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Fundamental pedagogical view and Teaching Philosophy

I am a strong advocate for active learning as I believe learning is best achieved when applying theory in practice. When applicable I encourage group work and peer discussion among the students as I believe these are strong tools for learning, especially for engineering, but I do not strictly enforce this as I am aware some people learn better through solitary immersion into a subject. I expect my students to drive their own learning and decide for themselves how to best do this, however, I am very willing to provide advice and guidance on the matter.

In my teaching I aim at design case-based project work that the student can use to process the teaching material that I conveyed them towards. When this is not possible, I aim to guide them through open in-class discussions with the hopes of creating a good environment for curiosity and reflection. I hope to enable the students not just use the knowledge they obtain, but also be critical and obtain the competences to adapt it to concrete cases outside the given examples. I also believe in emphasizing clearly to the students why we work on the different subjects, and the background for the pedagogical approach I take, to encourage that the course is about learning and that their focus should not be the lowest effort route to pass the exam.

In my role as supervisor for student projects I try to create a safe space for open and creative discussions. However, even as I attempt to take the more reactive role, I am not hesitant to provide ideas. In this I try to guide the student away from major pitfalls, but ensure that there is room for them to make mistakes and learn from them, and thus adjust my level of "interference" with their work based on urgency and approaching deadlines.

To keep improving my abilities as a teacher I frequently ask for critical views on both the teaching I carry out, as well as the course content and material used. I take feedback from the students very seriously and do my best to reflect on and act on it. This leads to ongoing improvements, both in course content and my pedagogical approaches.

Teaching experience

Bachelor and final projects

Simon Faarvang Mathiesen
01/09/2021 → ...

Introduction to Robots in Automation

Simon Faarvang Mathiesen
01/09/2020 → ...

Semester projects

Simon Faarvang Mathiesen
01/01/2018 → ...

Pedagogical training

Lecturer Training Program at SDU (UP & LTP)

The program is meant for educating university staff on lecturing principles, so they can improve their teaching skills and learn how to continuously improve. The program consists of 5 modules:

- Module 1 "Inspiration" - Introduction to teaching methods. Topics include:

- * Students as Learners
- * Research-based Teaching
- * Evaluation and Data Collection
- * Setting up your course in itslearning.

- Module 2 "Coaching" - Obtaining insight in my teaching through supervision of colleagues and being supervised by senior teacher and professional teaching consultant.
- Module 3 "Development" - Experimenting with and developing my teaching practice.
- Module 4 "Presentation" - Present and share your Development Project results.
- Module 5 "Future Development" - Reflections on teaching, updating teaching portfolio and concluding dialog.

I have taken the following supporting courses:

- Motivational teaching, 15/03-2022
- MCQ - Construction and quality control of multiple choice items, 06/05-2022
- Use student response systems in your teaching (Poll Everywhere), 28/04-2023

Research output

A Flexible and Robust Vision Trap for Automated Part Feeder Design

Haugaard, R. L., Iversen, T. M., Buch, A. G., Kramberger, A. & Mathiesen, S. F., Dec 2022, *2022 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*. IEEE, p. 6017-6023 (IEEE International Conference on Intelligent Robots and Systems).

A Digital Twin-based Workspace Monitoring System for Safe Human-Robot Collaboration

Park, J., Sørensen, L. C., Mathiesen, S. F. & Schlette, C., 2022, *2022 10th International Conference on Control, Mechatronics and Automation, ICCMA 2022*. IEEE, p. 24-30

Applying Robotics Centered Digital Twins in a Smart Factory for Facilitating Integration and Improved Process Monitoring

Mathiesen, S. F., Sørensen, L. C., Sartori, A., Lindvig, A. P., Waspe, R. & Schlette, C., 2022, *Towards Sustainable Customization: Bridging Smart Products and Manufacturing Systems - Proceedings of the 8th Changeable, Agile, Reconfigurable and Virtual Production Conference CARV 2021 and 10th World Mass Customization and Personalization Conference MCPC 2021*. Andersen, A-L., Andersen, R., Brunoe, T. D., Larsen, M. S. S., Nielsen, K., Napoleone, A. & Kjeldgaard, S. (eds.). Springer, p. 305-313 (Lecture Notes in Mechanical Engineering).

Towards Flexible PCB Assembly Using Simulation-Based Optimization

Mathiesen, S. F., Sørensen, L. C., Iversen, T. M., Hagelskjær, F. & Kraft, D., 2022, *Towards Sustainable Customization: Bridging Smart Products and Manufacturing Systems - Proceedings of the 8th Changeable, Agile, Reconfigurable and Virtual Production Conference CARV 2021 and 10th World Mass Customization and Personalization Conference MCPC 2021*. Andersen, A-L., Andersen, R., Brunoe, T. D., Larsen, M. S. S., Nielsen, K., Napoleone, A. & Kjeldgaard, S. (eds.). Springer, p. 166-173 (Lecture Notes in Mechanical Engineering).

