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## Research Interests

I am an associate professor in Engineering working at the University of Southern Denmark. I am passionate about novel technology and technological innovation for the benefit of society. My research interests are robotics and other complex cyber-physical systems. My current work spans the areas of sensing and perception, wireless sensor networks and autonomous drone risk assessments, failsafe systems and aerial collision avoidance.

## Teaching portfolio

### Educational view

What makes a talented engineer? I believe he or she possess good theoretical and professional skills and in addition a number of generic skills such as the ability to work analytically and methodically, to think creatively and innovative and to work in inter-disciplinary teams. To embrace these skills I see myself as a facilitator of learning, rather than an expert who feeds knowledge to the students. In my teaching I try therefore to support the students in achieving these skills themselves, and to encourage them to take responsibility for their own learning.

My approach is often laboratory-based and project oriented teaching. I find that this motivates the engineering students and I often receive positive feedback in the form of new inspiration, great ideas to alternative approaches etc. not to mention the students' enthusiasm. This is very motivational to me as well.

### Teaching experience

I have since 2017 taught the mandatory courses UAS Technology (Spring semester) and Unmanned Aircraft Systems Design (Fall semester) for the UAS Technology Master specialization. Before this I have taught the courses Robot Systems Design, Expert in Teams, Introduction to UAS Technology, Design and Development of Field Robots for Plant Nursing.

Since 2014 I have contributed to the supervision of 4 PhD students, I have supervised 22 MSc students (hereof 5 as co-supervisor), 2 Diploma students, 11 BSc students and 4 individual student projects. The majority of these have been in UAS technology and some in Field Robotics and Internet of Things (IoT).

During 2015 and 2016 I was teaching UAS technology as part of the new drone pilot certificate introduced in Denmark at that time. This activity was in support to the UAS Flight Academy established at HCA Airport. Students were employees from the industry and organizations.

### Other educational activities

I have been part of the education committee for Robotics since 2014. In this role I have made key contributions to the establishment of a MSc specialization in UAS technology. Initially I established a 5 ECTS elective interdisciplinary course in drone technology conducted in the Spring 2015. Based on the results I contributed to establishing a Master specialization in UAS technology. My contributions included curriculum design, developing course descriptions for all new courses, negotiations with various stakeholders etc. The Master specialization became a reality in the Fall 2015.

In 2014-2015 I played a major role in the redesign of the course Robot Systems Design (RSD) for 9th semester robotics students. The aim of the course was to enable the students to implement a complex industrial robotic installation using the knowledge and experience they have gained throughout their study. The course previously focused on industrial robotics only. My contribution to this redesign process was the inclusion of mobile robots to transport production parts in the industrial environment and collaborate with the industrial robots. This development of the course content was welcomed by both representatives from the industry and the students, as this resembled the current state of the art.

### Educational training

I have in 2015 completed the SDU University Lecturer Training Programme. I have in 2016 been certified as Teaching in English competency at C1 level in spoken English.

## Publications

### Towards Autonomous Multi-UAV U-Space Operation Planning

Grøntved, K. A. R., Jepsen, J. H., Christensen, A. L., Jensen, K., Schultz Lundquist, U. P. & Campusano, M., Jun 2024, *2024 International Conference on Unmanned Aircraft Systems (ICUAS)*. IEEE, p. 929-934 (Proceedings of International

Conference on Unmanned Aircraft Systems).

**Effect of distributing locally produced cloth facemasks on COVID-19-like illness and all-cause mortality-a cluster-randomised controlled trial in urban Guinea-Bissau**

Nanque, L. M., Jensen, A. M., Diness, A., Nielsen, S., Cabral, C., Cawthorne, D., Martins, J. S. D., Ca, E. J. C., Jensen, K., Martins, C. L., Rodrigues, A. & Fisker, A. B., Feb 2024, In: PLOS Global Public Health. 4, 2, 16 p., e0002901.

**Airspace Advisory Service: Towards Detect and Avoid for UAS Operators Utilizing the Traffic Information Service**

Jepsen, J. H., Eduardo-Teomitzi, H., Tørsleff, S. & Jensen, K., 2024, *2024 International Conference on Unmanned Aircraft Systems (ICUAS)*. IEEE, p. 538-545 (Proceedings of International Conference on Unmanned Aircraft Systems).

**Airspace Situational Awareness: Proposed Airspace Safety Concepts & State-of-the-art Review of UAS Aircraft Detection Technologies**

Maalouf, G., Jensen, K. & Jepsen, J. H., 2024, *2024 International Conference on Unmanned Aircraft Systems (ICUAS)*. IEEE, p. 1393-1400 (Proceedings of International Conference on Unmanned Aircraft Systems).

