Research Assistant Positions:
Diversity in Threat Analysis and Risk Assessment

We are looking for **two** highly motivated and innovative research assistants with either a background in **computer science / software engineering & architecture / security and risk analysis** <u>OR</u> a background in **social sciences / organizational sciences / diversity and group dynamics** to tackle the investigation of diversity effects in software security practices, such as threat analysis and risk assessment.

Appointment

The project will be carried out in Amsterdam in collaboration between the Faculty of Science and Faculty of Social Sciences. The position is for **0.2 FTE (1 day/week)** and will run for **10 months**. The <u>**starting date is October 1st, 2021**</u>.

Application

Please apply by sending an email to k.tuma@vu.nl and r.vander.lee@vu.nl until **September 15th**. In your email state briefly your interest in the topic and attach your CV.

About the project

Threat analysis and risk assessment is often performed in organizations to identify and mitigate security risks early-on in the software development life-cycle. Despite efforts of automation, teams of experts still manually analyze large architectural diagrams and discuss security threats in practice. During these discussions risk decisions must be made in face of uncertainties for which an adequate statistical bias is not available, leaving room for subjective judgements. The technical quality of analysis outcomes (e.g., coverage of identified security threats) is essentially determined by expert judgement. But, evidence of "groupthink" in safety analysis sessions suggests that knowledge is not always contributed (equally) by all participants, and exact variables that affect the technical quality of the analysis are not yet understood.

Previous research has focused on observing diversity factors and group performance in achieving technically trivial tasks (e.g., perception of risk). On the other hand, research on threat analysis and risk assessment methodologies were focused on measuring quantitative performance of teams in terms of analysis outcomes but have neglected the human factors that come into play.

Our aim is to characterize the key differentiating factors of diversity processes (e.g., gender, country of origin, group composition) in threat analysis and risk assessment, experimentally evaluate their effects in a non-technical context (as baseline), develop context-specific diversity interventions, and empirically validate them in a realistic (technical) environment. The key identified factors of diversity processes in the analysis of sophisticated technical artefacts will be of relevance to the security risk analysis research community, as they may help reshaping existing methodologies and technique processes to facilitate diversity. The developed and validated diversity interventions will have an impact on the security training of professionals within organizations and higher-education of computer science and engineering students.

Job description

Through an interdisciplinary approach combining security engineering and technical knowledge (CS component) and organizational & social psychology knowledge (SC component) the research assistants will define and carry out a research project seeking to identify key differentiating factors of diversity in threat analysis and risk assessment, and how the analysts can successfully incorporate diversity into their daily work, ultimately improving the quality of the analysis.

Your duties

Students should ideally have some previous experience in carrying out research related tasks, including writing scientific reports. Both students need to have a deep interest in the interdisciplinary topic of the project and must be willing to work together and share ideas.

Responsibilities of student A (CS)

- Conduct a literature study in threat and risk analysis, particularly the related literature on the experimentation with such techniques
- Prepare material and design a pilot study with students from a social science masters course
- Assess the collected data & perform a statistical analyses of the results
- Collaboratively design a diversity intervention as a result from the findings of pilot study

Responsibilities of student B (SS)

- Study the related literature from the social science domain, particularly studies on diversity processes in technical domains
- Run the pilot study & collect data in a social sciences master course
- Support student A in the result analysis
- Collaboratively design material for a diversity intervention as a result from the findings of pilot study

Requirements

Student A

- Ongoing (research) Master student (or exceptional last year Bachelor student provided they meet other requirements) in Computer Science, Software Engineering or related field
- Some previous experience with software security (preferably risk/security analysis of software architecture)
- Solid knowledge of programming languages for statistical analysis (R, Python,...)
- (Ideally) some experience analyzing data collected with human participants

Student B

- Ongoing (research) Master student (or exceptional last year Bachelor student provided they meet other requirements) in Organizational Sciences, Social Psychology or related field

- Some previous experience in a technical domain (preferably basic understanding of security concepts in an IT setting and/or notion of risk)
- Solid knowledge of methods for statistical analysis
- (Ideally) some experience analyzing data collected with human participants

Both students

- Knowledge of designing empirical (field or experimental) studies, advanced statistical and analytical skills, and a keen interest in interdisciplinary research in the area of diversity in computer science
- Fluency in speaking and writing in the English language

Questions?

If you have further questions regarding this vacancy, you may contact k.tuma@vu.nl and r.vander.lee@vu.nl.