Cláudio Gomes

▬▬▬ Key Academic Skills at a Glance

Researcher
- ○ Participated in 5 journal and 24 conference publications (peer reviewed).
- ○ Google H-Index is 18, ResearchGate score is 645.5, and most cited paper has 387 citations. 1368 new citations since 2019.
- ○ Awarded a Research Foundation Flanders (FWO) Scholarship.

Collaborator
- ○ 30 international collaborations (applied mathematics, formal methods), universities (Aarhus, Carnegie Mellon, KU Leuven, UCLouvain, McGill, KTH, Manchester), and companies (Boeing, Novo Nordisk, Vestas, Lego, Technicon, Flanders Make, Virtual Vehicle Research Center, fortiss, and Bosch).

Leader
- ○ Official co-supervisor of 6 PhD Students in the domains of modelling and simulation, manufacturing, anomaly detection, and machine learning.

Teacher
- ○ Assisting practical lectures since 2nd year of BSc (12 semesters).
- ○ Assistant Professor since 2022.

Learner
- ○ Contributed to surveys in new fields (e.g., [21, 24, 65]).
- ○ Applied knowledge from other fields to problems on own field (e.g., [60]).
- ○ Co-authored contributions outside own field (e.g., [57, 51]).

Speaker
- ○ Delivered +30 presentations to international audiences, 7 of which were invited, at universities such as TU Graz, UCLouvain, research institutes such as IFP Energie Nouvelles, and companies such as Siemens, Boeing Research&Technology Europe, and Novo Nordisk.

Community Assistant
- ○ Took part in the program committee of 3 conferences (Springsim, RIVF, ANNSIM), chair of the CPS Track in the ANNSIM conference 2021 and 2022 editions, and co-organizer of 2 editions of CoSimCPS workshop.
- ○ Part of FMI Standard Steering committee.
- ○ Reviewed 15 papers in the past 3 years for journals such as SIMULATION, Sensors and Actuators, SoSym, and SIMPAT.
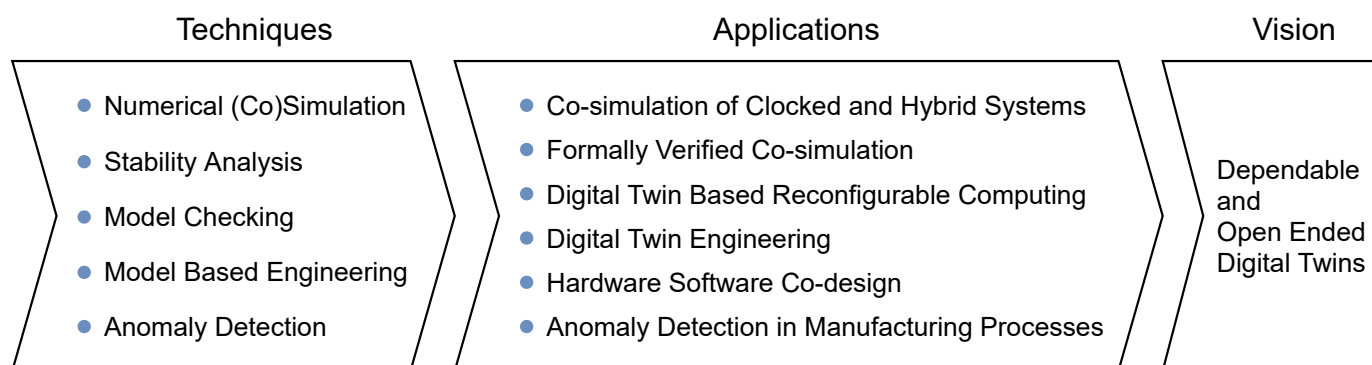
Employment

01/2022 – Present   **Assistant Professor**, *Aarhus University*, Aarhus, Middle Jutland, Denmark
Supervision, teaching, and conducting research with a focus on co-simulation, digital twin engineering, and machine learning for digital twins.

01/2020 – 01/2022   **Postdoctoral Researcher**, *Aarhus University*, Aarhus, Middle Jutland, Denmark
Supervision and research with a focus on co-simulation, digital twin engineering, and machine learning for digital twins.