Towards Digital Twins for Industrial Assembly - Improving Robot Solutions by Intuitive User Guidance and Robot Programming

Sørensen, L. C., Mathiesen, S., Waspe, R. & Schlette, C., Oct 2020, *Proceedings - 2020 25th IEEE International Conference on Emerging Technologies and Factory Automation, ETFA*. IEEE, p. 1480-1484 (IEEE International Conference on Emerging Technologies and Factory Automation. Proceedings).

Free-Form Trap Design for Vibratory Feeders using a Genetic Algorithm and Dynamic Simulation

Haraldson, D. F., Sørensen, L. C. & Mathiesen, S., 10. Jul 2020, *Proceedings of the 17th International Conference on Informatics in Control, Automation and Robotics: ICINCO*. Gusikhin, O., Madani, K. & Zaytoon, J. (eds.). SCITEPRESS Digital Library, Vol. 1. p. 294-304

Wilson Score Kernel Density Estimation for Bernoulli Trials

Sørensen, L. C., Mathiesen, S., Kraft, D. & Petersen, H. G., 10. Jul 2020, *Proceedings of the 17th International Conference on Informatics in Control, Automation and Robotics*. Gusikhin, O., Madani, K. & Zaytoon, J. (eds.). SCITEPRESS Digital Library, Vol. 1. p. 305-313

Towards robot cell matrices for agile production—SDU Robotics' assembly cell at the WRC 2018

Schlette, C., Buch, A. G., Hagelskjær, F., Iturrate, I., Kraft, D., Kramberger, A., Lindvig, A. P., Mathiesen, S., Petersen, H. G., Rasmussen, M. H., Savarimuthu, T. R., Sloth, C., Sørensen, L. C. & Thulesen, T. N., 17. Apr 2020, In: *Advanced Robotics*. 34, 7-8, p. 422-438

A sorting system for sorting objects

Mathiesen, S. & Kramberger, A., 16. Apr 2020, IPC No. B65G 47/ 52 A I, Patent No. WO2020074719, 11. Oct 2019, Priority date 12. Oct 2018, Priority No. DK2018PA70670

Adapting Learning by Demonstration for Robot Based Part Feeding Applications

Kramberger, A., Iturrate, I., Deniša, M., Mathiesen, S. & Sloth, C., 2020, *Proceedings of the 2020 IEEE/SICE International Symposium on System Integration, SII*. IEEE, p. 954-959

Vision-less Bin-Picking for Small Parts Feeding

Mathiesen, S., Iturrate, I. & Kramberger, A., 2019, *2019 IEEE 15th International Conference on Automation Science and Engineering, CASE 2019*. IEEE, p. 1657-1663 (IEEE International Conference on Automation Science and Engineering).

Optimisation of Trap Design for Vibratory Bowl Feeders

Mathiesen, S., Sørensen, L. C., Kraft, D. & Ellekilde, L-P., 13. Sept 2018, *Proceeding of the 2018 IEEE International Conference on Robotics and Automation*. IEEE, p. 3467-3474

Automatic Design of Vibratory Feeders using Dynamic Simulation

Mathiesen, S., 2017, Syddansk Universitet. Det Tekniske Fakultet.

Automation Selection and Sequencing of Traps for Vibratory Feeders

Mathiesen, S. & Ellekilde, L-P., 2017, *Proceedings of the 7th International Conference on Simulation and Modeling Methodologies*. SCITEPRESS Digital Library, Vol. 1. p. 145-154

Configuration and validation of dynamic simulation for design of vibratory bowl feeders

Mathiesen, S. & Ellekilde, L. P., 2016, *Proceeding of the 12th IEEE International Conference on Control and Automation*. IEEE, p. 485-492

Configuration System for Simulation Based Design of Vibratory Bowl Feeders

Natapon Hansen, M., Mathiesen, S., Ellekilde, L-P. & Madsen, O., 2016, *Proceedings of the 5th International Conference on Simulation, Modeling, and Programming for Autonomous Robots*. IEEE Press, p. 147-154 7862389

Industrial Assembly Cases

Ellekilde, L-P., Buch, J. P., Iversen, T. M., Laursen, J. S., Mathiesen, S., Sørensen, L. C., Kraft, D., Savarimuthu, T. R., Petersen, H. G., Chrysostomou, D., Hansson, M. & Schou, C., 2016, Syddansk Universitet. Mærsk Mc-Kinney Møller Institutet. 22 p. (Technical Reports - Maersk Mc-Kinney Moller Institute, University of Southern Denmark; No. 1).