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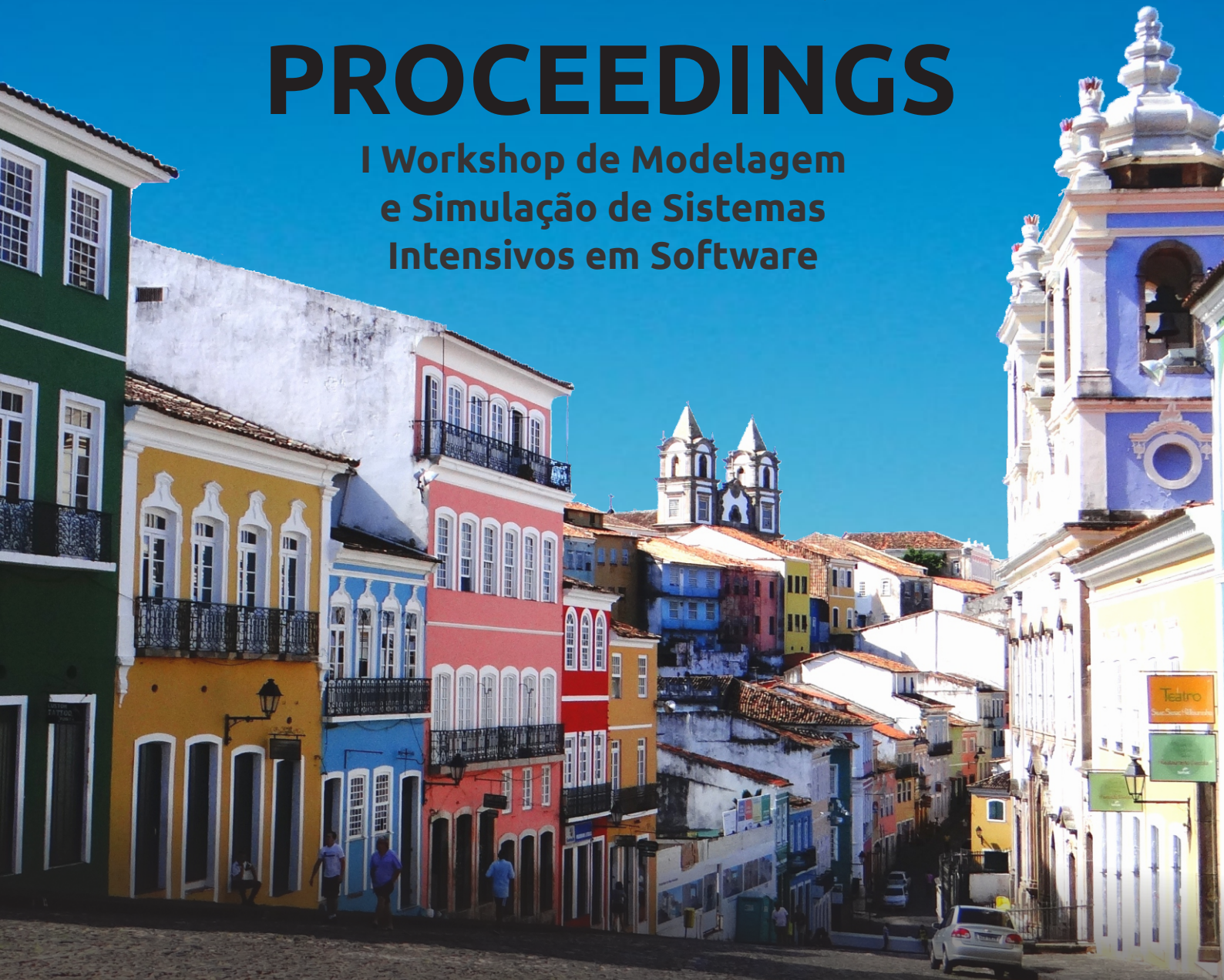
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23rd - 27th SEPTEMBER, 2019

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I Workshop de Modelagem e Simulação de Sistemas Intensivos em Software



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I Workshop de Modelagem e Simulação de Sistemas Intensivos em Software

