

# **Drone Technological Opportunities: UAS Ability - Research Infrastructure and use of drones for data collection**

**DTU Space Polar Conference  
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# Program

- SDU UAS Center
- Research Projects
- Infrastructure Fund
- UAS-Ability Project
- Technical Challenges and Research Opportunities

# SDU UAS Center

University of Southern Denmark's Center for UAS brings together experts in robotics, computer vision, physics, software engineering, mechanical engineering, and cyber-physical systems to focus on research, education, innovation, and collaboration in the UAS domain.

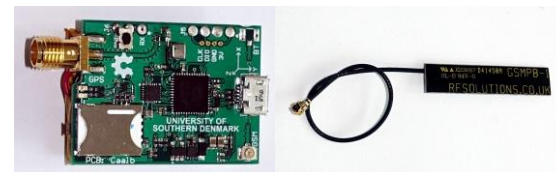
[www.sdu.dk/uascenter](http://www.sdu.dk/uascenter)

# Research Projects

- Research
  - FreeD: Innovation Fund (2016-2020), BVLOS Solution
  - Ecodrone: GUDP (2016-2017), Agriculture Demonstration
  - Drone ID: TBST (2015-2016), 2nd Phase (2016-2017)
  - BVLOS Fast Track (DEC 2016)
    - Infrastructure, Maritime, Agriculture, Denmark Emergency Management Agency
  - SDU Lighthouse Project (2016-2019)
    - TEK, NAT, SAMF, SUND, HUM



*Ecodrone*



*DroneID*

# Education and Innovation

- Education
  - MSc Robot Technology/Drone Specialization
- Innovation and Collaboration
  - Innovation på vinger: Industriens Fund (2016-2019)
    - Hans Christian Andersen Airport

# Danish Roadmap for Research Infrastructures 2015



Ministry of Higher Education  
and Research  
—  
Danish Agency for Science,  
Technology and Innovation

## UAS-ability

Research infrastructure for the use of unmanned  
aerial systems (drones) for data collection

The proposal is to establish a research infrastructure for the development of drone technology, integration and use of drones in research, especially for data collection within the field of climate and environment. The research infrastructure will be located at three specialized centres in Denmark: one for the development of drone technology at University of Southern Denmark, one for the integration of drone technology at Aarhus University and one for drone-based research at Aalborg University.

The research infrastructure will form the basis for locating Danish research in drone technology enhancement and will facilitate increased and more efficient use of drones for research. The expectation is that drone technology will ultimately enhance and ease data collection – especially in severely accessible regions – notably for use in climate, energy and environmental research. Drones may, for instance, be employed in studies of climate change impacts on the Arctic, environmental monitoring of Denmark's coast, or thermographic analysis of energy loss in buildings. At the same time, in connection with the research infrastructure, there will be a focus on drone operator training.

Industrial and innovation sector players will participate in working parties under the research infrastructure with a view to preparing requirements specifications and a directory of services offered by the facilities. Industry will benefit from using the facilities independently or via partnerships and will engage in technology development. For the purpose of knowledge transfer, the expectation is that the facilities will host conferences and other drone operator training. The potential for economic growth is expected to arise out of technology development and drone production together with opportunities for spin-off enterprises and the ability to attract foreign companies to Denmark.

Type  
(date issued)

Principal proposer:  
University of Southern Denmark  
Gordon Rømer Møllerberg, Head  
of Institute, Ørsted Ris Vindenergi  
Institute Institute

The proposers:  
Technical University of Denmark,  
Danish Biotechnological Institute  
(DBI), ØSTLIS – Danish  
Electronics, Light & Acoustics, Uni-  
versity of Copenhagen, Aalborg  
University and Aarhus University

Other interested and potentially  
informed parties

Airbus, Danish Georegistry Map-  
ping Agency, Sea and emergency  
services, Boeing, Gentoo, Danish  
Aviation System, Danish Institute  
of Fire and Security Technology  
(DFST), Easysat, PUSC Technology,  
Danish Graduate Agency, HCA Air-  
port, My Drone Communication,  
Danish Agriculture Agency, Danish  
Police Agency, Naviair, Odense  
Municipality, Danish Security and  
Intelligence Service, Roskilde, Es-  
kov Center, SCEN LAG, Sky Watch,  
Danish Technological Institute  
(TEMA), Danish Transport and  
Infrastructure Agency, UAS Inter-  
mark, UAS Test Center Denmark,  
Danish Road Directorate, ViaCopter  
and Wafel

Estimated total investment  
requirements:  
Approx. EUR 42-43 million



Danish Agency for Science, Technology and Innovation

# UAS-Ability

- National Committee for Research Infrastructures (NUFI)
  - 30 mio DKK Investment
  - 34 mio DKK Co-finance
- Development of Drone Technology, Integration, and Use
  - Focus on research in the environment and climate



# UAS-Ability cont'd

- Mobile Ground Control Station
- Platforms and payloads
- Data collection, storage, and analysis
- Development Laboratories
  - 2200 square meter facility at Hans Christian Andersen Airport
  - Composite materials research and testing
  - Systems integration: Hardware and software in the loop, system, environment, operation simulation
  - Three-dimensional ground-based sense and avoid radar







# Technical and Research Opportunities

- LiDAR Bathymetry
- Drone-based Gravimeters
- Drone-based Magnetometer Measurements
- Air quality measurements





# Questions?

