The worldwide use of the Internet and social networking has transformed the constraints of time and space in human interaction: we can now be heard at a massive scale unprecedented in human history. As a result, ICT may enable citizens to undertake both government through direct assembly and collective action at a scale and an efficacy previously considered impossible. Our research concerns this opportunity to leverage a new sort of political life. We focus specifically on how software systems may enable participatory democracy, that is, the participation of citizens in democratic assembly, action, and governance.

Toward the above, we investigate supporting middleware infrastructures that in particular enable universal social networking so as to allow citizens to engage using their favorite online social network services. The resulting middleware is called SocialBus and is released under open source license (at https://gitlab.inria.fr/usnb/universal-social-network-bus). The candidate should be interested in contributing to the development of distributed systems, from design to prototype implementation and experiment.

**Incentive mechanisms for participatory systems** have been studied extensively in the literature. Indeed, these are two essential elements for connecting people with their environment and communities, which may serve sustaining people's participation across time.

**References**
- Emil Andriescu, Thierry Martinez, Valérie Issarny. Composing Message Translators and Inferring their Data Types using Tree Automata. FASE 2015: 18th International Conference on Fundamental Approaches to Software Engineering, 2015, LNCS. https://hal.inria.fr/hal-01097389.
- Valérie Issarny, Vivien Mallet, Kinh Nguyen, Pierre-Guillaume Raverdy, Fadwa Rebhi, Raphael Ventura. Dos and Don'ts in Mobile Phone Sensing Middleware: Learning from a Large-Scale Experiment. The 2016 International Middleware Conference. https://hal.inria.fr/hal-01366610.
- Rafael Angarita, Nikolaos Georgantas, Valérie Issarny. USNB: Enabling Universal Online Social Interactions. IEEE International Conference on Collaboration and Internet Computing, 2017. Best paper award https://hal.inria.fr/hal-01591757.

**Informations générales**
- **Thème/Domaine :** Systèmes distribués et intergiciels
- **Système & réseaux (BAP E)**
- **Ville :** Paris
- **Centre Inria :** CRI de Paris
- **Date de prise de fonction souhaitée :** 01-10-2018
- **Durée de contrat :** 3 ans
- **Date limite pour postuler :** 23-04-2018

**Contacts**
- **Équipe Inria :** MIMOVE
- **Recruteur :** Issarny Valérie / valerie.issarny@inria.fr

**L’essentiel pour réussir**
The candidate should be interested in contributing to the development of distributed systems, from design to prototype implementation and experiment.

Interest in social networking and social sciences is obviously a plus.

**Conditions 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 de l’arrêté de recrutement.

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

**Mission confiée**
In the above context, a key challenge of our work lies in providing the right incentive for people to engage and keep getting involved.

Overcoming such a challenge through the study of relevant middleware support that may be reused across participatory systems is the focus of the PhD.

**Principales activités**
Incentive mechanisms for participatory systems have been studied extensively in the literature. Building upon the research background of the Inria MIMOVE team, the PhD will more specifically focus on the study of solutions that leverage mobile networking and the IoT. Indeed, these are two essential elements for connecting people with their environment and communities, which may serve sustaining people’s participation across time.

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**Contexte et atouts du poste**
The world-wide use of the Internet and social networking has transformed the constraints of time and space in human interaction: we can now be heard at a massive scale unprecedented in human history. As a result, ICT may enable citizens to undertake both government through direct assembly and collective action at a scale and an efficacy previously considered impossible. Our research concerns this opportunity to leverage a new sort of political life. We focus specifically on how software systems may enable participatory democracy, that is, the participation of citizens in democratic assembly, action, and governance.

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**Principales activités**
Incentive mechanisms for participatory systems have been studied extensively in the literature. Building upon the research background of the Inria MIMOVE team, the PhD will more specifically focus on the study of solutions that leverage mobile networking and the IoT. Indeed, these are two essential elements for connecting people with their environment and communities, which may serve sustaining people’s participation across time.
The PhD work will in particular consider the following research questions:

- **How to leverage the IoT for participatory systems**: The objective here is to enrich the exchange among citizens through the provision of relevant observations from the physical environment. Things may further extend to “social things” (e.g., social bots) that autonomously communicate with the engaged citizens so as to foster interaction among them, while preserving their respective privacy.

- **How to support the continuous engagement of nomadic users**: Despite the increased capacity of smartphones, connectivity and relative resource constraints, esp. wrt energy, remain the norm. It is thus essential to customize protocols for the mobile case so that citizens are able to engage any-time, any-where, when that is the most relevant with respect to the purpose of the given participatory system.

To address the above questions, the PhD work will decompose into:

- State of the art survey of participatory systems and their applications, with a special focus on systems oriented toward participatory democracy, to become familiar of the overall topic of participatory systems and select a specific use case for experimental validation.
- Design of incentive mechanisms and supporting middleware protocols for participatory systems that leverage observations from both “physical” and “social” things, while preserving the required security and privacy properties.
- Customization of the proposed mechanisms for the mobile context.
- Prototype implementation of the above solutions as part of the SocialBus middleware.
- Evaluation of the proposed solutions.

**Compétences**

Technical skills and level required: Master degree in Computer Science or Computer Engineering is required. Programming skills.

Languages: Fluency in English is required; it is not necessary to speak French.

Relational skills: Team spirit is essential

Other valued appreciated: Autonomy.

**Avantages sociaux**

- Subsidised catering service
- Partially-reimbursed public transport

**Rémunération**

Gross Salary per month: 1 982 € the first 2 years and 2 085 € the last year