

The Chair of Information-oriented Control (ITR) is seeking for a

PhD candidate or PostDoc in "Shared control"

with primary application to underwater robotics. The successful candidate will participate in the research project "*Search, Identification and Collection of Marine Litter with Autonomous Robots*" (SeaClear) supported by the EU Horizon2020 program, working on shared / cooperative control between (semi-)autonomous systems and human operators.

Project description: Today's oceans contain 26-66 million tons of waste, with approximately 94% located on the seafloor. So far, collection efforts have focused mostly on surface waste, with only a few local efforts to gather underwater waste, always using human divers. No solution exists that exploits autonomous robots for underwater litter collection; the SeaClear project will develop the first. We will create a mixed team of Unmanned Underwater, Surface, and Aerial Vehicles — UUV, USV, UAV — to find and collect litter from the seabed and from the water column, focusing on coastal areas since that is where waste inflow concentrates. The UAV and one or several inspection UUVs map the litter, aiming to establish correlations between surface and underwater litter. One or multiple collection UUVs then classify and collect litter, using a combined suction-gripper manipulator for both small and large waste. The UUVs are tethered to offload power and computation to the USV. Our objective is to operate the robots autonomously, without remote human intervention, and to that end we plan novel developments in debris mapping, classification, and robot control.

For this project, we are seeking a motivated and talented researcher with strong disciplinary background in control and mechatronics and a strong interest to work in an interdisciplinary environment. Additionally, the candidate should have good knowledge in robotics and optimization as well as strong software development skills, experience in teleoperation is beneficial. Candidates should have very good English language skills, knowledge of German is not mandatory.

The position is fully paid according to the German rules (13 TV-L). Requirements are a successful degree (master/diploma/doctoral/PhD) with exceptional records.

Please send your application including your complete CV, grades, relevant certificates, and some of your publications in a single pdf file by email to

office@itr.ei.tum.de with the keyword 'SeaClear-SharedControl'.

TUM is especially encouraging minorities and women to apply, because of its strong commitment to diversity in engineering education, research, and practice.

We are looking forward to hearing from you.

Technical University of Munich

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