11/2019 – 12/2019   **Visiting Researcher**, *Carnegie Mellon University*, Greater Pittsburgh Area
Collaborated with Prof. Andre Platzer and Stefan Mitsch on runtime monitoring of co-simulations.

03/2015 – 09/2019   **FWO Fellow Phd Student**, *University of Antwerp*, Antwerp Area, Belgium
Pursued a Ph.D. in Computer Science with a focus on co-simulation.

07/2013 – 01/2015   **Software Engineer**, *Altitude Software*, Lisbon
Worked as a Front and Backend engineer on a real-time web application for telephony scripts and customer relations, specified by a Domain Specific Language.

09/2011 – 01/2013   **Assistant Lecturer**, *NOVA School of Science and Technology*, Almada
Taught practical (lab) classes involving C and Octave programming languages.

10/2009 – 07/2012   **Researcher in the SOLAR group**, *NOVA School of Science and Technology*, Almada
Participated in research focused on the methodology for prototype transformations and transformational semantics in a control system specification language.

Education

01/03/2015– 31/12/2019   **PhD**, *University of Antwerp*, Property Preservation in Co-simulation, Antwerp, Belgium
Supervisor: Prof. Hans Vangheluwe.

01/09/2011– 22/11/2013   **MSc and BSc degree, Mark: *18 (out of 20, honors)***, *New University of Lisbon*, A Framework for Efficient Model Transformations, Lisbon, Portugal
Supervisor: Prof. Vasco Amaral.

Scientific Focus Areas

Techniques	Applications	Vision
• Numerical (Co)Simulation • Stability Analysis • Model Checking • Model Based Engineering • Anomaly Detection	• Co-simulation of Clocked and Hybrid Systems • Formally Verified Co-simulation • Digital Twin Based Reconfigurable Computing • Digital Twin Engineering • Hardware Software Co-design • Anomaly Detection in Manufacturing Processes	Dependable and Open Ended Digital Twins

Project, Grants & Awards (Selected)

01/2024   **ROBOSAPIENS: Robotic Self Adaptation in Novel Environments**, *Horizon Europe CL4 RIA Project (Budget: 4M€, 7 Partners, AU part 1.2M€)*, Aarhus, Denmark
Role: co-coordinator, digital twin safety expert.

23/05/2023   **Runner Up Best Paper Award at ANNSIM Conference**, Ontario, Canada

11/2021   **DIGIT-BENCH: DIGItal Twin for large-scale test BENCHes for the wind industry (AU part 2.6 MDKK)**, *EUDP*, Aarhus, Denmark
Role: PI on AU-ECE side, supervision of postdoc and phd students, and DT engineering expert.

11/2021   **Demonstration of Lifetime Extension (DLTE) Concept (AU part 1.5 MDKK)**, *EUDP*, Aarhus, Denmark
Role: PI on AU-ECE side, supervision of postdoc and phd students, and co-simulation expert.

10/2020   **UPSIM Unleash Potentials in SIMulation ITEA 3 Project (Budget 19.7M€, 6MDKK AU)**, Aarhus, Denmark
Role: state of the art in co-simulation and simulation governance work packages.

09/2020   **MADE FAST (Budget: 300MDKK, 15.6MDKK AU, 7 companies with AU)**, Aarhus, Denmark
Role: Co-supervision in Part Projects 3.01, 3.06, 4.07, 4.08, 4.09, 4.10.

06/2020   **Digit Brain Innovation Action (Budget: 8M€, 3.3MDKK AU), 36 Partners**, Aarhus, Denmark
Role: Revising AU experiments.

