

## Undervisnings CV

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SDU UAS Center  
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## Undervisningsområder

Datateknologi  
Elektronik  
Embedded Software  
Signalintegritet, EMI & EMC  
Robotteknologi  
Velfærdsteknologi  
Signalbehandling  
Reguleringsteknik  
Træningsteknologi  
System On Chip  
FPGA

## Employment

**The Maersk Mc-Kinney Moller Institute**  
SDU  
Odense M  
21. Nov 2023 → present

### Associate Professor

SDU UAS Center  
SDU  
Odense M, Denmark  
21. Nov 2023 → present

## Undervisningserfaring

Jeg har deltaget i planlægning af universitetsundervisning siden jeg som formand for de datateknologiske studenrede forening FADSO, i perioden 1993-95 tog initiativ til et række omfattende reformforslag, der via de studerendes arbejde i studienævnet næsten alle blev gennemført. Jeg har efterfølgende (2003) stået for planlægningen af 2 overbygningsprofiler til civilingeniøruddannelsen i datateknologi (senere robotteknologi), og selv stået for undervisningen af de fleste kurser på "Embedded systems" indtil 2006.

Jeg har vejledt universitetsstuderende siden jeg som studerende grundlagde "Hardware interessegruppen" i 1995. Jeg deltog som instruktør på sommerkurset i AGV teknologi ved SDU i 1997. Senere overtog jeg ansvaret for kurset som PhD. stipendiat i 1999, 2000 og senere som adjunkt. Kurset har i den periode anvendt min specialerapport "Praktisk AGV konstruktion" som lærebog på kurset.

Jeg har udviklet civilingeniøruddannelsen i velfærdsteknologi, og efterfølgende gradvist flyttet min undervisning fra datateknologi & robotteknologi til denne uddannelse.

Parallelt med traditionel undervisning har jeg en stor rolle som vejleder fra bachelor til Ph.D. niveau. Jeg har erfaring med vejledning i spændet mellem Datateknologi, Elektronik, Robotteknologi og velfærdsteknologi.

## Nuværende kurser

Fysisk interaktiv Software

Cyber Physical interfacing

Dynamiske systemer

Reguleringsteknik

## Vejledning

Phd Vejledning: Datateknologi & Robotteknologi

Speciale Vejledning: Datateknologi, Robotteknologi & Velfærdsteknologi

Bachelor/diplom vejledning: Datateknologi, Elektronik, Robotteknologi & Velfærdsteknologi

## Pædagogisk grundsyn

Praktisk forståelse af relevant teori gennem anvendelse i vedkommende problemstillinger. Den studerendes egen erkendelse af sammenhænge mellem teori og praksis er afgørende, hvorfor en adaptation af den Sokratiske metode er foretrukket.

Jeg lægger vægt på personlig udvikling af den enkelte studerende gennem integration af dyb grundfaglig forståelse og dyb problemforståelse. Levendegørelse af stoffet gennem et udgangspunkt i konkrete og virkelige problemer, hentet fra igangværende forsknings- eller udviklingsprojekter. Fokus på at tænke teoretiske værktøjer ind i de enkelte studerendes fagområde eller interesseområde. Aktivering af stoffet gennem anvendelse i praksis og afmystificering gennem relation til kendte områder, og gennem anvendelse af personlig erfaring, erkendelse og humor.

Metodisk og principiel og formidlingsmæssig hovedinspiration: Lao Tze, Sokrates, Marcus Porcius Cato, Søren Kirkegaard, Richard Feynman, Howard Gardner, Peter Bastian, Sten Wikke, Michael Rasmussen, Edmund Christiansen og Jan Pedersen.

