

Jørgen Christian Larsen
Adjunkt
Mærsk Mc-Kinney Møller Institutet
SDU Embodied Systems for Robotics and Learning
Postadresse:
Campusvej 55
5230
Odense M
Danmark
E-mail: jcla@mmmi.sdu.dk
Fax: 66157697
Mobil: 28459215
Telefon: 65503547



Scientific focus areas

My focus is divided between two research areas - namely "Cyber Physical Systems" and "Embodied Artificial Intelligence". I feel that the combination of these two fields opens up highly interesting questions in developing deeply integrated Cyber Physical Systems into Embodied Artificial systems, leading towards more advanced and adaptive systems.

Research Experience

During my Ph.D. I have worked on the EU project Locomorph, in tight collaboration with our 5 research partners. Through this, I have gained a lot of experience in international collaboration between research groups. I have been developing the LocoKit construction kit as part of the Locomorph project, and thereby contributed significantly to the contributions from University of Southern Denmark. As part hereof, I have also been visiting Lauflabor at Technische Universität Darmstadt for five months during spring 2012.

Employment

2014 – current: Assistant Professor at the Maersk Mc-Kinney Moller Institute, Faculty of Engineering, University of Southern Denmark, Odense, Denmark.

2013 - 2013: Scientific Research Assistant at the Maersk Mc-Kinney Moller Institute, Faculty of Engineering, University of Southern Denmark, Odense, Denmark.

2009 - 2013: Phd student, at the Maersk Mc-Kinney Moller Institute, Faculty of Engineering, University of Southern Denmark, Odense, Denmark.

2007 - 2009: Student assistant in the Adaptronics group, at the Maersk Mc-Kinney Moller Institute, Faculty of Engineering, University of Southern Denmark, Odense, Denmark.

2008 - 2009: Teacher and Concept developer at the "Robot Sommer Camp" in 2008 and 2009, organized by "RoboDays" in Odense, Denmark.

2006 - 2011: Co-ordinator, developer and teacher in the "LEGO-Lab" at the Faculty of Engineering, University of Southern Denmark, Odense, Denmark

2006-2011: Teaching assistant at the Maersk Mc-Kinney Moller Institute, Faculty of Engineering, University of Southern Denmark, Odense, Denmark.

Education

2013: Ph.D. in Robotic Systems at the Maersk Mc-Kinney Moller Institute, Faculty of Engineering, University of Southern Denmark, Odense, Denmark.

2011: M.Sc. in Robot Systems Engineering at the Maersk Mc-Kinney Moller Institute, Faculty of Engineering, University of Southern Denmark, Odense, Denmark.

2008: B.Sc. of Science in Computer Systems Engineering at the Maersk Mc-Kinney Moller Institute, Faculty of Engineering, University of Southern Denmark, Odense, Denmark.

Awards

"Innovation Award 2012 – For practical innovation in the field of robotics", by Emerald

Qualifications

- Experience in embedded system development with FPGA and micro controllers.
- Highly skilled developer of mechatronic systems.
- Solid experience in programming with: C, Java, C#, VB6, Matlab, VHDL.
- Knowledge in programming with: Python, C++
- Experienced user and developer for both Windows and Linux platforms.
- In-depth knowledge in both modern and classical artificial intelligence.
- Highly skilled developer of robotic systems that combine electronics, mechatronics, artificial intelligence and make use of the symbiosis that emerge between these technologies.
- Experienced user of 3D printers and CAD software.
- Experience in international scientific collaboration throughout the 4 year EU project -Locomorph.
- Experienced developer and user of embedded Linux.

Publications

A Combination of Central Pattern Generator-based and Reflex-based Neural Networks for Dynamic, Adaptive, Robust Bipedal Locomotion

Di Canio, G., Larsen, J. C., Wörgötter, F. & Manoonpong, P. 2016 *Proceedings of the First International Symposium on Swarm Behavior and Bio-Inspired Robotics*. SWARM, 4 s.

A Dung Beetle-like Leg and its Adaptive Neural Control

Di Canio, G., Stoyanov, S., Larsen, J. C., Hallam, J., Kovalev, A., Kleinteich, T., Gorb, S. & Manoonpong, P. 2016 *Proceedings of the First International Symposium on Swarm Behavior and Bio-Inspired Robotics*. SWARM, 4 s.

A Robot Leg with Compliant Tarsus and its Neural Control for Efficient and Adaptive Locomotion on Complex Terrains

Di Canio, G., Stoyanov, S., Larsen, J. C., Hallam, J., Kovalev, A., Kleinteich, T., Gorb, S. & Manoonpong, P. 2016 *Artificial Life and Robotics*. 21, 3, s. 274–281

Adaptive Combinatorial Neural Control for Robust Locomotion of a Biped Robot

Di Canio, G., Stoyanov, S., Balmori, I. T., Larsen, J. C. & Manoonpong, P. 2016 *From Animals to Animats 14: 14th International Conference on Simulation of Adaptive Behavior, SAB 2016, Aberystwyth, UK, August 23-26, 2016, Proceedings*. Tuci, E., Giagkos, A., Wilson, M. & Hallam, J. (red.). Springer, s. 317-328 (Lecture Notes in Computer Science, Vol. 9825).