10/10/2019   **FWO Travel Grant to Carnegie Mellon University**, Pittsburgh, United States

31/07/2019   **Best Paper Award at SIMULTECH conference**, Prague, Czech Republic

07/10/2016   **2nd Place ACM Student Research Competition**, Saint-malo, France

01/01/2016   **FWO PhD Fellowship**, *Scholarship for 4 years, full time researcher*, Antwerp

22/11/2013   **Merit Student**, *2nd highest grade of CS MSc*, Lisbon, Portugal

Stays

11/11/2019   **Computer Science Department, Carnegie Mellon University, Pittsburgh, United States**, *Co-simulation Monitoring*, 5 weeks, Host: Prof. André Platzer

06/06/2018   **TU Graz, Austria**, *Co-simulation Collaboration*, 1 week, Host: Georg Engel (Senior Researcher)

01/03/2018   **Engineering Department, Aarhus University, Denmark**, *Verification of Co-simulation Methods*, 1 week, Host: Prof. Peter Gorm Larsen

05/10/2017   **Department of Computer Science, Manchester University, UK**, *Delayed Events in Co-simulation*, 1 week, Host: Prof. Eva Navarro-López

14/09/2017   **Applied Mathematics Department, Université Catholique de Louvain, Belgium**, *Stable Adaptive Co-simulation with Switched Systems*, 1 week, Host: Prof. Raphaël Jungers

05/09/2016   **Fortiss GmbH, Germany**, *Model Transformation Engine Optimization*, 1 week, Host: Levi Lúcio (Senior Researcher)

11/03/2016   **Engineering Department, Aarhus University, Denmark**, *Co-simulation Survey Preparation*, 1 week, Host: Prof. Peter Gorm Larsen

International Collaborations / R&D Projects

1/2020–Now   **Synopsys, ESI ITI GmbH, Robert Bosch GmbH, Dassault Systemes, dSPACE GmbH, AVL List GmbH, TLK-Thermo GmbH, Altair**, *FMI Standardization Committee*, Aarhus, Denmark
Designing version 3.0 of the FMU standard. Joint Publications: [47, 44].

10/2020–Now   **Novo Nordisk**, *Anomaly Detection for Manufacturing Processes*, Aarhus, Denmark
Application of state of the art anomaly detection methods to the production of dose pens.

10/2020–Now   **Vestas**, *Enabling Mobile Manufacturing*, Aarhus, Denmark
Mobile manufacturing survey.

10/2020–Now   **Lego**, *Anomaly Detection for Machining Processes*, Aarhus, Denmark
Joint Publications: [43].

10/2020–Now   **Technicon**, *Automated Configuration of Robot Manufacturing Cells*, Aarhus, Denmark
Joint Publications: [49, 37, 36].

08/2019– 10/2019	**Boeing Research and Technology Europe**, *Hint-Based Configuration of Co-simulations*, Madrid, Spain Joint Publications: [55, 48].	
09/2016	**Fortiss GmbH**, *Model Transformation Engine Optimization*, Munich, Germany Joint Publications: [64].	

Ongoing Academic Collaborations

Researcher	Context	Department	Institution
Peter Gorm Larsen	Co-supervision and Research	Electrical and Computer Engineering	Aarhus University
Alexandros Iosifidis	Co-supervision and Research		
Carl Schultz	Research		
Lukas Esterle	Co-supervision and Research		
Henrik Ejersbo	Research		
Casper Thule	Research		
Mirgita Frasheri	Research		
Kenneth Lausdahl	Research		
Michael Sandberg	Research		
Emil Madsen	Research		
Jaco van de Pol	Research	Computer Science	
Giuseppe Abbiati	Research	Civil and Architectural Engineering	
Mahdi Abkar	Proposal Writing	Mechanical and Production Engineering	
Fenjuan Hu	Proposal Writing	Bioscience - Terrestrial Ecology	
Jim Woodcock	Research	Computer Science	University of York
John Fitzgerald	Proposal Writing and Research	School of Computing	Newcastle University
Ken Pierce	Proposal Writing and Research		
Sergiy Bogomolov	Proposal Writing and Research		
Houxiang Zhang	Proposal Writing	Faculty of Engineering	Norwegian University of Science and Technology
Peter Palensky	Proposal Writing	Electrical Engineering, Mathematics and Computer Science	Delft University of Technology
Erika Ábrahám	Proposal Writing	Computer Science	RWTH Aachen University
Gerald Schweiger	Research	Software Technology	Graz University of Technology
Ján Drgoňa	Research	Physics and Computational Sciences	Pacific Northwest National Laboratory
Christian Schlette	Co-supervision and Research	Faculty of Engineering	University of Southern Denmark
Wim Desmet	Research	Mechanical Engineering	KU Leuven
Hans Vangheluwe	Research	Computer Science	University of Antwerp
Paul De Meulenaere	Proposal Writing	Electronics - ICT	