**A survey of state-of-the-art U-space research**

Jepsen, J. H., Laursen, K. H. & Jensen, K., 2024, *2024 10th International Conference on Automation, Robotics and Applications (ICARA)*. IEEE, p. 265-272 (International Conference on Automation, Robotics and Applications).

**Experimental Results of Utilizing the 3GPP LTE Positioning Protocol for Providing RTK Reference Data to High-Accuracy UAV Operations**

Jepsen, J. H., Gunnarsson, F., Wen, R., Wase, J. & Jensen, K., 2024, *2024 International Conference on Unmanned Aircraft Systems (ICUAS)*. IEEE, p. 53-60 (Proceedings of International Conference on Unmanned Aircraft Systems).

**Investigating the applicability of LTE-M for Network Identification of Unmanned Aerial Systems in U-Space**

Jepsen, J. H., Mader, A. R., Andreassen, T. D., Singh, R. & Jensen, K., 2023, *2023 International Conference on Unmanned Aircraft Systems (ICUAS)*. IEEE, p. 616-625 (Proceedings of International Conference on Unmanned Aircraft Systems).

**Safely Flying BVLOS in the EU with an Unreliable UAS**

Terkildsen, K. H., Schultz, U. P. & Jensen, K., 19. Jul 2021, *Proceedings of the 2021 International Conference on Unmanned Aircraft Systems (ICUAS)*. IEEE, p. 591-601 9476834

**Towards SORA-Compliant BVLOS Communication**

Andersen, F. M., Terkildsen, K. H., Schultz, U. P. & Jensen, K., 19. Jul 2021, *Proceedings of the 2021 International Conference on Unmanned Aircraft Systems (ICUAS)*. IEEE, p. 1509-1519 9476768

**UAVAT Framework: UAV Auto Test Framework for Experimental Validation of Multirotor sUAS Using a Motion Capture System**

Jepsen, J. H., Terkildsen, K. H., Hasan, A., Jensen, K. & Schultz, U. P., 19. Jul 2021, *Proceedings of the 2021 International Conference on Unmanned Aircraft Systems, ICUAS 2021*. IEEE, p. 619-629 9476699

**Towards a Service-Oriented U-Space Architecture for Autonomous Drone Operations**

Campusano, M., Jensen, K. & Schultz, U. P., 2021, *2021 IEEE/ACM 3rd International Workshop on Robotics Software Engineering (RoSE)*. IEEE, p. 63-66

**Towards Declarative Specification of Multi-Drone BVLOS Missions for UTM**

Campusano, M., Heltner, N., Molby, N., Jensen, K. & Schultz, U. P., Nov 2020, *2020 Fourth IEEE International Conference on Robotic Computing (IRC)*. IEEE, p. 430-431

**A Methodology for evaluating Commercial Off The Shelf parachutes designed for sUAS failsafe systems**

Tofterup, V. K. & Jensen, K., 15. Aug 2019, *2019 International Conference on Unmanned Aircraft Systems (ICUAS)*. IEEE, p. 129-137

### **Model-Based Fail-Safe Module for Autonomous Multirotor UAVs with Parachute Systems**

Hasan, A. I., Tofterup, V. K. & Jensen, K., 15. Aug 2019, *Proceedings of the International Conference on Unmanned Aircraft Systems, ICUAS*. IEEE, p. 406-412

### **Towards a Tool for Assessing UAS Compliance with the JARUS SORA Guidelines**

Terkildsen, K. H. & Jensen, K., 15. Aug 2019, *2019 International Conference on Unmanned Aircraft Systems (ICUAS)*. IEEE, p. 460-466

### **Towards a Weather Analysis Software Framework to Improve UAS Operational Safety**

Lundby, T., Christiansen, M. P. & Jensen, K., 14. Jun 2019, *Proceedings of the 2019 International Conference on Unmanned Aircraft Systems, ICUAS 2019*. IEEE, p. 1372-1380 204

### **A Survey of Open-Source UAV Flight Controllers and Flight Simulators**

Ebeid, E. S. M., Skriver, M., Terkildsen, K. H., Jensen, K. & Schultz, U. P., 1. Sept 2018, In: *Microprocessors and Microsystems*. 61, p. 11-20

### **Safety system for mowers and mower with such a safety system**

Green, O. (Inventor), Jæger, C. L. D. (Inventor), Springer, K. (Inventor), Jensen, K. (Inventor), Steen, K. A. (Inventor), Larsen, M. (Inventor), Simonsen, T. (Inventor) & Linding, J. G. (Inventor), 22. May 2018, IPC No. A01D 75/ 18 A I, Patent No. DK201670951, Priority date 30. Nov 2016, Priority No. DK2016PA70951

### **Increasing the motivation of high school students to pursue engineering careers through an application-oriented active learning boot-camp**

Jensen, K., Dyrmann, M. & Midtby, H. S., May 2017, *Exploring Teaching for Active Learning in Engineering Education: Book of Abstracts*. p. 135 1 p.

