1st SCORE Workshop on Software Testing

29 March 2022 – Salón de Actos Edificio Celestino Mutis

The world is increasingly driven by software, being a key part of most disruptive innovations, such as autonomous vehicles, virtual reality, or crypto currencies. However, poor software applications can have dramatic consequences in term of usability, security, money, and even people safety. It is therefore crucial to have the right tools for the development of high-quality software systems that meet user requirements and budget constraints. Software engineering research at SCORE focuses on the development of techniques and tools for the development of more efficient, effective, and reliable software applications

In this workshop, we will review some the most recent advances of SCORE members on the field of software testing. These include promising tools for the automated detection of faults that have allowed us to detected hundreds of bugs in industrial web APIs such as Amadeus, Spotify, and YouTube. We will review some promising applications at the intersection between software testing and artificial intelligence to automate some of the testing tasks currently perform by humans. We will also present the potential of repository mining to understand the use of testing techniques and tools in practice. Besides this, we will review the state of the art on the automation of GUI tests for mobile apps and we will present some related work conducted by SCORE members. Finally, we will show the potential of metamorphic testing for revealing bugs in cyber physical systems.

We are honoured to have Dr Javier Troya (University of Malaga) as the keynote speaker, who will talk to us about testing and debugging of model transformations.

Program	
09:00 - 10:30	Sergio Segura. Opening
	Alberto Martin-Lopez. Online testing of RESTful APIs: Finding Hundreds of Bugs.
	Giuliano Mirabella. Active learning-driven testing of RESTful APIs.
	Juan Carlos Alonso. Automated generation of test oracles for RESTful APIs.
	Ana B. Sánchez. Mutation testing in practice
Coffee break (45 minutes)	
11:15 - 12:15	**Keynote speech** Javier Troya. Model Transformation Testing and Debugging
	José A. Parejo. Automating the GUI testing for mobile apps: problems and solutions
Break (15 minutes)	
12:30 - 13:15	Saman Barakat. Automated analysis of inter-parameter dependencies in RESTful APIs and their applications.
	Sergio Segura. Performance metamorphic testing of cyber-physical systems.
	Sergio Segura. Closing

Keynote speech

Title: Model Transformation Testing and Debugging

Abstract: Model-Driven Engineering (MDE) advocates models as first-class entities throughout the system life cycle. It is meant to increase productivity by maximizing automation and interoperability, simplifying the design process and promoting communication between stakeholders. The use of MDE principles and techniques is growing, being well established, for instance, in the development of embedded and production systems. Model transformations are the key technique in MDE to manipulate and construct models. Therefore, the correctness of software systems built with MDE approaches relies mainly on the correctness of model transformations, and thus, detecting and locating bugs in model transformations have been popular research topics in recent years. There is a vast literature on model transformation testing and debugging, which makes it challenging to gain a comprehensive view of the current state of the art. This is an obstacle for newcomers to this topic and MDE practitioners to apply these approaches.

In this talk, Javier will introduce the concepts of model transformation, software testing, and how model transformations are typically tested. Also, he will present some results of a survey on model transformation testing and debugging that is based on the analysis of 140 papers on the topic.

Short Bio: Javier works as an Associate Professor at the University of Malaga (Spain), where he received a PhD in Software Engineering in 2013. He is a member of the Atenea Research Group, integrated in the Institute of Technology and Software Engineering. Between 2013 and 2015 he joined the Business Informatics Group at TU Wien (Austria), and between 2016 and 2020 he joined the Applied Software Engineering research group at the University of Seville (Spain). Javier was awarded in 2020 with the I3 Certificate by the Spanish Ministry of Science, Innovation and Universities. He has coauthored some papers published in top-tier journals, for which he also serves as regular reviewer. His current research interests focus on model transformation testing, uncertainty modeling and digital twins.

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