*Department of Electrical trand Computer Engineering, Aarhus University – 8200 Aarhus N
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05/2022– Now **LakeTwin: Adaptive Lake Ecosystem Management through Digital Twin**, *DFF Research Project 1 (Thematic)*, Aarhus, Denmark
Role: PI;
Status: `Writing` .

01/2024– Now **ROBOSAPIENS: Robotic Self Adaptation in Novel Environments**, *Horizon Europe CL4 RIA Project (Budget: ≈4M€, ≈7 Partners, AU part 8.1 MDKK)*, Aarhus, Denmark
Role: coordinating, preparing state of the art and work packages for AU;
Status: `Accepted` .

11/2021 **DIGIT-BENCH: DIGItal Twin for large-scale test BENCHes for the wind industry (AU part 2.6 MDKK)**, *EUDP*, Aarhus, Denmark
Role: Co-PI, preparing state of the art and work packages for AU;
Status: `Accepted` .

11/2021 **Demonstration of Lifetime Extension (DLTE) Concept (AU part 1.5 MDKK)**, *EUDP*, Aarhus, Denmark
Role: Co-PI;
Status: `Accepted` .

11/2021 **DILIGENT: Digital Twin Engineering for a Resilient Future**, *MSCA Doctoral Network (Budget: ≈4M€, ≈8 Partners)*, Aarhus, Denmark
Role: coordinating, preparing state of the art and work packages for AU;
Status: `Rejected` .

05/2021 **DiTToLA: Digital Twin for Tool Life Assessment**, *DFF*, Aarhus, Denmark
Role: preparing state of the art and work packages for digital twin;
Status: `Submitted` .

05/2021 **AI-rPET: Data-assisted tools for thermoforming of recycled PET in food packaging**, *DFF*, Aarhus, Denmark
Role: preparing state of the art and work packages for digital twin;
Status: `Rejected` .

09/2020 – 06/2024 **MADE FAST (Budget: 300MDKK, 15.6MDKK AU, 7 companies with AU)**, Aarhus, Denmark
Role: Edition Part Projects 3.01, 3.06, 4.07, 4.08, 4.09, 4.10;
Status: `Accepted` .

09/2020 **Wear Mitigation in Hydraulic Systems using Digital Twin**, *DFF*, Aarhus, Denmark
Role: preparing state of the art and work packages for digital twin;
Status: `Rejected` .

10/2020 – 09/2023 **UPSIM Unleash Potentials in SIMulation ITEA 3 Project (Budget 19.7M€, 6MDKK AU)**, Aarhus, Denmark
Role: preparing state of the art in co-simulation and simulation governance work packages;
Status: `Accepted` .

06/2020 – 12/2023 **Digit Brain Innovation Action (Budget: 8M€, 3.3MDKK AU), 36 Partners**, Aarhus, Denmark
Role: Revising AU experiments;
Status: `Accepted` .

10/2019 **DiT-MaP: Digital Twins for Manufacturing Processes Villum Foundation**, Aarhus, Denmark
Role: preparing state of the art in digital twins;
Status: `Rejected` .

03/2019 **PULSE: Perpetual Learning for cyber-physical Systems of Systems H2020**, Aarhus, Denmark
Role: revising state of the art in co-simulation;
Status: `Rejected` .

