Program REMARO Summer School Delft 2022

TU Delft Faculty of 3mE, The Netherlands, **June 27-28**

Control, System and Software Architecture for Autonomous Underwater Robots

Monday, June 27, 2022 - Advanced Control and Perception, Pulse - 33, Hall 6 map

Advanced Control (**Erdal Kayacan, Aarhus University**)		
9:00		Walk-in badge pick up and coffee
9:50		Welcome and School by Carlos Hernandez and Andrzej Wasowski (REMARO Coord,)
10:00	10:45	Differences between the behavior of linear and nonlinear systems, Equilibrium behaviour (Static, dynamic, closed orbit (periodic), limit cycle)
10:45	11:15	Lyapunov's indirect method
Coffee Break		
11:30	12:30	Lyapunov's direct method, System analysis based on Lyapunov's Direct method, Control design based on Lyapunov's direct method (feedback linearization, sliding mode control)
Lunch 12:30		
Underwater vision & localisation: precision and reliability (**Michal Kozlowski**)		
13:00	13:30	Sensor Modalities for Navigation
13:30	13:50	Underwater Sensing Modalities & Perception
14:00	14:50	State Estimation and Inertial Navigation
Coffee Break		
15:00	15:50	Examples of Localisation underwater (Vision)
15:50	16:00	Wrap-up discussion
18:00	19:00	**Boat tour** in the historic city Center of Delft. The boat departs from Koornmarkt 113 at 18:00 sharp. More info on: https://www.rondvaartdelft.nl/en/

Tuesday, June 28, 2022 – Robot Software Architecting: from Systems Engineering to Self-Adaptation, Pulse - 33, Hall 6 map

Model-based robot software architecting (Jose Luis Fernandez, and Carlos Hernandez, TUD)		
9:00	9:45	Model-Based Systems Engineering
9:45	10:30	The ISE&PPOOA methodology for MBSE
Coffee Break		
10:45	11:40	Functional Architecture with the ISE&PPOOA methodology
11:45	12:30	Guest talk: *Self-aware autonomous robots* (Joris Sijs, TNO)
Lunch 12:30		
Self-Adaptive Software Architectures		
13:15	13:45	Software Architecture with the ISE&PPOOA methodology (C. Hernandez)
13:45	14:45	How to architect your robot software (Ivano Malavolta, VU Amsterdam)
Coffee Break		
15:00	16:00	Self-Adaptive Systems (Ilias Gerostathopoulos, VU Amsterdam)
16:00	16:30	Metacontrol: MBSE+SAS (Carlos Hernandez)
16:30	17:00	Wrap-up school and farewell