PHD Position on Diversity in Security Threat Analysis and Risk Assessment

Job post in short

We are seeking this post to create theoretical knowledge of the key diversity factors in the technical domain of software security and risk analysis in the real world. To this aim, we are looking for a highly motivated and innovative candidate with a background in **computer science / software engineering & architecture / security and risk analysis** to tackle the investigation of diversity effects in threat analysis and risk assessment.

Job title:	Ph.D. Candidate
Salary:	€2,395 PM (first year) up to €3,061 PM
Faculty/Department:	Faculty of Science, Dept. of Computer Science
Campus location:	Amsterdam, The Netherlands
Responsible to:	dr. Katja Tuma, k.tuma@vu.nl
Key working relationships:	Supervisor, other members of the research group and department, such as academic staff and students
Contract type:	Full-time, Fixed-term of 4 years. To start ASAP
Application requires:	1) CV, 2) motivation letter, 3) relevant diplomas, 4) transcript of records, 5) proof of advanced knowledge of English
Application due:	October 30, 2021; apply here

Threat Analysis and Risk Assessment

Threat analysis and risk assessment are routinely performed in organizations by experts to identify and mitigate **security risks** early-on in the **software** development life-cycle. This includes a systematic account of possible security attacks, attacker motives, state of the art security controls, and company assets. Due to its manual execution, the quality of the analysis heavily depends on the human analyst. Yet, little **empirical evidence** exists about human **diversity** factors (such as gender, country of origin, group composition) and their effects on threat and risk analysis procedure and outcomes.

Do you want to advance the state of the art in this interdisciplinary topic?

Then, the Foundational and Experimental Security group of the Vrije Universiteit Amsterdam has a vacancy for a PhD project to empirically study the effect of diversity factors on the execution of popular techniques to analyze security threats and risks in IT systems.

Job description

Threat and risk analysis methods require a good understanding of security risk on the design level (confidentiality breach in a data store), as well as code-level vulnerabilities and attacks (e.g., DDOS). This birds-eye perspective is invaluable to industry as well as academia. Therefore, the candidate will have the opportunity to engage with researchers in different disciplines and have an actual impact on the state of practice.

The interesting aspect of this project is its interdisciplinary flavor. Diversity theory and team dynamics will be the narrative backbone of the candidates' research. The project will require the candidate to conduct empirical research, such as literature survey, diversity training, and controlled experiments including human participants. Through scientific rigour and combining security engineering and technical knowledge, the candidate will contribute to top publication venues in the field and have an opportunity to work on meaningful challenges and generate actual societal impact.

Key responsibilities:

- To **design and conduct** experimental and empirical studies, possibly including controlled experiments, descriptive and observational studies, case studies with industrial partners, interview and survey studies
- To work part of a **team** of fellow researchers and students, share research ideas, results, and effectively communicate progress to produce top quality results
- **Re-use existing knowledge** from the domains of secure software design, risk analysis, empirical methods in software engineering, and diversity theory to address novel research challenges
- Identify and **capture the human-aspects** of software engineering practices (i.e., diversity factors in threat analysis and risk assessment)
- To develop the necessary empirical **protocols and measures** and package them for *non-technical re-use* (e.g., for study replications from other research fields)
- Perform **statistical analysis** of collected data using most relevant languages and tools (R, Python,...)
- **Writing scientific publications** as the main driving force and as co-author, attending international conferences and workshops to **present own work** and maintain up-to date with latest research findings

- **Teaching assistance** for Computer Science BSc and/or MSc programme courses

Requirements

We are looking for applicants who have an outstanding education that is roughly equivalent to a MSc in Computer Science, Software Engineering, or other related topics with a proven interest in any of the above areas. We accept applications from students who have not yet completed their master thesis but plan to do so within a few months.

Essential requirements:

- MSc degree in Computer Science, Software Engineering or related field **OR** ongoing Master student in Computer Science, Software Engineering or related field, close to completion (few months)
- Some previous experience involving software security (preferably risk/security analysis of software architecture/design)
- Solid knowledge of programming languages for statistical analysis (R, Python,...)
- Statistical and analytical skills
- A keen interest in interdisciplinary research in the area of diversity in computer science
- Fluency in speaking and writing in the English language and good communication skills (interpersonal and presentation skills)
- (Ideally) Some experience analyzing data collected with human participants
- (Ideally) Knowledge of designing and conducting empirical studies

What are we offering?

A challenging position in a socially involved organization. The salary will be in accordance with university regulations for academic personnel and amounts €2,395 (PhD) per month during the first year and increases to €3,061 (PhD) per month during the fourth year, based on full-time employment. The job profile is based on the university job ranking system and is vacant for at least 0.8 FTE.

The appointment will initially be for 1 year. After a satisfactory evaluation of the initial appointment, the contract will be extended for a total duration of 4 years.

Additionally, Vrije Universiteit Amsterdam offers excellent fringe benefits and various schemes and regulations to promote a good work/life balance, such as:

- a maximum of 41 days of annual leave based on full-time employment
- 8% holiday allowance and 8.3% end-of-year bonus
- solid pension scheme (ABP)
- a wide range of sports facilities which staff may use at a modest charge

About Vrije Universiteit Amsterdam

The ambition of Vrije Universiteit Amsterdam is clear: to contribute to a better world through outstanding education and ground-breaking research. We strive to be a university where personal development and commitment to society play a leading role. A university where people from different disciplines and backgrounds collaborate to achieve innovations and to generate new knowledge. Our teaching and research encompass the entire spectrum of academic endeavour – from the humanities, the social sciences and the natural sciences through to the life sciences and the medical sciences.

Vrije Universiteit Amsterdam (ranks 115 in the World University Ranking 2022, published by Times Higher Education) is home to more than 26,000 students. We employ over 4,600 individuals. The VU campus is easily accessible and located in the heart of Amsterdam's Zuidas district, a truly inspiring environment for teaching and research.

Diversity
We are an inclusive university community. Diversity is one of our most important values. We believe that engaging in international activities and welcoming students and staff from a wide variety of backgrounds enhances the quality of our education and research. We are always looking for people who can enrich our world with their own unique perspectives and experiences.

The Faculty of Science
The Faculty of Science inspires researchers and students to find sustainable solutions for complex societal issues. From forest fires to big data, from obesity to medicines and from molecules to the moon: our teaching and research programmes cover the full spectrum of the natural sciences. We share knowledge and experience with leading research institutes and industries, both here in the Netherlands and abroad.

Working at the Faculty of Science means working with students, PhD candidates and researchers, all with a clear focus on their field and a broad view of the world. We employ more than 1,250 staff members, and we are home to around 6,000 students.

Application

Are you interested in this position? Please apply via the application button here and upload your curriculum vitae and cover letter until **October 30th, 2021**.

Applications received by e-mail will not be processed.

Vacancy questions
If you have any questions regarding this vacancy, you may contact:

Name: dr. Katja Tuma
Position: Assistant Professor
E-mail: k.tuma@vu.nl