SPECIAL GUEST SPEAKER:

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Hyperspectral smallsat for ocean observation (HYPSO) and related UAV research

The HYPer-Spectral smallsat for Ocean observation (HYPSO) is developed to observe oceanographic phenomena from a 6U cube satellite with a push-broom hyperspectral imager (HSI), and intelligent on-board processing in collaboration with aerial, surface and underwater robots. The launch of the HYPSO-1 satellite is planned for December 2020. Of special interests are plankton and algal blooms that are related to primary production and threats to fisheries and aquaculture. Through slewing the spacecraft when above the targeted oceanographic area the satellite will achieve a higher ground sampling distance which in turn will be used in super-resolution techniques to increase the spatial resolution of the images. The concept promises increased spatial, temporal and spectral resolution compared to currently available data products, but only for selected areas of meso-scale (100 km). Moreover, we intend to demonstrate that customized data products for harmful algal bloom (HAB) tracking can be delivered to end users within minutes, on an S-band datalink with relatively low data-rate. The FPGA-based onboard processing chain is essential to enable all of this. The in-house designed HSI is produced using COTS components and exists in different version, where low-cost/low-weight versions for UAV applications are produced using 3D-printing.

Tor Arne Johansen received the MSc degree in 1989 and the PhD degree in 1994, both in electrical and computer engineering, from the Norwegian University of Science and Technology, Trondheim, Norway. From 1995 to 1997, he worked at SINTEF as a researcher before he was appointed Associated Professor at the Norwegian University of Science and Technology in Trondheim in 1997 and Professor in 2001. He has published several hundred articles in the areas of control, estimation and optimization with applications in the marine, aerospace, automotive, biomedical and process industries. In 2002 he co-founded the company Marine Cybernetics AS where he was Vice President until 2008. Prof. Johansen received the 2006 Arch T. Colwell Merit Award of the SAE, and is currently a principal researcher within the Center of Excellence on Autonomous Marine Operations and Systems (NTNU-AMOS) and director of the Unmanned Aerial Vehicle Laboratory at NTNU and the SmallSat Laboratory at NTNU. He recently co-founded the spin-off companies Scout Drone Inspection, UBIQ Aerospace and Zeabuz.

When:
10 February, 2020
13:00 - 14:00

Where:
Sydney Nanoscience Hub (A31)
Lecture Theatre 3003
The University of Sydney

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