### **Small UAS identification and tracking in Denmark**

Skriver, M. & Jensen, K., 17. Mar 2017, 4 p.

### **Dicotyledon Weed Quantification Algorithm for Selective Herbicide Application in Maize Crops**

Laursen, M. S., Jørgensen, R. N., Midtby, H. S., Jensen, K., Christiansen, M. P., Mosgaard Giselsson, T., Mortensen, A. K. & Jensen, P. K., 4. Nov 2016, In: *Sensors*. 16, 11, 29 p.

### **Rule-based Dynamic Safety Monitoring for Mobile Robots**

Adam, M. S., Larsen, M. (Member of author group), Jensen, K. (Member of author group) & Schultz, U. P., Jul 2016, In: *Journal of Software Engineering for Robotics*. 7, 1, p. 120-141

### **Drone Identification and Tracking in Denmark**

Jensen, K., Skriver, M. & Schultz, U. P., 2016, Syddansk Universitet. Mærsk Mc-Kinney Møller Institutet. 56 p.

### **A novel low-cost mobile robot for rapid prototyping of precision farming applications**

Jensen, K., Neerup, M. M., Larsen, L. B. & Maagaard, J., 24. Nov 2014. 1 p.

### **Towards Rule-Based Dynamic Safety Monitoring for Mobile Robots**

Adam, M. S., Larsen, M., Jensen, K. & Schultz, U. P., 20. Oct 2014, *Simulation, Modeling, and Programming for Autonomous Robots: 4th International Conference, SIMPAR 2014, Bergamo, Italy, October 20-23, 2014. Proceedings*. Brugali, D., Broenink, J. F., Kroeger, T. & MacDonald, B. A. (eds.). Springer, p. 207-218 (Lecture Notes in Computer Science, Vol. 8810).

### **Commercial autonomous agricultural platform: Kongskilde Robotti**

Green, O., Schmidt, T., Pietrzowski, R. P., Jensen, K., Larsen, M. & Jørgensen, R. N., 21. May 2014, *Proceedings of the Second International Conference on Robotics, Associated High-Technologies and Equipment for Agriculture and Forestry: New trends in mobile robotics, perception and actuation for agriculture and forestry*. RHEA, p. 351-356 5 p.

### **An Application-oriented Open Software Platform for Multi-purpose Field Robotics**

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### **Sensor-based assessment of herbicide effects**

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### **Towards an Open Software Platform for Field Robots in Precision Agriculture**

Jensen, K., Larsen, M., Nielsen, S. H., Larsen, L. B., Olsen, K. S. & Jørgensen, R. N., 2014, In: Robotics. 3, 2, p. 207-234

### **Autonomous Precision Spraying Trials Using a Novel Cell Spray Implement Mounted on an Armadillo Tool Carrier**

Jensen, K., Stigaard Laursen, M., Midtby, H. & Jørgensen, R. N., 3. Jul 2013.

### **Extracurricular Activities Targeted towards Increasing the Number of Engineers Working in the Field of Precision Agriculture**

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### **Evaluating the portability of the FroboMind architecture to new field robot platforms**

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### **Evaluating the performance of a low-cost GPS in precision agriculture applications**

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### **First results: Robot mapping of areas contaminated by landmines and unexploded ordnance**

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### **Robots using ROS: ASuBot**

Jensen, K., 27. Oct 2011

### **Terrain Mapping and Obstacle Detection using Gaussian Processes**

Kjærgaard, M., Massaro, A. S., Bayramoglu, E. & Jensen, K., Oct 2011. 6 p.

### **Complete coverage path planning of a random polygon - A FroboMind component**

Aslund, S., Jensen, K. & Jørgensen, R. N., 30. Jun 2011. 6 p.

### **FroboMind, proposing a conceptual architecture for agricultural field robot navigation**

Jensen, K., Bøgild, A., Nielsen, S. H., Christiansen, M. P. & Jørgensen, R. N., 30. Jun 2011. 6 p.

### **Implementations of FroboMind using the Robot Operating System framework**

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### **Localization in orchards using Extended Kalman Filter for sensor-fusion - A FroboMind component**

Christiansen, M. P., Jensen, K., Ellekilde, L.-P. & Jørgensen, R. N., 30. Jun 2011. 4 p.

### **Work in progress: Robotics mapping of landmine and UXO contaminated areas**

Jensen, K., Jørgensen, R. N., Bøgild, A., Jørgensen, O. J., Nielsen, S. H. & Persson, R. B., 26. May 2011. 7 p.

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