography platform will be made available for projects and teaching.
Active participation in proposing and following up projects (technological survey, master thesis), in the choice of equipment and software (technology survey), and in the promotion of the specialty (Open Day at INSA, Topography Day, Science Day, Heritage Day, etc.) will also be expected.
Key words: topography, photogrammetry, computer vision, laserscanning, imaging, geomatics, artificial intelligence, BIM, 3D modelling, virtual reality, heritage, digital twin.

Special Conditions of Employment:

Supervision: Yes

Project Management: Yes

Travel: Yes

Gross Salary : €3 443,50

Skills

Knowledge:
- Research policy and innovation
- Subject area: surveying and geomatics
- Practical knowledge in the disciplines lectured
- Legal and ethical framework
- Research investigation methods
- Organization of the higher education system

Expertise:
- Apply scientific methods and documentation techniques
- Design educational tools
- Speaking in public (In French and in English)
- Work as part of a team
- Use software specific to the activity
- Initiate and lead partnerships

Soft skills:
- Autonomy, self-control and self-confidence
- Organizational skills and ability to manage stress
- Creativity and innovation
- Thoroughness and reliability
- Critical thinking
- Capacity for conceptualization and intellectual curiosity
- interpersonal skills

INSA INSTITUT NATIONAL DES SCIENCES APPLIQUÉES STRASBOURG

HR EXCELLENCE IN RESEARCH

Application profile
Level of studies (with possible specification of the Speciality): Hold a PhD, hold university diplomas, qualifications and degrees that are equivalent to a doctorate, awarded by the Scientific Advisory Board meeting in restricted formation.
Level of experience: It is recommended to have completed at least 3 years of scientific activity after the thesis and, for PhD holders in France, to have significant experience of mobility abroad (at least two years) and experience in creating partnerships.
Language (and level required): must be able to teach in English and in French.

Follow-up and application procedures
Vacancy date: September 1, 2024
Publication date: 16 avril 2024
Elements of the application: • Copy of identity document, diplomas and qualifications, • Curriculum vitae giving a presentation of the applicant's work • Letter of motivation • any other relevant documents
Role-playing exercise: X Yes ☐ NO "The audition may include [...] one or more on-site or remote work placements, in particular in the form of one or more lessons on a free or compulsory theme, a seminar to present research work or a meeting with students or teachers-researchers, researchers or similar staff in the research or teaching unit in which the post is open. This practical experience may be public under the conditions laid down in the recruitment notice. During these simulations, the selection committee acts as an observer and intervenes only to ensure that the simulation runs smoothly", article 10 of Decree no. 2021-1710 of 17 December 2021. If Yes : **X public** ☐ non-public In form: ☐ of lesson(s) **X** of **research presentation seminar** ☐ meetings (with students or lecturers, researchers or similar staff in the research or teaching unit research or teaching unit in which the post is open).
Application Address: Applications must be submitted via Galaxie (FIDIS module). Only those applicants whose applications have been shortlisted by the selection committee will be invited to the audition. The application is open to candidates from 15 April 2024 at 10am to 31 May 2024 at 4pm.
Contact person for position information : pierre.grussenmeyer@insa-strasbourg.fr