Three joint vacant PhD positions within the fields of distributed cooperative control, distributed statistical estimation & numerical optimization, and underwater acoustic communications, The Departments of Engineering Cybernetics and of Electronic Systems at the Norwegian University of Science and Technology (NTNU) in Trondheim, Norway.

The Departments of Engineering Cybernetics and of Electronic Systems at the Norwegian University of Science and Technology (NTNU) in Trondheim, Norway, have three joint vacant PhD positions within the fields of distributed cooperative control, distributed statistical estimation & numerical optimization, and underwater acoustic communications, with deadline 31st of March.

The positions are within the Norwegian Research Council project "Autonomous Underwater Fleets", starting in August 2020, and whose focus is on enabling fleets of Autonomous Underwater Vehicles (AUVs) to operate collectively, cooperatively, adaptively, and in a leaderless fashion, so to enable more efficient & reliable monitoring and utilization of sea resources & infrastructures.

The three PhD positions will focus on approaching theoretical, algorithmic and practical problems relative to, respectively,

1) developing distributed leaderless control strategies for multi-AUV systems that can autonomously replan the mission objectives if necessary and on the fly by leveraging on sensors readings from all the AUVs,

2) develop distributed optimization and estimation algorithms that establish inter-AUVs information exchange and mixing mechanisms that deal with packet losses, communication delays, channel asymmetries, drifts of the communication clocks, and little-to-none knowledge about the topology of the communication networks,

3) develop adaptive communication schemes for underwater vehicles that can adapt their transmission and reception schemes according to both the current status of the fleet and the current underwater channel conditions.

The project will be executed under the supervision of professors Kristin Y. Pettersen (acting as main supervisor for sub-project 1), Damiano Varagnolo (acting as main supervisor for sub-project 2), and Hefeng Dong (acting as main supervisor for sub-project 3) from NTNU, of Dr. Claudio Paliotta from Sintef Digital, and of Prof. Joao Tasso de Sousa, University of Porto. The project will be integrated in the Centre of Excellence on Autonomous Marine Operations and Systems (CoE NTNU AMOS) and will build on & strengthen the established cooperation in marine robotics and autonomy with NTNU AMOS partners, e.g., Equinor and DNV GL. The main workplaces will be the Departments of Engineering Cybernetics and of Electronic Systems at the Norwegian University of Science and Technology (NTNU) in Trondheim, an equal opportunity employer described in detail at https://www.ntnu.edu/itk. The project will give the opportunity to pay extended visits to Porto, Portugal, and to other Universities, research institutes or companies, potentially also outside Europe.
The qualification requirement is completion of a master's degree with a grade of B or better in terms of NTNU's grading scale in one of the following fields: Engineering Cybernetics, Control systems, Mechanical Engineering, Underwater Acoustics, Communication, Signal Processing, or equivalent education. Persons with knowledge within nonlinear systems theory, statistical methods, numerical optimization, autonomous systems, underwater acoustic communications, networks, and experience with instrumentation are particularly encouraged to apply. Good written and oral English language skills are a non-negotiable prerequisite. Moreover, since the goal of the project is to bring the concept of cooperative robotics into the underwater realm by simultaneously advancing and merging different scientific fields, the PhD students will have to work as a closely cooperating team.

The starting date is preferably August 2020, but a little flexibility in this date is allowed. The employment period is 3 years, with the possibility of extending the contract for maximum one year by serving maximum 25% of the employment time for teaching duties. The PhD candidate salary is normally NOK 449400 before tax per year; from the salary, 2% is deducted as a contribution to the Norwegian Public Service Pension Fund. Applications are to be submitted through https://www.jobbnorge.no/en/available-jobs/job/183782/phd-position. All applications will be treated in the strictest confidence. For more information, please contact damiano.varagnolo@ntnu.no.

Note moreover that our research has civilian objectives. However, equipment that is restricted by export licenses and ITAR (International Traffic in Arms Regulations) is being used in the research project. Applicants that are citizens of Norway, Australia, Japan, New Zealand, Switzerland, EU or NATO countries are eligible. Other applicants, instead, in order to be considered for the position are required to provide evidence of eligibility to use such equipment and attach this evidence in their application.

*** deadline: March 31st, 2020. Moreover, the applicants should specify in their cover letter which (one or more) of these PhD projects they apply for ***