Der skal gang i robotterne - fra Lego til LocoKit

Larsen, J. C. 25 nov. 2014 | *Aktuel Naturvidenskab*. 5, 2014, 5-2014

Fault-tolerant gait learning and morphology optimization of a polymorphic walking robot

Christensen, D. J., Larsen, J. C. & Stoy, K. 2014 | *Evolving Systems*. 5, 1, s. 21-32 12 s.

Locomotion Through Morphosis

Larsen, J. C. 1 jul. 2013 Syddansk Universitet. Det Naturvidenskabelige Fakultet. 169 s.

Increased performance in a bottom-up designed robot by experimentally guided redesign

Larsen, J. C. 2013 | *Industrial Robot*. 40, 3, s. 238-245

On sub-modularization and morphological heterogeneity in modular robotics: Advances in Intelligent Systems and Computing

Lyder, A. H., Stoy, K., Garcíá, R. F. M., Larsen, J. C. & Hermansen, P. 2013 *Intelligent Autonomous Systems 12: Volume 1 Proceedings of the 12th International Conference IAS-12, held June 26-29, 2012, Jeju Island, Korea*. Lee, S., Cho, H., Yoon, K.-J. & Lee, J. (red.). Springer, s. 649-661 13 s.

Extending Mechanical Construction Kits to Incorporate Passive and Compliant Elements for Educational Robotics
Assaf, D., Larsen, J. C. & Reichardt, M. 13 sep. 2012

On Sub-Modularization and Morphological Heterogeneity in Modular Robotics
Lyder, A., Støy, K., Garcia, R. F. M., Larsen, J. C. & Hermansen, P. 30 jun. 2012

Adaptive Strategy for Online Gait Learning Evaluated on the Polymorphic Robotic LocoKit
Johan Christensen, D., Larsen, J. C. & Støy, K. 17 maj 2012

LocoKit: A Robot Construction Kit for Studying and Developing Functional Morphologies
Larsen, J. C., Brandt, D. & Støy, K. 2012

Systematic, bottom-up robot design using a biomechanical experimental methodology
Larsen, J. C., Støy, K., Brandt, D., Grimmer, S. & Gross, M. 2012

Energy Efficiency of Robot Locomotion Increases Proportional to Weight
Larsen, J. C. & Støy, K. 2011

Energy Efficiency of Robot Locomotion Increases Proportional to Weight
Larsen, J. C. & Støy, K. 2011 *Proceedings of the 2nd European Future Technologies Conference and Exhibition 2011*.
Giacobino, E. & Pfeifer, R. (red.). Elsevier Science, Vol. 7, s. 228-230 3 s. (Procedia Computer Science).

LocoKit - A Construction Kit for Exploration of Morphology of Legged Robots
Larsen, J. C. & Støy, K. 2011

Locomotion: Energy Efficiency of Robot Locomotion Increases Proportional to Weight
Larsen, J. C. & Støy, K. 2011

Locomotion through Morphosis
Larsen, J. C. 2011 Faculty of Science and Engineering, University of Southern Denmark. 78 s.

Increased Versatility of Modular Robots through Layered Heterogeneity
Larsen, J. C., Støy, K. & Garcia, R. F. M. 2010

Flexible, fpga-based electronics for modular robots
Brandt, D., Larsen, J. C., Christensen, D. J., Garcia, R. F. M., Shaikh, D., Schultz, U. P. & Støy, K. 2008 *Proceedings of the IROS Workshop on Self-Reconfigurable Robots, Systems and Applications*. 5 s.

Activities

Frontiers in Neurorobotics (Tidsskrift)

Larsen, J. C. (Peer reviewer)

18 maj 2015

Aktivitet: Forskning › Peer reviewer/fagfællebedømmer af manuskripter

Ny teknologi der ændrer vores verden: Avancerede robotter

Larsen, J. C. (Foredragsholder)

29 apr. 2015

Aktivitet: Foredrag og mundtlige bidrag › Foredrag og præsentationer i privat eller offentlig virksomhed

Århundredets Festival: Robotter og deres betydning for menneskets eksistens?

