

Johan Lilius
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Biography

Prof. Johan Lilius is full professor of Embedded Systems at Åbo Akademi since 2001. He is an experienced academic researcher, educator and leader. He was co-PI of the research group "Formal Methods in Programming" that was awarded the status of Centre of Excellency by the Academy of Finland. He has won the Ten-Year Most Influential Paper Award at the ACM/IEEE Conference on Model Driven Engineering Languages and Systems, and a number of Best Paper awards. In 2015 he won the Gadd Prize for Research Excellence at Åbo Akademi. He has experience in leading large academic organisations. He has been director of TUCS, Turku Center for Computer Science, and Head of the Department of IT under several periods. Under his leadership he has planned and implemented the restructuring of the department and its education as part of two major reorganizations of the University. He is a member of the steering group of the Digivisio2030 project, a large national project involving all HEIs in Finland, that is creating a new ecosystem for education in Finland. He is the founder and co-PI of the MAST Institute, a joint research institute of Åbo Akademi and Novia Maritime Academy developing tools and techniques for safe autonomous navigation of vessels. He is experienced in leading PhD reserach, he has been head of the TUCS graduate programme, he has completed the supervision of 11 doctoral students, and is currety supervising 4 students. He has co-organised and co-chaired several workshops, summer schools and conferences. He has published over 170 research papers. His research interests include Energy-efficient Software, Safety of autonomous vessels, and Embedded Deep Neural Computing.

Employment

Professor

Information Technology
Åbo Akademi University
Turku, Finland
1 Jan 2010 → present

Visiting Professor

Institut National des Sciences Appliquées de Rennes
Rennes, France
1 Oct 2016 → 1 Oct 2016

Director

Turku Centre for Computer Science
Turku, Finland
1 Jan 2011 → 1 Dec 2014

Northeast Normal University

Changchun, China
1 Jan 2009 → present

Projects

1. **KSE: Kvarken Space Eco**
Lilius, J., Iancu, B. & Zelioli, L.
01/09/19 → 31/08/22
Project: Research
2. **INTERSYS: Modular Interoperability for Healthcare Cyber-Physical Systems**
Lilius, J. & Liljeberg, P.
01/01/16 → 31/12/17
Project: Research

3. **ParallaX**
Lilius, J., Westerholm, J., Lafond, S. & Björkqvist, J.
01/05/13 → 30/06/16
Project: Research
4. **AMEBA: Agent Based Management of Embedded Data Reserve**
Lilius, J., Lafond, S. & Liljeberg, P.
01/01/12 → 31/12/14
Project: Research
5. **DORADO: Dataflow Oriented Automated Design Toolchain**
Lilius, J. & Lafond, S.
01/09/11 → 31/08/15
Project: Research
6. **EFCO: Efficient Feature Combination**
Lilius, J.
01/01/06 → 01/01/08
Project: Research
7. **ADSEES: Architecture-driven software engineering for embedded systems**
Lilius, J.
01/01/01 → 01/01/03
Project: Research

Publications

A Benchmark for Maritime Object Detection with Centernet on an Improved Dataset, ABOships-PLUS

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Data Sharing in RoPax Ports: Challenges and Opportunities

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Triple Helix Collaborative Innovation and Value Co-creation in an Industry 4.0 Context

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ABOships - An Inshore and Offshore Maritime Vessel Detection Dataset with Precise Annotations

Iancu, B., Soloviev, V., Zelioli, L. & Lilius, J., 5 Feb 2021, In: Remote Sensing. 13, 5, p. 1-17 17 p., 988.

A experimental research platform for maritime automation and autonomous surface ship applications

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Challenges of Artificial Intelligence and Machine Learning Software in Autonomous Vessels

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Comparing CNN-Based Object Detectors on Two Novel Maritime Datasets

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Recursive Task Generation for Scalable SDF Graph Execution on Multicore Processors

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A survey of machine learning approaches for surface maritime navigation

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On the Verification and Validation of AI Navigation Algorithms

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Scenario-based Testing of a Ship Collision Avoidance System

Porres, I., Azimi, S. & Lilius, J., 2020, *2020 46th Euromicro Conference on Software Engineering and Advanced Applications (SEAA)*. IEEE, p. 545-552

