Offer #2025-09119

PhD Position F/M Anatomy of smartphone software obsolescence

Contract type : Fixed-term contract

Level of qualifications required : Graduate degree or equivalent

Fonction : PhD Position

Level of experience : Recently graduated

About the research centre or Inria department

The Inria Lille - Nord Europe research centre, created in 2008, has a staff of 360, including 305 scientists in 15 research teams. Recognised for its strong involvement in the socio-economic development of the Hauts-De-France region, the Inria Lille - Nord Europe research centre pursues a close relationship with large companies and SMEs. By promoting synergies between researchers and industrialists, Inria participates in the transfer of skills and expertise in digital technologies and provides access to the best European and international research for the benefit of innovation and companies, particularly in the region.

For more than 10 years, the Inria Lille - Nord Europe centre has been located 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

The proposed PhD is part of the ANR ObsoMobile project “Deconceiving smartphone obsolescence”, in collaboration with the LIRIS (Lyon) and ACCRA (Strasbourg) laboratories.

The aim of this thesis is to investigate the software factors leading to the renewal of mobile terminals, more specifically iOS and Android smartphones. It will be broken down into a quantitative phase involving the collection and analysis of data documenting the operation of mobile applications on more or less recent phones, a qualitative phase involving interviews with mobile development players, and a retrospective phase involving a synthesis of the knowledge acquired through this study.

Regular travel will be required: to Strasbourg and Lyon to meet our partners, and

to national and international symposia and conferences to exchange ideas with the scientific community.
Travel expenses will be reimbursed in accordance with current rates.

Assignment

The proposed PhD is part of the ANR ObsoMobile project “Deconceiving smartphone obsolescence”, in collaboration with the LIRIS (Lyon) and ACCRA (Strasbourg) laboratories.

The aim of this thesis is to investigate the software factors leading to the renewal of mobile terminals, more specifically iOS and Android smartphones. It will be broken down into a quantitative component of data collection and analysis documenting the operation of mobile applications on more or less recent phones, a qualitative component of interviews with players in mobile development, and a retrospective phase synthesizing the knowledge gained from this study.

State of the art :

- [1] É. Lees Perasso, C. Vateau, et F. Domon, « Evaluation environnementale des équipements et infrastructures numériques en France », mars 2023. Consulté le: 14 mars 2024. [En ligne]. Disponible sur: https://www.arcep.fr/la-regulation/grands-dossiers-thematiques-transverses/lempreinte-environnementale-du-numerique/etude-ademe-arcep-empreinte-environnemental-numerique-2020-2030-2050.html
- [2] ARCEP, « Renouvellement Des Terminaux Mobiles et Pratiques Commer-
- ciales de Distribution », juin 2021. Consulté le: 12 mars 2024. [En ligne].
- Disponible sur:
https://www.economie.gouv.fr/files/files/2021/20210709_Rapport_
- Renouvellement_terminaux_mobiles_pratiques_commerciales.pdf
- [3] L. Magnier et R. Mugge, « Replaced Too Soon? An Exploration of Western European Consumers' Replacement of Electronic Products », Elservier Resources, Conservation and Recycling, 2022, doi: 10.1016/j.resconrec.2022.106448.
- [4] L. Mosesso, N. Maudet, E. Nano, T. Thibault, et A. Tabard, « Obsolescence Paths: living with aging devices », in IEEE International Conference on ICT for Sustainability (ICT4S), juin 2023. doi: 10.1109/ICT4S58814.2023.00011.
- [5] L. Wei, Y. Liu, et S.-C. Cheung, « Taming Android fragmentation: characterizing and detecting compatibility issues for Android apps », in IEEE/ACM International Conference on Automated Software Engineering (ASE), 2016. doi: 10.1145/2970276.2970312.
- [6] P. Laperdrix, W. Rudametkin, et B. Baudry, « Beauty and the Beast: Diverting Modern Web Browsers to Build Unique Browser Fingerprints », in IEEE Symposium on Security and Privacy (S&P), 2016. doi: 10.1109/SP.2016.57.
- [7] M. Gómez, Towards Improving the Quality of Mobile Apps by Leveraging Crowdsourced Feedback. University of Lille / Inria, France, 2016.
- [8] S. Habchi, Understanding Mobile-Specific Code Smells. University of Lille / Inria, France, 2019.
- [9] M. Colmant, Multi-Dimensional Analysis of Software Power Consumptions in Multi- Core Architectures. University of Lille / Ademe, France, 2016.
- [10] A. Rule, A. Tabard, et J. D. Hollan, « Exploration and Explanation in Computational Notebooks », in ACM Conference on Human Factors in Computing Systems (CHI), 2018. doi: 10.1145/3173574.3173606.

Main activities

Main activities:

- Analysis of the state of the art in computer science, design and social sciences concerning mobile obsolescence.
- Acquisition of data on mobile application support on various platforms and versions
- Static and dynamic analysis of mobile applications to assess malfunctions
- Conducted interviews with mobile development teams
- Synthesis of results, writing of thesis manuscript

Additional activities:

- Produce synthesized results of work
- Communicate orally and in writing about your work in various contexts (informal seminars, scientific journals and conferences, etc.).
- Propose tasks to achieve the above-mentioned objectives

Skills

- Master degree in Informatics, preferably with a Software Engineering specialty
- Knowledge in mobile software development and ecosystem: primarily Android, iOS appreciated
- Interest for Science & Technology Studies (STS) research, sociology, psychology, and obviously Software Engineering research
- Eagerness to conduct and analyse directed interviews with a diverse public, including but not limited to mobile software developers and smartphone users of different backgrounds
- Capacity to synthesize academic literature
- Communication skills, written and oral, in French & English
- Autonomy, initiative

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

2 200 € monthly gross salary

General Information

- **Theme/Domain :** Distributed programming and Software engineering Software engineering (BAP E)
- **Town/city :** Villeneuve d'Ascq
- **Inria Center :** Centre Inria de l'Université de Lille
- **Starting date :** 2025-10-01
- **Duration of contract :** 3 years
- **Deadline to apply :** 2025-08-22

Contacts

- **Inria Team :** SPIRALS
- **PhD Supervisor :**
  Luxey Adrien / adrien.luxey@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

Please send your CV and cover letter

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.