

Kjeld Jensen
The Maersk Mc-Kinney Moller Institute
SDU UAS Centre
Postal address:
Campusvej 55
5230
Odense M
Denmark
Email: kjen@mmmi.sdu.dk
Mobile: 42802580
Phone: 42802580



Research areas

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

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. Sep 2018, In : *Microprocessors and Microsystems*. 61, p. 11-20

Safety system for mowers and mower with such a safety system

Green, O., Jæger, C. L. D., Springer, K., Jensen, K., Steen, K. A., Larsen, M., Simonsen, T. & Linding, J. G., 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., Jensen, K. & 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

Jensen, K., 4. May 2014, Syddansk Universitet. Det Naturvidenskabelige Fakultet. 241 p.

Sensor-based assessment of herbicide effects

Streibig, J. C., Rasmussen, J., Andújar, D., Andreasen, C., Berge, T. W., Chachalis, D., Dittmann, T., Gerhards, R., Giselsson, T. M., Hamouz, P., Jaeger-Hansen, C., Jensen, K., Jørgensen, R. N., Keller, M., Stigaard Laursen, M., Midtby, H., Nielsen, J., Müller, S., Nordmeyer, H., Peteinatos, G. & 4 others, Papadopoulos, A., Svendgaard, J., Weis, M. & Christensen, S., 2014, In : Weed Research. 54, 3, p. 223–233

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

Larsen, L. B., Stark Olsen, K., Ahrenkiel, L. & Jensen, K., 3. Jul 2013. 12 p.

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

Jaeger-Hansen, C., Jensen, K., Larsen, M., Nielsen, S. H., Griepentrog, H. W. & Jørgensen, R. N., Jul 2013.

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

Jensen, K., Larsen, M., Simonsen, T. & Jørgensen, R. N., 19. Sep 2012. 6 p.

A low cost, modular robotics tool carrier for precision agriculture research

Jensen, K., Nielsen, S. H., Bøgild, A., Jørgensen, O. J., Jæger-Hansen, C. L., Jul Jacobsen, N. & Jørgensen, R. N., 15. Jul 2012. 13 p.

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

Jensen, K., Larsen, L. B., Olsen, K. S., Hansen, J. & Jørgensen, R. N., 24. Apr 2012. 7 p.

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

Nielsen, S. H., Bøgild, A., Jensen, K., Kjærhus Bertelsen, K. & Jørgensen, R. N., 30. Jun 2011. 4 p.

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.

Feasibility study of a plant nursing robot performing weeding operations

Sørensen, C. A. G., Green, O., Nørremark, M., Jørgensen, R. N., Jensen, K., Maagaard, J. & Jensen, L. A., 2009, *Proceedings of the NJF Seminar*. Nordic Association of Agricultural Scientists