23 a 27 de setembro, 2019

Salvador, BA, Brazil

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Foreword

Software-intensive systems are those in which software is a dominant and essential element, both in their structure and as a crosscutting element in the production stages, substantially impacting the planning, development, and evolution of these systems. With the emergence and rise of new and ever larger, complex types of systems, such as smart cities, cyber-physical systems, system-of-systems, and software ecosystems, new research frontiers are open to enable reliable modeling of these systems. They are often highly dynamic and interact widely with the surrounding environment. In this sense, it is imperative not only to advance the static modeling of software-intensive systems, but also to advance the modeling of dynamic aspects of these systems. To do so, the use of dynamic software models, such as runtime models and simulation models, becomes paramount.

This is the scenario of the First Workshop on Modeling and Simulation of Software Intensive Systems (MSSiS 2019), whose purpose is to outline the Brazilian community that works with simulation in the context of Software Engineering, providing an environment for discussion of possible synergies among the existing modeling and simulation (M&S) paradigms in Systems Engineering and Software Engineering. Besides that, this workshop addresses the Model Driven Software Engineering research, in particular, with respect to `models@runtime`.

This volume contains the papers accepted and presented at the MSSiS 2019, held on September 25, 2019 in Salvador, Brazil, in conjunction with the X Brazilian Software Congress (CBSOFT). 14 full papers were submitted for appreciation of the Program Committee (PC). Each submission was reviewed by at least three PC members. The committee decided to accept 10 papers (8 full papers and 2 short papers), corresponding to a rate of 57.1% for full papers. In addition, a guest article entitled “CatchML - A Language for Modeling and Verification of Context-Aware Exception Handling Behavior” by Rafael de Lima, Lincoln Rocha, Rossana Andrade, and Valeria Lelli was also included in the program. MSSiS 2019 also has two keynote speakers: Prof. Breno Bernard Nicolau de França (UNICAMP), who lectures “The Role of Simulation-based Studies in Software Engineering Research”, and Prof. Bernard Zeigler, co-organizer of MSSiS and our international keynote speaker with the lecture entitled “MBSE with/without Simulation: State of the Art and Way Forward”.

We thank the IEEE Section Bahia (in the people of the professors Betânia Filha, Fabrício Braga and Thiago Barbosa) and the IEEE Section Centro-Oeste Norte (in the people of the professors Alba Cristina Melo and José Oniram Limaverde Filho) for making possible, the participation of Prof. Bernard Zeigler at MSSiS during his stay in Brazil to visit both IEEE sections.

Last but not least, we thank the Adufg - Sindicato dos Docentes das Universidades Federais de Goiás (ADUFG) for the sponsorship that was crucial for the realization of this event. We would like to extend our sincere thanks for all Organization Committee of CBSOft 2019, who had been solicitous and willing about the demands of MSSiS 2019. We also thank the editors of the Journal of the Brazilian Computer Society (JBCS), Mike Hinchey (Lero/Irlanda) and Lúcia Drummond (UFF), by the waivers granted to invite submissions of extended versions of the three best papers awarded in MSSiS 2019.

We wish you all an excellent MSSiS 2019 with rich discussions on modeling and simulation of software-intensive systems. May this community grow and grow stronger every day in Brazil. See you in Salvador !!!

Valdemar Vicente Graciano Neto
Elisa Yumi Nakagawa
Bernard Zeigler
Workshop Organizers and Steering Committee - MSSiS 2019

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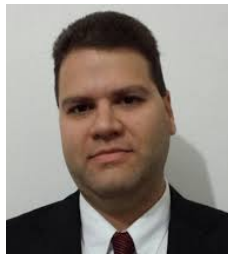
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Prof. Dr. Breno Bernard Nicolau de França



UNICAMP, Brazil

Breno is a professor at the Computing Institute (UNICAMP) and coordinator of the LASER research lab (Laboratory for Software Engineering and Reliability), conducting research on Empirical Software Engineering, Lean and Agile Software Development, Software Architecture, and Computer Simulation. He got his Ph.D. in Systems Engineering and Computer Science at COPPE/UFRJ, where Breno also concluded a Postdoctoral fellowship. He got his master and the bachelor degrees in Computer Science at Universidade Federal do Pará (UFPA). Over the years, Breno had several collaborations with public and private organizations in the context of Research & Development for technology acquisition, evaluation, and transfer supported by experimental methods, software process improvement, and Software Engineering education and training.