Teaching

Spring 2023 / Fall 2024 / Spring 2024	**Data Structures and Algorithms**, *Assistant professor*, Aarhus, Denmark Tasks: Preparing and delivering lectures on data structures and algorithms Program: BsC and BEng.
Spring 2022	**Software Design**, *Assistant professor*, Aarhus, Denmark Tasks: Preparing and delivering lectures on software architecture and design patterns Program: BsC.
Spring 2022 / Spring 2021 / Spring 2020	**Systems Engineering**, *Teaching assistant with Associate Prof. Stefan Hallerstede on model based systems engineering with co-simulation*, Aarhus, Denmark Tasks: Delivering practical lecture, tutorial on using the INTO-CPS application, and preparing questionnaires. Program: MSc in Computer Engineering.
Fall 2019 / Fall 2018 / Fall 2017 / Fall 2016 / Fall 2015	**Modelling of Software-Intensive Systems**, *Teaching assistant with Prof. Hans Vangheluwe on causal block diagrams*, Antwerp, Belgium Tasks: Preparing course exercises and exam questions on Petri Nets and Simulink Block Diagrams, and correction of exams and assignments. Program: MSc in Computer Science.
Fall 2018 / Fall 2017	**Model Driven Engineering**, *Teaching assistant with Prof. Hans Vangheluwe on Domain Specific Languages and Model Transformations*, Antwerp, Belgium Tasks: Responsible for the practical part of the course: determining lab assignments and projects, delivering practical lectures, formulating and correcting part of the exam. Program: MSc in Computer Science.
Fall 2013 / Fall 2012	**Domain Specific Languages**, *Teaching assistant on Domain Specific Languages with Prof. Vasco Amaral*, Lisbon, Portugal Tasks: Helping with lab assignments and projects, delivering practical lectures, correcting part of the exam and assignments. Program: MSc in Computer Science.
Spring 2012 / Spring 2011	**Formal languages and automata theory**, *Teaching assistant on Automata, Grammars, and Regular Expressions with Prof. Vasco Amaral*, Lisbon, Portugal Tasks: Helping with lab assignments and projects, delivering practical lectures, correcting part of the exam and assignments. Program: BSc in Computer Science Engineering.
Fall 2010	**Introduction to Programming in C**, *Teaching assistant preparing and correcting exercises for students from physics and mathematics BSc with Prof. Artur Miguel Dias*, Lisbon, Portugal Tasks: Helping with lab assignments and projects, delivering practical lectures and recapping theory, and correcting part of the exam and assignments. Program: BSc in Computer Science Engineering.

Research Leadership

Program Committees	**Springsim, RIVF, and ANNSIM conferences.**
Conference Organization	**CPS Track in the ANNSIM conference 2021 and 2022 editions, and co-organizer of 3 editions of CoSimCPS workshop.**
Editor	**Guest editor for the SIMULATION journal, special issue on Digital Twins.**
Reviews	**Reviewer for 8 different journals in the past 2 years.**

Supervision

Post Docs	**2 Ongoing**

PhD Students	**4 Completed, 2 Ongoing**
MSc Students	**8 Completed, 1 Ongoing**
BSc Students	**4 Completed**

Dissemination

09/2022	**DICO Workshop, Aarhus, Denmark**, *Co-simulation and It's Role in Digital Twin*
06/2022	**ECCOMAS Conference, Oslo, Norway**, *Co-simulation and It's Role in Digital Twin Engineering*
05/2022	**Driving IT Aarhus 2022, Aarhus, Denmark**, *Introduction to Digital Twin Engineering*, Host: IDA IT
06/2021	**Novo Nordisk, Denmark**, *Introduction to the Functional Mockup Interface Standard*, Host: Thomas Algot Søllested, Project Manager
10/2019	**Siemens, Belgium**, *Tutorial on co-simulation*, Host: Dr. Stefan Dutre, Senior Product Manager
08/2019	**Boeing Research and Technology Europe, Madrid**, *Hint-based Configuration of Co-simulations*, Host: Dr. Alejandro Torres Gámiz, Systems Modeling and Simulation Engineer
20/06/2018	**Austrian Institute for Sustainable Technologies, Graz, Austria**, *Introduction to Co-simulation*, Host: Dr. Georg Engel, Senior Researcher
19/06/2018	**TU Graz, Austria**, *Introduction to Co-simulation*, Host: Dr. Gerald Schweiger, Head of Intelligent Systems Lab
5/09/2017	**CoSim-CPS Workshop, Trento, Italy**, *Keynote: Co-simulation, State of the Art*, Host: Prof. Cinzia Bernardeschi, Dr. Paolo Masci, and Prof. Peter Gorm Larsen, Co-organizers of the workshop.
13/04/2018	**Carnegie Mellon University, Pittsburgh, USA**, *Co-simulation: State of the Art*, Host: Prof. David Garlan, Associate Dean for Master's Programs in the School of Computer Science
1/03/2017	**IFP Energies Nouvelles, Paris, France**, *Input Approximations in Co-simulation*, Host: Dr. Laurent Duval, Researcher and Data science project manager
17/08/2016	**Université Catholique de Louvain, Louvain-la-Neuve, Belgium**, *Stable Optimization of Co-simulation: a Switched Systems Approach*, Host: Prof. Raphaël Jungers, Department of Applied Mathematics
22/03/2016	**MPM4CPS Training, Tallinn, Estonia**, *Model-based Multi-disciplinary Co-simulation*, Host: Hans Vangheluwe, head of the MSDL research group

