



Offre n°2024-07364

PhD Position F/M Interactive Public Dashboards for Explaining and Exploring Climate Change and Sustainability (IDP 2024)

Le descriptif de l'offre ci-dessous est en Anglais

Type de contrat : CDD

Niveau de diplôme exigé : Bac + 5 ou équivalent

Autre diplôme apprécié : Yes

Fonction : Doctorant

Niveau d'expérience souhaité : Jeune diplômé

Contexte et atouts du poste

The successful candidate will be part of the Inria team Bivwac (<https://www.bivwac.fr>). Weekly meetings between supervisor and student are expected, discussing process, problems, and next steps. It is expected that the candidate spends most of his time physically in the research lab.

Mission confiée

Organizations such as Agribalyse, NASA, or governments amass enormous amounts of data to track our environment and the impacts of our decisions. These data come in the form of satellite images, sensor data, model projections, measured averages and are likewise aggregated into higher-level key-performance-indicators (KPI). The sheer wealth of measures and data can overwhelm and requires bespoke setups and interventions to help people understand

- Which data, measures, and interaction exist?
- What do they say and how to interpret them?
- How to use the information to make data-driven decisions for citizens and organizations?

The goal of this project is to explore, develop, and evaluate applications for public dashboards to communicate and explore data around climate change and sustainability. Public dashboards are an emerging genre for information, decision making, and education. Inspired by the recent trend of public Covid19 dashboards, energy and climate dashboards in news magazines (e.g., <http://zeit.de>), and advances in immersive technologies such as mixed reality and large-wall displays [2], this project aims to explore the potential of large-wall public dashboards to help explain and explore data. For example, this project is a collaboration with NASA team for the Earth Now Dashboard (<https://svs.gsfc.nasa.gov/gallery/earth-now-dashboard>) that delivers near-realtime information about the earth based on NASA's own data and bespoke data visualizations. Such dashboards can be imagined in museums, town-halls, and other public spaces, but also as part of collaborative and participative expert decision making processes. Existing research on dashboards [3] and immersive spaces has so far ignored the aspect of explanations and lay people, having focused mainly on analytical expert scenarios.

However, designing public dashboards comes with serious challenges in the form of the following research questions.

Research question 1: What are effective visualizations understood by lay audiences and how can we design them? how can these visualizations be made effective and into a coherent dashboard design and experience? Addressing this question will require solutions to show data on a global level, finding effective visual representations for multivariate and temporal data, defining and visualizing KPIs and measures, and organizing these informations on a common display [4].

Research question 2: How to explain data and visualizations? Currently, dashboards are considered as pure interfaces to the data but without taking into account explanation and active explanation of its components [5]. However, we do not have good solutions to effectively explain the vast amount of information and visualization shown on such dashboards.

Research question 3: Interaction and personalization: What are effective means to allow people explore and personalize their dashboard experience? This question asks for novel technical solutions compatible

with large public dashboards, i.e., without interrupting other people engaging with the dashboard but providing some degree of collaboration. Within this project, we aim to explore using mixed and augmented reality to allow for interaction while augmenting and personalizing information shown on the dashboard display.

[1] M. H. Goldberg, A. Gustafson, and S. Van Der Linden. Leveraging social science to generate lasting engagement with climate change solutions. *One Earth*, 3(3):314–324, 2020

[2] Ens, B., Bach, B., Cordeil, M., Engelke, U., Serrano, M., Willett, W., ... & Yang, Y. (2021, May). Grand challenges in immersive analytics. In *Proceedings of the 2021 CHI Conference on Human Factors in Computing Systems* (pp. 1-17).

[3] Sarikaya, A., Correll, M., Bartram, L., Tory, M., & Fisher, D. (2018). What do we talk about when we talk about dashboards?. *IEEE transactions on visualization and computer graphics*, 25(1), 682-692.

[4] Bach, B., Freeman, E., Abdul-Rahman, A., Turkay, C., Khan, S., Fan, Y., & Chen, M. (2022). Dashboard design patterns. *IEEE transactions on visualization and computer graphics*, 29(1), 342-352.

[5] Riche, N. H., Hurter, C., Diakopoulos, N., & Carpendale, S. (Eds.). (2018). *Data-driven storytelling*. CRC Press.

Principales activités

Main activities:

- Analyse the requirements of partners, scenarios
- Read scientific literature
- Designing novel visualization and interaction techniques
- Evaluate visualization and interaction techniques
- Writing scientific papers

Additional activities:

- Implement visualization and interaction techniques
- Communicate research to project partners and research groups and at conference

Compétences

Technical skills and level required:

- Web-development
- Visualization development (D3, WebGL, mapbox, ...)

Languages:

- English, fluently

Relational skills:

- Interdisciplinary professionalism
- Communication skills

Other valued appreciated:

- Team-work
- Criticality and creativity

Avantages

- Subsidized meals
- Partial reimbursement of public transport costs
- 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

Rémunération

- 2100€ / month (before taxes) during the first 2 years,
- 2190€ / month (before taxes) during the third year

Informations générales

- **Thème/Domaine** : Interaction et visualisation
Plateformes expérimentales logiciel (BAP E)
- **Ville** : Talence
- **Centre Inria** : [Centre Inria de l'université de Bordeaux](#)
- **Date de prise de fonction souhaitée** : 2024-10-01
- **Durée de contrat** : 3 ans
- **Date limite pour postuler** : 2024-05-03

Contacts

- **Équipe Inria** : [BIVWAC](#)
- **Directeur de thèse** :
Bach Benjamin / Benjamin.Bach@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 215 équipes-projets agiles, en général communes avec des partenaires académiques, impliquent plus de 3900 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 200 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.

L'essentiel pour réussir

- Excitement about doing creative team-based research
- Creativity in visualization design
- Good communication skills
- Strong development skills
- Critical thinking and ability to agile work
- Design to understand tricky problems and seek novel solutions

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.

Consignes pour postuler

Thank you to send:

- CV
- Cover letter
- Master marks and ranking
- Support letter(s)

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.