## Pædagogisk uddannelse

Ingeniørhøjskolen Odense Teknikums pædagogiske grundkursus - 2003

Ph.D. skolen, Syddansk Universitet

## Activities

### **Video-analysis of interaction for the purpose of improving the development of robot platforms.**

Rasmussen, G. (Participant), Gutierrez, J. P. D. L. (Organizer), Dittrich, Y. (Chairman), Jensen, J. S. (Participant), Holsgaard-Larsen, A. (Participant), Pedersen, M. B. (Participant), Rocha Silva, T. (Participant) & Sørensen, A. S. (Participant)

15. Nov 2023

### **Partnerskabet Space Exploration Danmark (External organisation)**

Iversen, N. (Member) & Sørensen, A. S. (Member)

Dec 2020 → Dec 2022

### **Trauma recovery**

Sørensen, A. S. (Participant)

4. Mar 2020

### **welfare technologies and the laboratory for robot-assisted training**

Sørensen, A. S. (Guest lecturer)

3. Apr 2019

### **Augmented Gravity: Robotassisteret træning**

Sørensen, A. S. (Guest lecturer)

2. Apr 2019

#### **14th Annual ACM/IEEE International Conference on Human-Robot Interaction, HRI 2019**

Sørensen, A. S. (Participant), Rasmussen, G. (Participant) & Solis, J. (Participant)  
11. Mar 2019

#### **Social intelligence in Kinesthetic, Personalized, Adaptive Human-Robot Interaction**

Solis, J. (Organizer), Sørensen, A. S. (Organizer) & Rasmussen, G. (Organizer)  
27. Aug 2018 → 29. Aug 2018

#### **The resistance training sensor**

Sørensen, A. S. (Lecturer)  
4. Dec 2014

#### **Robotten som genoptræningsmakker**

Sørensen, A. S. (Lecturer)  
20. Nov 2014

#### **Versatile but accurate biofeedback and tele-training, rooted in resistance bands**

Sørensen, A. S. (Lecturer)  
28. Oct 2014

#### **Velfærdsteknologi i dag og i morgen: Perspektiver og scenarier over fremtidens velfærdsteknologier**

Sørensen, A. S. (Lecturer)  
11. May 2010

#### **University of Southern Denmark (External organisation)**

Sørensen, A. S. (Member)  
29. Apr 2010 → 1. May 2010

#### **University Technology Matchmaking Biotechnology and Medico-technology**

Sørensen, A. S. (Participant)  
27. Apr 2010

#### **University of Southern Denmark (External organisation)**

Sørensen, A. S. (Member)  
5. Apr 2010 → 21. Apr 2010

#### **Design of the masters education in welfare technology: The curriculum of the education**

Sørensen, A. S. (Advisor)  
2. Dec 2008 → 30. Jun 2009

#### **Technology forecast - Cognition and robotics: Working report about robot technology research in Denmark**

Sørensen, A. S. (Advisor)  
10. Mar 2005 → 30. May 2005

### **Research outputs**

#### **Oh no! She is Flying! Interaction Analysis of Therapist-Robot Collaboration in Gait Rehabilitation**

Gutierrez, J. P. D. L. R., Silva, T. R., Sørensen, A. S. & Rasmussen, G., Dec 2025, In: International Journal of Human-Computer Studies. 206, 28 p., 103620.

#### **Kinematic and kinetic analysis of sit-to-stand and stair-walking with dynamic robot-assisted body weight unloading**

Skovgaard Jensen, J., Nielsen, J. L., Sørensen, A. S., Aagaard, P., Holsgaard-Larsen, A. & Bojsen-Møller, J., Oct 2025, In: Journal of Biomechanics. 191, 9 p., 112891.

### **A gesture-based behaviour-driven development approach for end-user cobot programming**

Silahlı, A., Rosa, J. P. D. L., Solis, J., Ricardez, G. A. G., Hafi, L. E., Håkansson, J., Sørensen, A. S. & Silva, T. R., Jun 2025, In: *Robotica*. 43, 6, p. 2046-2080

### **The effect of robot-assisted versus standard training on motor function following subacute rehabilitation after ischemic stroke - protocol for a randomised controlled trial nested in a prospective cohort (RoboRehab)**

Skovgaard Jensen, J., Sørensen, A. S., Kruuse, C., Nielsen, H. H., Skov, C. D., Jensen, H. B., Buckwalter, M. S., Bojsen-Møller, J., Lambertsen, K. L. & Holsgaard-Larsen, A., 4. Jul 2024, In: *BMC Neurology*. 24, 12 p., 233.