Community Building

Scientific Event Organization

07/12/2021	**Co-Chair**, *5th Workshop on Formal Co-Simulation of Cyber-Physical Systems*, Virtual
22/07/2021	**Co-Chair**, *Annual Modeling and Simulation Conference*, Virtual
14/09/2020	**Co-Chair**, *4th Workshop on Formal Co-Simulation of Cyber-Physical Systems*, Virtual
22/07/2020	**Chair**, *CPS Track of Summersim Conference*, Virtual
16/09/2019	**Co-Chair**, *3rd Workshop on Formal Co-Simulation of Cyber-Physical Systems*, Oslo, Norway

Program Committee Activities

2021	**CPS Track – Annual Modeling and Simulation Conference**
2016/2018 /2019/2020	**TMS/DEVS Track – Spring simulation conference Multi-Conference**
2020	**CPS Track – Summer Simulation Conference**
2021	**ACM Conference on Principles of Advanced Discrete Simulation**
2019	**JuliaCon**
2019	**Workshop on Modeling and Simulation of Software-Intensive Systems**
2018	**Workshop on Distributed Estimation and Control in Networked Systems**
2018/2019 /2020	**Workshop on Formal Co-Simulation of Cyber-Physical Systems**
2016	**Winter Simulation Conference**
2016	**IEEE RIVF International Conference on Computing and Communication Technologies: Research, Innovation, and Vision for the Future**

Journal Reviewing Activities

2021	**Simulation: Transactions of the Society for Modeling and Simulation**
2021	**Sensors and Actuators A: Physical**
2018/2019 /2020/2021	**International Journal on Software and Systems Modeling**
2019/2021	**Parallel Computing**
2018/2020	**Machine Theory and Practice journal**
2018/2019	**Simulation Modelling Practice and Theory journal**
2018	**Oil & Gas Science and Technology journal**
2017	**Engineering with Computers journal**

Professional Experience

| 22/11/2013– 01/02/2015 | **Software developer**, *Altitude Software*, Lisbon
Front and Backend engineer of a real-time web application for telephony scripts and customer relations, specified by a Domain Specific Language. |

Languages

Portuguese	Native
English	Professional working proficiency
Danish	Intermediate

Publications

Peer Reviewed Journals

[1] Prasad Talasila, **Cláudio Gomes**, Lars B Vosteen, Hannes Iven, Martin Leucker, Santiago Gil, Peter H Mikkelsen, Eduard Kamburjan, and Peter G Larsen. Composable digital twins on Digital Twin as a Service platform. *SIMULATION*, page 00375497241298653, December 2024.

[2] Santiago Gil, Bentley J Oakes, **Cláudio Gomes**, Mirgita Frasheri, and Peter G Larsen. Toward a sys-

tematic reporting framework for Digital Twins: A cooperative robotics case study. *SIMULATION*, page 00375497241261406, August 2024.

[3] F. Nordtorp, E. E. Baş, **Cláudio Gomes**, and G. Abbiati. A Hybrid Testing Framework for Wind Turbine Mechanical Components. *Journal of Physics: Conference Series*, 2767(5):052046, June 2024.

