2021-03647 - PhD Position F/M Grammars and Tools for Sketch-Driven Visualization Design

A propos du centre ou de la direction fonctionnelle

Located at the heart of the main national research and higher education cluster, member of the Université Paris Saclay, a major actor in the French Investments for the Future Programme (Idex, LabEx, IRT, Equipex) and partner of the main establishments present on the plateau, the centre is particularly active in three major areas: data and knowledge; safety, security and reliability; modelling, simulation and optimisation (with priority given to energy).

The 450 researchers and engineers from Inria and its partners who work in the research centre's 28 teams, the 60 research support staff members, the high-level equipment at their disposal (image walls, high-performance computing clusters, sensor networks), and the privileged relationships with prestigious industrial partners, all make Inria Saclay Île-de-France a key research centre in the local landscape and one that is oriented towards Europe and the world.

Contexte et atouts du poste

The Ph.D. thesis is fully funded by a collaboration research program between CNRS (France) and the University of Toronto (Canada). It will be co-supervised by Theophanis Tsandilas (https://www.lri.fr/~fanis) and Fanny Chevalier (http://fannychevalier.net). The thesis will primarily take place in France at the Université Paris-Saclay. However, we plan regular visits to Toronto for a total length of nine months, where travel expenses and accommodation will be fully funded.

The Ph.D. student will benefit from the interactions with other faculty and students in both institutions. The student will be a member of the EXSITU Inria team in Paris-Saclay and member of the Dynamics Graphics Lab (DGP) in Toronto, and will benefit from a vibrant and active laboratory with top researchers in the HCI and Computer Graphics fields.

The DGP lab at the Department of Computer Science at the University of Toronto is widely considered as one of the top and oldest HCI and Computer Graphics labs in the world, producing highly influential research since the 80s.

Recruitment details

The Ph.D. thesis can start any time between Sep 1 and Dec 1, 2021. Ph.D. theses in France last 3 years. To apply, please add your CV, a motivation letter, and any additional information that could make your application stand out: links to projects or interactive prototypes, research reports (e.g., Master thesis or paper) that demonstrate your research experience, etc. We will accept applications until the position is filled.

Mission confiée

Overview

Infographics are widely used to summarize complex data, illustrate problems and solutions, and tell stories over data. Our goal in this project is to investigate interactive tools and techniques that can help data journalists, infographic artists, and, by extension, data scientists and everyday people produce creative visualizations for communication purposes, e.g., to inform the public about the evolution of a pandemic, help novices interpret global-warming predictions, or enable people to reflect on their personal data [Lupi and Pocavec, 2018].

A key challenge for many infographic creators is how to conceive and implement original, fresh visual representations that highlight the unique properties of a dataset. Professionals commonly switch between sketches on paper and computers to reach a new visualization design [Landers and Heller, 2014]. Computer programs are powerful tools that help them generate creations keeping a direct binding with the underlying data. But many design experts first start by exploring visualization solutions through hand-drawn sketches. Before having access to the actual data, sketches can help them “visualize the architecture of the infographics and cultivate ideas for shaping the data visually,” while later, sketching with data can “help raise new questions about the data itself” [Lupi, 2015]. Such professional workflows provide inspiration for future visualization authoring tools with users who are not necessarily design experts.

Principales activités

Goal and expected outcomes

Unfortunately, current visualization systems target data-exploration and data-analysis tasks and fail to adapt to communication [Kosara, 2016] and design purposes [Bigelow, 2014]. The process of creating an original infographic can be extremely manual, involving multiple tools that are largely disconnected from the underlying data [Chevalier et al., 2018].

The goal of this Ph.D. thesis is to bring infographics design and visualization tools closer together [Cairo, 2012]. In particular, we want to address the more ambitious goal of computer-aided design that treats infographic creation as a visual-thinking process [Ware, 2008]. This process starts from sketches and progressively moves to data and generative parametric instructions, which can then re-feed the designer's sketches. We are also interested in how such tools can benefit users with no design expertise in different contexts, such as educators who want to instill data science and visualization knowledge through their own informal infographics, or common people who want to track and visually express their personal data [Lupi and Pocavec, 2018].

Expected results include: (i) a better understanding of how infographic artists iterate on their design sketches, (ii) techniques for semi-automatically extracting the relevant graphical properties of visualization sketches and structuring their constraints, (iii) techniques for reshaping sketch-driven visualizations, and (iv) interactive tools that allow users to design creative infographics.
References


Compétences

We are looking for candidates who are enthusiastic about conducting research at the intersection of Human-Computer Interaction, Information Visualization, and Computer Graphics. The candidate is expected to have a Master degree (M2-level for the French system), background in related fields, and ideally, previous experience with research. The candidate must have solid programming skills and be fluent in English (reading, writing, and oral). No knowledge of French is required.

Avantages

- 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 (after 6 months of employment) and flexible organization of working hours
- Professional equipment available (vide conferencing, loan of computer equipment, etc.)
- Social, cultural and sports events and activities
- Access to vocational training
- Social security coverage

Rémunération

1st and 2nd year : 1982 euros/Month
3rd year : 2.085 euros/Month

Informations générales

- Thème/Domaine : Interaction et visualisation
  Systèmes d'information (BAP E)
- Ville : Gif-sur-Yvette
- Centre Inria : CRI Saclay - Île-de-France
- Date de prise de fonction souhaitée : 2021-09-01
- Durée de contrat : 3 ans, 1 mois
- Date limite pour postuler : 2021-05-28

Contacts

- Equipe Inria : EX-SITU
- Directeur de thèse : Tsantilas Theofanis / Theophanis.Tsandilas@inria.fr

A propos d'Inria

Inria est l'institut national de recherche dédié aux sciences et technologies du numérique. Il emploie 2600 personnes. Ses 200 équipes-projets agiles, en général communes avec des partenaires académiques, impliquent plus de 3500 scientifiques pour relever les défis du numérique, souvent à l'interface d'autres disciplines. L'institut fait appel à de nombreux talents dans plus d'une quarantaine de métiers différents. 900 personnels d'appui à la recherche et à l'innovation contribuent à faire émerger et grandir des projets scientifiques ou entrepreneuriaux qui impactent le monde. Inria travaille avec de nombreuses entreprises et a accompagné la création de plus de 180 start-up. L'institut s'efforce ainsi de répondre aux enjeux de la transformation numérique de la science, de la société et de l'économie.

Consignes pour postuler
Sécurité défense :
Ce poste est susceptible d’être affecté dans une zone à régime restrictif (ZRR), telle que définie dans le décret n°2011-1425 relatif à la protection du potentiel scientifique et technique de la nation (PPST). L’autorisation d’accès à une zone est délivrée par le chef d’établissement, après avis ministériel favorable, tel que défini dans l’arrêté du 03 juillet 2012, relatif à la PPST. Un avis ministériel défavorable pour un poste affecté dans une ZRR aurait pour conséquence l’annulation du recrutement.

Politique de recrutement :
Dans le cadre de sa politique diversité, tous les postes Inria sont accessibles aux personnes en situation de handicap.

Attention: Les candidatures doivent être déposées en ligne sur le site Inria. Le traitement des candidatures adressées par d'autres canaux n'est pas garanti.