### **Design Goals for End-User Development of Robot-Assisted Physical Training Activities: A Participatory Design Study**

Gutierrez, J. P. D. L. R., Silva, T. R., Dittrich, Y. & Sørensen, A. S., Jun 2024, In: *Proceedings of the ACM on Human-Computer Interaction*. 8, EICS, 31 p., 258.

### **End-User Programming of Robot-Assisted Physical Training Activities through Behaviour-Driven Development**

Gutierrez, J. P. D. L., Silva, T. R. & Sørensen, A. S., 11. Mar 2024, *HRI 2024 Companion - Companion of the 2024 ACM/IEEE International Conference on Human-Robot Interaction*. Association for Computing Machinery, p. 387-391

### **Acute effects of robot-assisted body weight unloading on biomechanical movement patterns during overground walking**

Skovgaard Jensen, J., Holsgaard-Larsen, A., Stengaard Sørensen, A., Aagaard, P. & Bojsen-Møller, J., 2024, In: *Journal of Biomechanics*. 162, 111862.

### **From Gestures to Behaviours: An Empirical Study on Behaviour-Driven Development Scenarios to Support End-User Programming of Collaborative Robots**

Rosa, J. P. D. L., Solis, J., Nakamori, K., Ricardez, G. A. G., Håkansson, J., Sørensen, A. S. & Silva, T. R., 2024, *Robotics and Mechatronics: Proceedings of ISRM 2024*. Romdhane, L., Mlika, A., Zeghloul, S., Chaker, A. & Laribi, M. A. (eds.). Springer, Vol. 158. p. 369-381 11 p. (Mechanisms and Machine Science).

### **Towards a Low-Code Programming Environment for Robot-Assisted Physical Training Activities**

Rosa, J. P. D. L., Sørensen, A. S. & Rocha Silva, T., 3. Oct 2023, *2023 IEEE Symposium on Visual Languages and Human-Centric Computing (VL/HCC)*. IEEE, p. 287-289 (IEEE Symposium on Visual Languages and Human-Centric Computing Proceedings).

### **PLATYPUS: An Environment for End-User Development of Robot-Assisted Physical Training**

De La Rosa Gutierrez, J. P. & Sørensen, A. S., 13. Mar 2023, *HRI 2023: Companion of the 2023 ACM/IEEE International Conference on Human-Robot Interaction*. Association for Computing Machinery, p. 342-346

### **Data Visualization Dashboards in Robotic Rehabilitation**

Liakopoulou, C., Mansourvar, M., Bøglid, A., Naemi, A. & Stengaard Sørensen, A., 27. May 2021, *Public Health and Informatics*. Mantas, J., Stoicu-Tivadar, L., Chronaki, C., Hasman, A., Weber, P., Gallos, P., Crişan-Vida, M., Zoulias, E. & Chirila, O. S. (eds.). IOS Press, Vol. 281. p. 278-282 (Studies in Health Technology and Informatics).

### **ROS-Enabled Hardware Framework for Experimental Robotics**

Steckhahn-Strohmer, B., Bøglid, A., Sørensen, A. S. & Larsen, L. B., Dec 2019, *Proceedings of International Conference on Reconfigurable Computing and FPGAs*. Andrews, D., Cumplido, R., Feregrino, C. & Platzner, M. (eds.). IEEE, 2 p.

### **Bodily Human Robot Interaction**

Solis, J., Sørensen, A. S. & Rasmussen, G., 22. Mar 2019, *14th ACM/IEEE International Conference on Human-Robot Interaction (HRI)*. IEEE, p. 683-684

### **RoBody Interaction: A New Approach at Kinesthetic Human Robot Interaction**

Sørensen, A. S. & Rasmussen, G., Nov 2018, *Proceedings of the 27th IEEE International Symposium on Robot and Human Interactive Communication: RO-MAN*. IEEE, p. 893-900 (Proceedings - IEEE International Workshop on Robot and Human Communication (ROMAN)).

**Individualised and adaptive upper limb rehabilitation with industrial robot using dynamic movement primitives**  
Nielsen, J., Sørensen, A. S., Christensen, T. S., Savarimuthu, T. R. & Kulvicius, T., 2017. 4 p.