[4] Simon Thrane Hansen, Casper Thule, **Cláudio Gomes**, Kenneth Guldbrandt Lausdahl, Frederik Palludan Madsen, Giuseppe Abbiati, and Peter Gorm Larsen. Co-simulation at different levels of expertise with Maestro2. *Journal of Systems and Software*, 209:111905, March 2024.

[5] Santiago Gil, Peter H. Mikkelsen, **Cláudio Gomes**, and Peter G. Larsen. Survey on open-source digital twin frameworks–A case study approach. *Software: Practice and Experience*, page spe.3305, January 2024.

[6] Peter G. Larsen, Shaukat Ali, Roland Behrens, Ana Cavalcanti, **Cláudio Gomes**, Guoyuan Li, Paul De Meulenaere, Mikkel L. Olsen, Nikolaos Passalis, Thomas Peyrucain, Jesús Tapia, Anastasios Tefas, and Houxiang Zhang. Robotic safe adaptation in unprecedented situations: The RoboSAPIENS project. *Research Directions: Cyber-Physical Systems*, 2:e4, 2024.

[7] Valdemar Tang, **Cláudio Gomes**, and Daniel E. Lucani. Precision on Demand: Propositional Logic for Event-Trigger Threshold Regulation. *IEEE Internet of Things Journal*, pages 1–1, 2024.

[8] Till Böttjer, Daniella Tola, Fatemeh Kakavandi, Christian R. Wewer, Devarajan Ramanujan, **Cláudio Gomes**, Peter G. Larsen, and Alexandros Iosifidis. A review of unit level digital twin applications in the manufacturing industry. *CIRP Journal of Manufacturing Science and Technology*, 45:162–189, October 2023.

[9] Giuseppe Abbiati, Ecem E. Baş, **Cláudio Gomes**, and Peter Gorm Larsen. Hybrid fire testing using FMI-based co-simulation. *Fire Safety Journal*, 139:103832, August 2023.

[10] Zahra Kazemi, Jonas Kjaer Rask, **Cláudio Gomes**, Emre Yildiz, and Peter Gorm Larsen. Movable factory—A systematic literature review of concepts, requirements, applications, and gaps. *Journal of Manufacturing Systems*, 69:189–207, August 2023.

[11] Qamar Alfalouji, Thomas Schranz, Basak Falay, Sandra Wilfling, Johannes Exenberger, Thorsten Mattausch, **Cláudio Gomes**, and Gerald Schweiger. Co-simulation for buildings and smart energy systems — A taxonomic review. *Simulation Modelling Practice and Theory*, 126:102770, July 2023.

[12] Sergiy Bogomolov, **Cláudio Gomes**, Carlos Isasa, Sadegh Soudjani, Paulius Stankaitis, and Thomas Wright. Reachability Analysis of FMI Models Using Data-Driven Dynamic Sensitivity. *SIMULATION*, page 00375497241261409, 2023.

[13] Mirgita Frasheri, Henrik Ejersbo, Casper Thule, **Cláudio Gomes**, Jakob Levisen Kvistgaard, Peter Gorm Larsen, and Lukas Esterle. Addressing Time Discrepancy between Digital and Physical Twins. *Robotics and Autonomous Systems*, 161(March 2023, 104347):104347, 2023.

[14] Fatemeh Kakavandi, **Cláudio Gomes**, Roger De Reus, Jeppe Badstue, Jakob Langdal Jensen, Peter Gorm Larsen, and Alexandros Iosifidis. Towards Developing a Digital Twin for a Manufacturing Pilot Line: An Industrial Case Study. In *Digital Twin Driven Intelligent Systems and Emerging Metaverse*, pages 39–64. Springer Nature Singapore, Singapore, 2023.

[15] Farshid Naseri, Santiago Gil, Corneliu Barbu, Erdal Cetkin, Gulsah Yarimca, Anders Jensen, Peter Gorm Larsen, and **Cláudio Gomes**. Digital Twin of Electric Vehicle Battery Systems: Comprehensive Review of the Use Cases, Requirements, and Platforms. *Renewable and Sustainable Energy Reviews*, 179:113280, 2023.