An efficient model for quantifying the interaction between structural properties of software and hardware in the ARM big.LITTLE architecture

Stepanovic, S., Georgakarakos, G., Holmbacka, S. & Lilius, J., 2019, In: *Concurrency and Computation: Practice and Experience*. p. –

RDF stores for enhanced living environments: An overview

Karvinen, P., Diaz-Rodriguez, N., Grönroos, S. & Lilius, J., 2019, *Enhanced Living Environments: Algorithms, Architectures, Platforms, and Systems*. Ganchev, I., Garcia, N. M., Dobre, C., Mavromoustakis, C. X. & Goleva, R. (eds.). Springer, p. 19–52

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Inactivity Benchmarking

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Stepanovic, S., Georgakarakos, G., Holmbacka, S. & Lilius, J., 2018, *2018 26th Euromicro International Conference on Parallel, Distributed and Network-based Processing (PDP)*. Merelli, I., Lio, P. & Kottenko, I. (eds.). IEEE, p. 138–144

A Method for Automatic Whoosh Sound Description

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Detecting data-parallel synchronous dataflow graphs

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Energy-Awareness and Performance Management with Parallel Dataflow Applications

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Task-based execution of synchronous dataflow graphs for scalable multicore computing

Georgakarakos, G., Kanur Chandra Shekar, S., Lilius, J. & Desnos, K., 2017, *Signal Processing Systems (SiPS), 2017 IEEE International Workshop on*. IEEE, p. –

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A Knowledge Engineering Approach to Computational Creativity in Sound Design

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Analysis on scalability and energy efficiency of HEVC decoding using task-based programming model

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An Ontology for Wearables Data Interoperability and Ambient Assisted Living Application Development.

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Accurate Energy Modelling for Many-Core Static Schedules

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Cost-Efficient, Utility-Based Caching of Expensive Computations in the Cloud

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Determining a Device Crossover Point in CPU/GPU Systems for Streaming Applications

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Execution of dataflow process networks on OpenCL platforms

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Performance Monitor Based Power Management for big.LITTLE Platforms

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A Fuzzy Ontology for Semantic Modelling and Recognition of Human Behaviour

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A Run-Time Power Manager Exploiting Software Parallelism

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A Survey on Ontologies for Human Behaviour Recognition

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A task migration mechanism for distributed many-core operating systems

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Can IT health-care applications improve the medication tray-filling process at hospital wards? An exploratory study using eye-tracking and stress response

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Cost-Efficient, Utility-Based Caching of Expensive Computations in the Cloud

Byholm, B., Jokhio, F., Ashraf, A., Lafond, S., Lilius, J. & Porres Paltor, I., 2014, Turku Centre for Computer Science (TUCS).

Decoding of DVB-T2 LDPC Codes on a Tile Processor: Optimisations and Performance Comparisons

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Energy and Power Management, Measurement and Analysis for Multi-Core Processors

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Energy Efficiency and Performance Management of Parallel Dataflow Applications

Holmbacka, S., Nogues, E., Pelcat, M., Lafond, S. & Lilius, J., 2014, *The 2014 Conference on Design & Architectures for Signal & Image Processing*. Ana, P. & Adam, M. (eds.). ECDI Electronic Chips & Systems design initiative, p. 1–8

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Exploiting Smart Spaces for Interactive TV Applications Development

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Handling Real-World Context-Awareness, Uncertainty and Vagueness in Real-Time Human Activity Tracking and Recognition with a Fuzzy Ontology-Based Hybrid Method

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Power-Aware HEVC Decoding with Tunable Image Quality

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Smart Dosing: A Mobile Application for Tracking the Medication Tray-Filling and Dispensation Processes in Hospital Wards

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An Approach to Improve Semantics in Smart Spaces Using Reactive Fuzzy Rules

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A Scalable Distributed M3 Platform on a Low-Power Cluster

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Extending Semantic Web Tools for Improving Smart Spaces Interoperability and Usability

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Introduction to Cloud Computing Technologies

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Parallel Decoder for Low Density Parity Check Codes: A MPSoC Study

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Rapid Prototyping of Semantic Applications in Smart Spaces with a Visual Rule Language

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