**Natural Kinesthetic Interaction and Social Relations Between Training-Robots and Their Users**  
Sørensen, A. S., Nielsen, J., Maagaard, J., Nielsen, J. L., Rasmussen, G. & Day, D., 2017. 1 p.

**Student to student teaching in a robot electronics course**  
Skriver, M. & Sørensen, A. S., 2017, *Exploring Teaching for Active Learning in Engineering Education: Book of Abstracts*. p. 121 1 p.

**New exercise-integrated technology can monitor the dosage and quality of exercise performed against an elastic resistance band by adolescents with patellofemoral pain: an observational study**  
Rathleff, M. S., Bandholm, T., McGirr, K. A., Haring, S. I., Sørensen, A. S. & Thorborg, K., Jul 2016, In: *Journal of Physiotherapy*. 62, 3, p. 159-163

**Low-cost modular robotic system for neurological rehabilitative training**  
Sørensen, A. S., Nielsen, J., Maagaard, J., Skriver, M., Lin, C.-C. & Schultz, U. P., 19. May 2016, *Proceedings - 2016 IEEE International Conference on Industrial Technology, ICIT 2016*. IEEE Press, p. 1585-1591

**Adherence to commonly prescribed, home-based strength training exercises for the lower extremity can be objectively monitored using the Bandcizer**  
Rathleff, M. S., Thorborg, K., Rode, L. A., McGirr, K., Sørensen, A. S., Bøgild, A. & Bandholm, T., Mar 2015, In: *Journal of Strength and Conditioning Research*. 29, 3, p. 627-636

**Designing of low-cost 1-DOF Robot Device**  
Sørensen, A. S. & Maagaard, J., 2014, Syddansk Universitet. Mærsk Mc-Kinney Møller Institutet. 5 p. (Technical Reports - Maersk Mc-Kinney Moller Institute, University of Southern Denmark, Vol. 2014-1).

**Detection of needle insertion point for phlebotomy in human forearms**  
Savarimuthu, T. R. & Sørensen, A. S., 2014, In: *International Journal of Mechanics and Control*. 15, 1, p. 61-67

**Kinesthetic human/robot coordination: The coordination of movements for interaction**  
Sørensen, A. S., Rasmussen, G. & Day, D., 2014, *HRI 2014 - Proceedings of the 2014 ACM/IEEE International Conference on Human-Robot Interaction*. Association for Computing Machinery, p. 292-293

**Towards Using a Generic Robot as Training Partner: Off-the-shelf robots as a platform for flexible and affordable rehabilitation**  
Sørensen, A. S., Savarimuthu, T. R., Nielsen, J. & Schultz, U. P., 2014, *Proceedings of the 9th ACM/IEEE International Conference on Human-Robot Interaction*. Association for Computing Machinery, p. 294-295

**Towards Automatic Migration of ROS Components from Software to Hardware**  
Lange, A. B., Schultz, U. P. & Sørensen, A. S., 8. Nov 2013, *Proceedings of the Fourth International Workshop on Domain-Specific Languages and Models for Robotic Systems*. 4 p.

**Unity-Link: A Software-Gateway Interface for Rapid Prototyping of Experimental Robot Controllers on FPGAs**  
Lange, A. B., Schultz, U. P. & Sørensen, A. S., 3. Nov 2013, *Proceedings of the IEEE/RSJ International Conference on Intelligent Robots and Systems*. IEEE, p. 3899-3906

**Sensorenhed til kvantificering af fysisk træning med elastik**  
Sørensen, A. S. (Inventor), Nov 2013, IPC No. pa2012 00312, 7. May 2012

**Unity: A Unified Software/Hardware Framework for Rapid Prototyping of Experimental Robot Controllers using FPGAs**  
Lange, A. B., Schultz, U. P. & Sørensen, A. S., 6. May 2013. 4 p.

**A Doppler RADAR sensor for trampoline jumping**

Sørensen, A. S. (Inventor), 2013, Patent No. PA 2013 70134, 8. Mar 2013

**HartOS - A hardware implemented RTOS for hard real-time applications**

Lange, A. B., Andersen, K. H., Schultz, U. P. & Sørensen, A. S., 23. May 2012. 6 p.