[16] Randy Paredis, **Cláudio Gomes**, and Hans Vangheluwe. A Family of Digital T Workflows and Architectures: Exploring Two Cases. *Innovative Intelligent Industrial Production and Logistics*, 1855:93–109, 2023.

[17] Simon Thrane Hansen, Casper Thule, **Cláudio Gomes**, Jaco van de Pol, Maurizio Palmieri, Emin Oguz Inci, Frederik Madsen, Jesús Alfonso, José Ángel Castellanos, and José Manuel Rodriguez. Verification and synthesis of co-simulation algorithms subject to algebraic loops and adaptive steps. *International Journal on Software Tools for Technology Transfer*, 24(6):999–1024, December 2022.

[18] Simon Thrane Hansen, **Cláudio Gomes**, Masoud Najafi, Torsten Sommer, Matthias Blesken, Irina Zacharias, Oliver Kotte, Pierre R. Mai, Klaus Schuch, Karl Wernersson, Christian Bertsch, Torsten Blochwitz, and Andreas Junghanns. The FMI 3.0 Standard Interface for Clocked and Scheduled Simulations. *Electronics*, 11(21):3635, November 2022.

[19] Christian Møldrup Legaard, Thomas Schranz, Gerald Schweiger, Ján Drgoňa, Basak Falay, **Cláudio Gomes**, Alexandros Iosifidis, Mahdi Abkar, and Peter Gorm Larsen. Constructing Neural Network-Based Models for Simulating Dynamical Systems. *ACM Computing Surveys*, page 3567591, 2021.

[20] Bentley James Oakes, **Cláudio Gomes**, Franz Rudolf Holzinger, Martin Benedikt, Joachim Denil, and Hans Vangheluwe. Hint-Based Configuration of Co-simulations with Algebraic Loops. *Simulation and Modeling Methodologies, Technologies and Applications*, 1260:1–28, 2021.

[21] Gerald Schweiger, **Cláudio Gomes**, Georg Engel, Irene Hafner, Josef-Peter Schoeggl, Alfred Posch, and Thierry Nouidui. An empirical survey on co-simulation: Promising standards, challenges and research needs. *Simulation Modelling Practice and Theory*, 95:148–163, 2019.

[22] Casper Thule, Kenneth Lausdahl, **Cláudio Gomes**, Gerd Meisl, and Peter Gorm Larsen. Maestro: The INTO-CPS Co-simulation Framework. *Simulation Modelling Practice and Theory*, 92(April):45–61, 2019.

[23] **Cláudio Gomes**, Bart Meyers, Joachim Denil, Casper Thule, Kenneth Lausdahl, Hans Vangheluwe, and Paul De Meulenaere. Semantic Adaptation for FMI Co-simulation with Hierarchical Simulators. *SIMULATION*, 95(3):1–29, 2018.

[24] **Cláudio Gomes**, Casper Thule, David Broman, Peter Gorm Larsen, and Hans Vangheluwe. Co-simulation: A Survey. *ACM Computing Surveys*, 51(3):49:1–49:33, 2018.

Peer Reviewed Workshops

[25] Hao Feng, **Cláudio Gomes**, Michael Sandberg, Hugo Daniel Macedo, and Peter Gorm Larsen. Under What Conditions Does a Digital Shadow Track a Periodic Linear Physical System? In *Software Engineering and Formal Methods. SEFM 2021 Collocated Workshops*, volume 13230, pages 143–155, Cham, 2022. Springer International Publishing.

[26] Lukas Esterle, **Cláudio Gomes**, Mirgita Frasheri, Henrik Ejersbo, Sven Tomforde, and Peter G. Larsen. Digital twins for collaboration and self-integration. In *2021 IEEE International Conference on Autonomic Computing and Self-Organizing Systems Companion (ACSOS-C)*, pages 172–177, DC, USA, September 2021. IEEE.

[27] Hao Feng, **Cláudio Gomes**, Casper Thule, Kenneth Lausdahl, Michael Sandberg, and Peter Gorm Larsen. The Incubator Case Study for Digital Twin Engineering. Technical report, Aarhus University, Department of Engineering, February 2021.

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