

Dear Readers,

Welcome to the third issue of the TUTORIAL newsletter, where you will find all the details of recent events and upcoming activities for this exciting project. The aim is to provide you with up-todate project results and information relevant to the ongoing research collaboration between the consortium partners Tallinn University of Technology (TUT), Delft University of Technology (TU Delft), Polytechnic University of Turin (POLITO), Deutsches Zentrum fuer Luft- und Raumfahrt EV (DLR) and Intelligentsia Consultants.

TUTORIAL is funded by the European Commission's Horizon 2020 programme, with an overall aim to *strengthen the scientific excellence and innovation capacity in the field of nanoelectronics based dependable cyber-physical systems* of Tallinn University of Technology.

Over the course of the project, the partners have spent three years organizing numerous international collaborations in the form of staff exchanges, summer schools, conferences and training workshops. In its final year, we would like to thank you for sharing TUTORIAL's scientific innovation journey with us.

We hope that you enjoy your reading and continue to stay updated on the consortium's achievements in the future.

TUTORIAL Team









Staff Exchanges



Ten short-term visits including one junior researcher visit from TUT to TU Delft were carried out with the goal of training in new CPS technologies and data analysis methods. The research visits between the two partners increased significantly and yielded strong collaboration and training opportunities in three main cooperation topics: memory aging mitigation techniques (which finally resulted in a common publication [1]), training in memristor and compute-in-memory technologies and cost-efficient methods for attention tracking in human computer interaction (resulting in two new publications) as well as starting the new cooperation on emerging hardware security topics between the TUT and TU Delft groups. In total, the result of the collaboration between TUT and TU Delft resulted in 4 publication.

Partly supported by the collaboration of TUT and TU Delft in TUTORIAL, the partners also participated in a successful Marie Sklodowska-Curie ITN RESCUE proposal coordinated by TUT. The project launched in April 2017. In December, there was a common TUTORIAL-RESCUE workshop organised in Rotterdam by TU Delft.



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Staff Exchanges



In its final year, training between TUT and POLITO included Training and education in this period targeted towards integrating the know-how of TUT and POLITO. Their primary knowledge exchange involved a case study on applying the in-field test methods jointly developed in TUTORIAL to realistic use cases in safety-critical domains. To achieve this, these partners focused on the following topics during their staff exchanges: Reconfigurable networks validation, safe fault identification for safety-critical systems, network on chip reliability, and automated test program generation. The case study resulted with the creation of an architecture, based on TUT's Bonfire network on chip and POLITO's OpenRISC based processor design was created and the methods of both teams were benchmarked on it. As part of the process, training of TUT's PhD student Stephan Adeboye in the area of safe faults analysis took place.

In total, TUT greatly benefitted frm their exchange with POLITO, as reflected in their extensive staff visits to their Italian consortium partner. In all, their collaboration has yielded five joint publications.



Staff Exchanges



During the final year of TUTORIAL, the project had very active staff exchanges between both TUT and DLR. The topics included training on fault tolerant algorithms in space CPSs and on DLR's CPS simulation environment. The main education and training which took place between the partners was to educate TUT researchers on the DLR's satellite on-board-computing infrastructure and to evaluate the new verification, reliability and debug approaches jointly developed by DLR and TUT on the DLR's satellite on-board-computing infrastructure. TUT's senior researcher, Dr Artur Jutman spent several visits to Bremen to receive training of testing space systems while in return, DLR's researchers focused on the topic of research training in CPS simulation and networked CPS testing/property generation from Tallinn.

As result of these visits, the collaboration between TUT and DLR resulted in a total of 6 publications during the TUTORIAL project.



8th Biannual European - Latin American Summer School on Design, Test and Reliability

June 20-22, 2018, Tallinn, Estonia

3rd Summer School **BELAS 2018**

In celebration of the 5th anniversary of BELAS, the final TUTORIAL summer school was hosted by TalTech through the 8th annual European-Latin American Summer School on Design, Test and Reliability, which took place from 20-22 June 2018. During this three-day session, the following nine different scientific tutorials were presented by invited international experts from Cyprus, Brazil, Estonia, France, Mexico, Iran and the USA.

In addition to the lectures, the agenda also offered a soft skills tutorial, "Ethical writing: a crash course for PhDs", prepared by the IT Faculty at TalTech. This was an informative session which focused on the essential and acceptable practices in publishing for researchers, with an emphasis on providing examples and thought experiments of solving hypothetical ethical dilemmas.

To foster discussions between young researchers and the experts in attendance, all PhD and MSc students were encouraged to present their current scientific results or recent work through poster sessions. This was an excellent opportunity for students to receive feedback and input from the experienced lecturers and senior attendees.

More information of this event (including abstracts) is available <u>here</u>.





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Training workshops: TUTORIAL Space Conference

TUTORIAL Space Conference (December 13th, 2018)

Held at the Mektory Innovation and Business Centre in Tallinn, The TUTORIAL Space Conference took place on the 13th December 2018. It was a collaboration between DLR and TALTECH to engage participants in the latest satellite-based technologies relevant to the needs of the space sector. In total, there were 31 participants who took part in the Space Conference from different Estonian organisations such as Testonica Lab OU and TALTECH as well as several attendees from DLR







TALTECH organised a one-day workshop for its researchers called "Training in TALTECH for applying to European science grants" on the 18th December 2018. This full-day session was a comprehensive look into the potential H2020 funding schemes which would be directly relevant to the work of researchers. It included a combination of interactive and informative modules featuring the different techniques useful in proposal writing preparation and training in transferable skills. It was designed specifically for young researchers interested in applying for individual fellowships but also provided an overview for institutions interested in forming a consortium for EU-funded projects. The main objective was to provide knowledge and competencies for developing research and development projects under international calls with real-life proposal examples and introduce potential funding opportunities for early-stage and experienced researchers.

The purpose of the session was to stimulate the innovative and entrepreneurial capacity of participants, bridging their academic expertise with practical approaches for potential collaborations with other research institutions, industry partners, private/public sector and the general public. The attendees actively participated by planning their own individual research and development projects and employing strategies for developing a competitive proposal, which they also presented and received feedback for. In total, 18 participants attended this TALTECH training workshop.



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The Test Spring School was organised by the European Test Symposium in cooperation with the TUTORIAL project between the 25th-28th May 2018. This three-day event was held at Etelsen Castle (Langwedel) near Bremen, Germany and was specifically tailored for PhD and Master students to focus on the scientific domains relating to modern safety and security technology. It offered state of the art design, test, verification and validation techniques tackling safety and security. Held in conjunction with the 23rd IEEE European Test Symposium, DLR also served as part of the organising committee during this event. Several TUTORIAL and invited experts presented lectures on the following topics:

Test Spring Schoo

Functional Safety from Component to the Cloud: R. Mariani, Intel Corporation In-field Test for Functional Safety: M. Sonza Reorda, POLITO Hardware Security and Cryptography Essentials: I. Verbanwhede, KU Leuven Manufacturing Test of Secure Devices: Threats Introduced by Test Infrastructures G. Di Natale, LIRMM Track A : Automotive Test for Functional Safety: Y. Zorian, Synopsys Armenia

Track B: Embedded System Security: Cryptographic Challenges and Physical Threats T. Gunesyu, Ruhr-Universitat Bochum

More details regarding this event are available here





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