Offer #2025-08834

Post-Doctoral Research Visit F/M [DRI Campaign] Postdoctoral Position: Adaptive Input for Digital Fabrication and Design

Contract type : Fixed-term contract

Level of qualifications required : PhD or equivalent

Fonction : Post-Doctoral Research Visit

About the research centre or Inria department

Created in 2008, the Inria center at the University of Lille employs 360 people, including 305 scientists in 15 research teams. Recognized for its strong involvement in the socio-economic development of the Hauts-De-France region, the Inria center at the University of Lille maintains a close relationship with large companies and SMEs. By fostering synergies between researchers and industry, Inria contributes to the transfer of skills and expertise in the field of digital technologies, and provides access to the best of European and international research for the benefit of innovation and businesses, particularly in the region.

For over 10 years, the Inria center at the University of Lille has been at the heart of Lille's university and scientific ecosystem, as well as at the heart of Frenchtech, with a technology showroom based on avenue de Bretagne in Lille, on the EuraTechnologies site of economic excellence dedicated to information and communication technologies (ICT).

Context

This position is part of the **INPUT Associate Team**, a collaborative research effort between Inria Lille's LOKI team and the University of Waterloo's HCI group, focused on rethinking how interactive systems handle user input: from sensing and filtering to processing and transforming in real time.

This postdoc will focus on applying these design objectives to **digital fabrication and design tools**, such as **interactive fabrication systems**, **CAD environments**, and **AI-assisted modeling workflows**. The position aligns with LOKI's broader research on interaction dynamics and human-centered design technologies, with an emphasis on precision, adaptivity, and real-time control.

The successful candidate will work on core challenges of **manual input pipelines**, **digital tool controls**, and **context-aware intent prediction**, contributing to new systems that support expert and novice users in **designing, prototyping, and fabricating artifacts** through digital or hybrid digital-physical processes.

Research will take place at Inria Lille with potential research stays at the University of Waterloo, supported through the Associate Team.

Assignment

We seek a postdoctoral researcher interested in exploring **adaptive input pipelines** for software and systems used in digital fabrication. This includes real-time sensing and processing of user input in tools that support:

- **Interactive fabrication** or **semi-automated fabrication**
- **CAD and 3D modeling,** including **AI-assisted modeling and generative design**
- **Augmented reality modeling and in-situ model visualization**

Your work will contribute to re-design how such tools capture, interpret, and respond to user input to support **precision, expressivity, and collaboration**. Your work will expand insights into input pipelines and refine technologies that are part of the INPUT project.

Main activities

Possible research directions include:

- **Adaptive filtering and control of user input** in fabrication tasks, such as digital motion control tools, gesture input, or tracking data of manually moved physical items.
- **Sensor signal processing and calibration techniques** for hybrid fabrication environments that combine physical tools, motion tracking, and digital controllers.

- **Predictive input systems** that anticipate user motion based on design intent to compensate for noisy analog to digital transformation of sensing signals, in support of semi-autonomous tool behavior.
- **Interactive systems for AI-assisted making**, where human and machine jointly contribute to the creation of physical artifacts.
- **Human-in-the-loop modeling tools** that let users refine or override automated suggestions in real time, supported by responsive input systems.
- **Design of new input techniques** tailored to creative or fabrication-specific workflows, including tangible, spatial, and AR-assisted interactions.

Skills

Required:

- PhD in Human-Computer Interaction, or a related field (defended after Sept 1, 2022).
- Demonstrated research experience in one or more of: digital fabrication, interactive systems,
- CAD software, physical computing, or human-AI collaboration in design.
- Strong programming skills (e.g., JavaScript, C++, Python, Unity, or embedded systems).
- Familiarity with prototyping interactive fabrication and design systems and conducting user studies.
- Experience with fabrication hardware (e.g., 3D printers, laser cutters, etc.).

Preferred:

- Interest in or prior work on creativity support tools, generative design, or mixed-reality interfaces.
- Knowledge of real-time input processing (e.g., filtering, prediction, control theory).

Benefits package

- Subsidized meals
- Partial reimbursement of public transport costs
- Leave: 7 weeks of annual leave + 10 extra days off due to RTT (statutory reduction in working hours) + possibility of exceptional leave (sick children, moving home, etc.)
- Possibility of teleworking and flexible organization of working hours
- Professional equipment available (videoconferencing, loan of computer equipment, etc.)
- Social, cultural and sports events and activities
- Access to vocational training
- Social security coverage

Remuneration

Gross salary by month : 2927 €

General Information

- **Theme/Domain :** Interaction and visualization
  Information system (BAP E)
- **Town/city :** Villeneuve d'Ascq
- **Inria Center :** Centre Inria de l'Université de Lille
- **Starting date :** 2025-11-01
- **Duration of contract :** 2 years
- **Deadline to apply :** 2025-06-01

Contacts

- **Inria Team :** LOKI
- **Recruiter :**
  Casiez Gery / Gery.Casiez@inria.fr

About Inria

Inria is the French national research institute dedicated to digital science and technology. It employs 2,600 people. Its 200 agile project teams, generally run jointly with academic partners, include more than 3,500 scientists and engineers working to meet the challenges of digital technology, often at the interface with other disciplines. The Institute also employs numerous talents in over forty different professions. 900 research support staff contribute to the preparation and development of scientific and entrepreneurial projects that have a worldwide impact.

Warning : you must enter your e-mail address in order to save your application to Inria. Applications must be submitted online on the Inria website. Processing of applications sent from other channels is not guaranteed.

Instruction to apply

- Detailed CV with a description of the PhD and a complete list of publications with the two most significant ones highlighted
- Motivation letter
- 2 letters of recommendations

Defence Security :
This position is likely to be situated in a restricted area (ZRR), as defined in Decree No. 2011-1425 relating to the protection of national scientific and technical potential (PPST).Authorisation to enter an area is granted by the director of the unit, following a favourable Ministerial decision, as defined in the decree of 3 July 2012 relating to the PPST. An unfavourable Ministerial decision in respect of a position situated in a ZRR would result in the cancellation of the appointment.

Recruitment Policy :
As part of its diversity policy, all Inria positions are accessible to people with disabilities.