Prof. Dr. Bernard Zeigler



University of Arizona, USA

Bernard P. Zeigler is Professor Emeritus of Electrical and Computer Engineering at the University of Arizona. He received a Ph.D. in Computer/Communication Sciences from the University of Michigan (1968), an M.S. in Electrical Engineering from the Massachusetts Institute of Technology (1964), and a B.S. in Engineering Physics from McGill University in Montreal, Canada (1962). Zeigler has held faculty appointments at the University of Michigan (1969–1975, 1980–1981), the Weizmann Institute in Israel (1975–1980), Wayne State University (1981–1984), The University of Arizona (1985–2010), and Arizona State University (2005–2008). While in Arizona, Dr. Zeigler served as the Co-Director of the Arizona Center for Integrative Modeling and Simulation (ACIMS). He is currently affiliated with the Center of Excellence in Command, Control, Communications, Computing and Intelligence (C4I Center) at George Mason University and is also the Chief Scientist at RTSync Corp. Currently, he is also an IEEE Distinguished Speaker.

Zeigler is a Fellow of the Institute of Electrical and Electronics Engineers (IEEE) and The Society for Modeling and Simulation International (SCS) for which he served as President (2002–2004). He is a member of the SCS Hall of Fame. In 2013 he received the Institute for Operations Research and Management Sciences (INFORMS) Simulation Society Distinguished Service Award. In 2015 he received the INFORMS Lifetime Professional Achievement Award, which is the highest honor given by the Institute for Operations Research and the Management Sciences' Simulation Society.

Zeigler has published several books on modeling and simulation and is best known for his theoretical work concerning modeling and simulation based on systems theory and the Discrete Event Systems Specification formalism which he invented in 1976. Recently, he published with two young researchers the third edition of his classic Theory of Modeling and Simulation which has become a classic in the field. Zeigler has played a critical role within the modeling and simulation field through his editorial responsibilities and professional activities that focus on the importance of modeling and simulation in its interaction with other disciplines (e.g., artificial intelligence, biological systems, and defense systems architecture). Zeigler has received much recognition for his various scholarly publications, achievements, and professional service. His 1984 book, Multifaceted Modelling and Discrete Event Simulation, was published by Academic Press and received the outstanding Publication Award in 1988 from The Institute of Management Sciences (TIMS) College on Simulation.

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The Role of Simulation-based Studies in Software Engineering Research

Prof. Dr. Breno Bernard Nicolau de França

UNICAMP, Brazil

Keynote

Abstract

Several decades ago, inspired by other knowledge areas, simulation was introduced as a research method to Software Engineering. Motivated by potential benefits achieved in other areas, the software engineering community has used simulation-based studies for planning, controlling, and improving software development. However, unclear expectations from simulation-based studies, a lack of methodological support, as well as dispersed knowledge to support model building and calibration, simulation-based has hindered its widespread adoption. In this talk, we delineate the role of simulation in software engineering research and compile existing processes and guidelines into a comprehensive life cycle.

Model Based Systems Engineering with/out Simulation: State of the Art and Way Forward

Prof. Dr. Bernard Zeigler

University of Arizona, USA

Keynote

Abstract

The limitations of model-based support for engineering complex systems include limited capability to develop multifaceted models, as well as their analysis with robust reliable simulation engines. Lack of such Modeling and Simulation (M&S) infrastructure leads to knowledge gaps in engineering such complex systems and these gaps appear as epistemological emergent behaviors. In response, an initiative is underway to bring Model- Based Systems Engineering (MBSE) closer together with model-based simulation developments. M&S represents a core capability and is needed to address today's complex, adaptive, systems of systems engineering challenges. This talk will consider the problems raised by MBSE taken as a modeling activity without the support of full strength integrated simulation capability and the potential for, and possible forms of, closer integration between the two streams. An example of a system engineering application, an unmanned vehicle fleet providing emergency ambulance service, will be examined as an application of the kind of multifaceted M&S methodology required to effectively deal with such systems.