Larsen, J. C. (Foredragsholder)

5 mar. 2015

Aktivitet: Foredrag og mundtlige bidrag › Foredrag og præsentationer i privat eller offentlig virksomhed

Avancerede robotter – Fra LEGO til LocoKit

Larsen, J. C. (Foredragsholder)

17 feb. 2015

Aktivitet: Foredrag og mundtlige bidrag › Foredrag og præsentationer i privat eller offentlig virksomhed

Ny teknologi der ændrer vores verden: Avancerede robotter

Larsen, J. C. (Foredragsholder)

11 feb. 2015

Aktivitet: Foredrag og mundtlige bidrag › Foredrag og præsentationer i privat eller offentlig virksomhed

Darmstädter Heinerfest

Larsen, J. C. (Taler)

6 jul. 2014 → 7 jul. 2014

Aktivitet: Foredrag og mundtlige bidrag › Konferenceoplæg

Adaptive Motion in Animals and Machines

Larsen, J. C. (Deltager)

11 mar. 2013 → 14 mar. 2013

Aktivitet: Deltagelse i faglig begivenhed › Organisering af eller deltagelse i konference

Joined Seminar 3M

Larsen, J. C. (Taler)

25 feb. 2013 → 28 feb. 2013

Aktivitet: Foredrag og mundtlige bidrag › Konferenceoplæg

Locomorph Summer School on Morphology and Morphosis in Animals and Robots 2012

Larsen, J. C. (Arrangør)

23 aug. 2012 → 27 aug. 2012

Aktivitet: Deltagelse i faglig begivenhed › Organisering af eller deltagelse i konference

International Conference on Climbing and Walking Robots

Larsen, J. C. (Deltager)

23 jul. 2012 → 27 jul. 2012

Aktivitet: Deltagelse i faglig begivenhed › Organisering af eller deltagelse i konference

Living Machine 2012: The First International Conference on Biomimetic and Biohybrid Systems

Larsen, J. C. (Deltager)

10 jul. 2012 → 12 jul. 2012

Aktivitet: Deltagelse i faglig begivenhed › Organisering af eller deltagelse i konference

LocoKit: A Robotic Toolkit for Exploring the Importance of Morphology in Legged Locomotion

Larsen, J. C. (Foredragsholder)

14 jun. 2012

Aktivitet: Foredrag og mundtlige bidrag › Foredrag og præsentationer i privat eller offentlig virksomhed

Institut für Sportwissenschaft - Technische Universität Darmstadt

Larsen, J. C. (Gæsteforsker)

1 feb. 2012 → 30 jun. 2012

Aktivitet: Gæsteophold ved andre institutioner

The 5th International Symposium on Adaptive Motion of Animals and Machines

Larsen, J. C. (Taler)

11 okt. 2011 → 14 nov. 2011

Aktivitet: Foredrag og mundtlige bidrag › Konferenceoplæg

Brug af robotter: Optimeringsproblem

Larsen, J. C. (Foredragsholder)

21 sep. 2011

Aktivitet: Foredrag og mundtlige bidrag › Foredrag og præsentationer i privat eller offentlig virksomhed

Summer School on Impedance

Larsen, J. C. (Deltager)

25 jul. 2011 → 29 jul. 2011

Aktivitet: Deltagelse i faglig begivenhed › Organisering af eller deltagelse i workshop, kursus, seminar eller lignende

EMBODY Summer School 2011

Larsen, J. C. (Deltager)

27 jun. 2011 → 1 jul. 2011

Aktivitet: Deltagelse i faglig begivenhed › Organisering af eller deltagelse i workshop, kursus, seminar eller lignende

FETT11 - The European Future Technologies Conference and Exhibition

Larsen, J. C. (Deltager)

2011

Aktivitet: Deltagelse i faglig begivenhed › Organisering af eller deltagelse i konference

IEEE International Conference on Robotics and Automation. ICRA'10

Larsen, J. C. (Taler)

3 maj 2010 → 8 maj 2010

Aktivitet: Foredrag og mundtlige bidrag › Konferenceoplæg

Robotfodbold og Kunstig Intelligens

Larsen, J. C. (Foredragsholder)

21 sep. 2009 → 25 sep. 2009

Aktivitet: Foredrag og mundtlige bidrag › Foredrag og præsentationer i privat eller offentlig virksomhed

IROS Workshop on Self-Reconfigurable Robots & Systems and Applications

Larsen, J. C. (Deltager)

22 sep. 2008 → 26 sep. 2008

Aktivitet: Deltagelse i faglig begivenhed › Organisering af eller deltagelse i konference

Language

- Danish: Fluent reading, writing and speaking

- English: Fluent reading, writing and speaking

- German: Limited

Personally

I am 31 years old and live together with my wife Dorte and our daughter Agnes. In general, I am very minded on continues progress in all areas of my life. I like new challenges and enjoy to get myself involved in new projects, both at work and at home. Though I can handle assignments on my own, I like to work together in groups because I believe that more than two eyes on a subject might reveal new insights into it. Privately I play three different instruments, and I relax while doing do-it-yourself tasks. I try to get the best out of my time.