Faculty of Electronics and Information Technology and Faculty Aeronautics and Power Engineering jointly organise a seminar in the series of Scientific Meetings of the Polish Chapter of the IEEE Robotics&Automation Society

"Deterministic Executable Models for Dependable Autonomous Systems"

Dr René Hexel – Griffith University, Australia

28 September 10.15am – room 569 – Faculty of Electronics and Information Technology

The advent of increasingly powerful computing devices in the world of embedded systems has seen a rapid transition from traditional control systems to highly complex systems whose behaviour is guided by complex algorithms from the realm of artificial intelligence, such as machine learning and goal-driven task planning. Unfortunately, many of the benefits brought by such systems come at the expense of dependability, particularly when it comes to operating in safety-critical real-time environments. The presentation will discuss techniques that promise to integrate the best of both worlds, allowing to model highly complex systems in a way that allows failure-mode effects analysis (FMEA), formal verification, model checking, and fault handling.

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Dr René Hexel has been a leading researcher in software engineering of safety-critical real-time systems. His achievements include methodologies for modelling, model-checking, evaluation, and validation of safety-critical systems, including failure mode effects analysis (FMEA) through fault injection. Dr Hexel has influenced establishing underlying principles in real-time communication protocols now in widespread use, such as FlexRay and TTP (now an industry standard deployed in the Airbus A380 and the Boeing 787 Dreamliner). He has been a key contributor towards the specification of TTP, a time-triggered communication protocol for safety-critical, fault-tolerant real-time systems. His current research work focuses on the application of the above principles towards Software Engineering and Complex Distributed Systems with the ultimate goal to establish a more robust and reliable way of how safety critical systems are developed and deployed tomorrow.

Dr Hexel is Deputy Head of School of ICT at Griffith University. He is Co-Director of the Machine Intelligence and Pattern Analysis Lab (MiPal) under the umbrella of the Institute for Integrated and Intelligent Systems (IIIS), a Class-A University Research Institute. Dr Hexel is the Griffith University CI and local coordinator of the PANTHER project, a research collaboration and mobility project funded under the EU Erasmus Mundus program.