**An FPGA based approach to increased flexibility, modularity and integration of low level control in robotics research**

Falsig, S. & Sørensen, A. S., 2011, *International Conference on Intelligent Robots and Systems (IROS), 2010 IEEE/RSJ . IEEE*, p. 6119-6124

**Real-time medical video processing, enabled by hardware accelerated correlations**

Savarimuthu, T. R., Kjaer-Nielsen, A. & Sørensen, A. S., 2011, In: *Journal of Real-Time Image Processing*. 6, 3, p. 187-197 11 p.

**A System on Chip approach to enhanced learning in interdisciplinary robotics**

Sørensen, A. S. & Falsig, S., 22. Oct 2010, *2010 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*. IEEE, p. 4050-4056

**Velfærdsteknologi i rugekassen: Hvad er velfærdsteknologi**

Sørensen, A. S., 7. May 2010, In: *Mandag Morgen*. p. 14-17 4 p.

**An FPGA based Node-on-Chip Architecture, for Rapid Robotics Research**

Falsig, S. & Sørensen, A. S., 2010.

**A step toward 'plug and play' robotics with SoC technology**

Sørensen, A. S., Falsig, S. & Ugilt, R., 2010. 4 p.

**Improving the quality of near-infrared imaging of in vivo blood vessels using image fusion methods**

Jensen, A. K., Savarimuthu, T. R. & Sørensen, A. S., 1. Dec 2009, *Proceedings of the IASTED International Conference on Modelling, Simulation, and Identification, MSI 2009*.

**TosNet: An easy-to-use, real-time communications protocol for modular, distributed robot controllers**

Falsig, S. & Sørensen, A. S., 2009, *Proceedings*. Robocomm, p. 1-6 6 p.

**A Real-Time Embedded System for Stereo Vision Preprocessing Using an FPGA**

Kjær-Nielsen, A., Jensen, L. B. W., Sørensen, A. S. & Krüger, N., 2008, *Reconfigurable Computing and FPGAs, 2008. ReConFig '08. International Conference on* . IEEE, p. 37-42

**DETECTION OF VESSELS IN HUMAN FOREARMS USING 2D MATCHED FILTERING**

Savarimuthu, T. R. & Sørensen, A. S., 2008, *Signal and Image Processing 2008*. Cristea, P. D. (ed.). ACTA Press, p. 294-299 6 p.

**Tactile Sensing Methods for Automated Blood Samples On Humans**

Sørensen, A. S. & Savarimuthu, T. R., 2008, *Advances in mobile robotics: Proceedings of the Eleventh International Conference on Climbing and Walking Robots and the Support Technologies for Mobile Machines*. USA: World Scientific, Vol. 1. p. 875-889 15 p.

**Automated production of one-of-a-kind fiber compositepreforms**

Sørensen, A. S. & Dalgaard, L., 2006, *Proceedings of the 12th IASTED International Conference: Robots And Applications*. ACTA Press, p. 73-78 6 p.

**Implementation of a practical reconfigurable manipulator system based on hybrid parallel and sequential elements**

Sørensen, A. S., Jakobsen, O. G., Favrholt, P., Petersen, H. G., Jacobsen, N. J. & Steinicke, J., 2004, *International Conference on Intelligent Manipulation and Grasping (IMG04)*. p. 404-409

**A development of parallel robotic modules for long reach applications**

Sørensen, A. S., Petersen, H. G., Jacobsen, N. J. & Jakobsen, O. G., 2001

**Experiments in ergonomic robot-guided manipulation**

Sørensen, A., Liu, C., Kim, S. M., Lynch, K. M. & Peshkin, M. A., 2000

**Towards a generic controller for arbitrary robotic manipulators**

Joosen, W., Jørgensen, B. N., Linder, S. M., Olsen, M. M., Perram, J. W., Petersen, H. G., Ruhoff, P. T., Sørensen, A., Sørensen, A. S. & Wagenaar, J. M., 2000, *Proceedings of IASTED International Conference on Robotics and Applications*. p. 34-40