

**2019 IEEE/ACM 14th
International Symposium on
Software Engineering for
Adaptive and Self-Managing
Systems (SEAMS 2019)**

**Montreal, Quebec, Canada
25 – 26 May 2019**



**IEEE Catalog Number: CFP1980C-POD
ISBN: 978-1-7281-3369-0**

**Copyright © 2019 by the Institute of Electrical and Electronics Engineers, Inc.
All Rights Reserved**

Copyright and Reprint Permissions: Abstracting is permitted with credit to the source. Libraries are permitted to photocopy beyond the limit of U.S. copyright law for private use of patrons those articles in this volume that carry a code at the bottom of the first page, provided the per-copy fee indicated in the code is paid through Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923.

For other copying, reprint or republication permission, write to IEEE Copyrights Manager, IEEE Service Center, 445 Hoes Lane, Piscataway, NJ 08854. All rights reserved.

****** This is a print representation of what appears in the IEEE Digital Library. Some format issues inherent in the e-media version may also appear in this print version.***

IEEE Catalog Number:	CFP1980C-POD
ISBN (Print-On-Demand):	978-1-7281-3369-0
ISBN (Online):	978-1-7281-3368-3
ISSN:	2157-2305

Additional Copies of This Publication Are Available From:

Curran Associates, Inc
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: (845) 758-0400
Fax: (845) 758-2633
E-mail: curran@proceedings.com
Web: www.proceedings.com

CURRAN ASSOCIATES INC.
proceedings
.com

2019 IEEE/ACM 14th International Symposium on Software Engineering for Adaptive and Self-Managing Systems (SEAMS) **SEAMS 2019**

Table of Contents

Message from ICSE 2019 General Chair	ix
Message from the Chairs of SEAMS 2019	xi
Organizing Committee	xiii
Program Committee	xv
Artifact Program Committee	xx
Doctoral Projects Program Committee	xxi

SEAMS 2019 - Learning

Efficient Analysis of Large Adaptation Spaces in Self-Adaptive Systems using Machine Learning	.1
<i>Federico Quin (KU Leuven, Belgium), Thomas Bamelis (KU Leuven, Belgium), Singh Buttar Sarpreet (Linnaeus University, Sweden), and Sam Michiels (KU Leuven, Belgium)</i>	
On Learning in Collective Self-Adaptive Systems: State of Practice and a 3D Framework	.13
<i>Mirko D' Angelo (Linnaeus University), Simos Gerasimou (University of York), Sona Ghahremani (Hasso Plattner Institute, Universitat Potsdam), Johannes Grohmann (University of Wurzburg), Ingrid Nunes (Instituto de Informatica, Universidade Federal do Rio Grande do Sul (UFRGS)), Evangelos Pournaras (ETH Zurich), and Sven Tomforde (Universitat Kassel)</i>	
Using Unstructured Data to Improve the Continuous Planning of Critical Processes Involving Humans	.25
<i>Colin Paterson (University of York), Radu Calinescu (University of York), Suresh Manandhar (University of York), and Di Wang (University of York)</i>	
TRAPPED in Traffic? A Self-Adaptive Framework for Decentralized Traffic Optimization	.32
<i>Ilias Gerostathopoulos (Technical University of Munich, Germany) and Evangelos Pournaras (ETH Zurich, Switzerland)</i>	

SEAMS 2019 - Autonomy

Machine Learning Meets Quantitative Planning: Enabling Self-Adaptation in Autonomous Robots .39.....	39
<i>Pooyan Jamshidi (University of South Carolina), Javier Cámara (University of York), Bradley Schmerl (Carnegie Mellon University), Christian Kästner (Carnegie Mellon University), and David Garlan (Carnegie Mellon University)</i>	
Self-Adaptation in Mobile Apps: a Systematic Literature Study .51.....	51
<i>Eoin Martino Grua (Vrije Universiteit Amsterdam, The Netherlands), Ivano Malavolta (Vrije Universiteit Amsterdam, The Netherlands), and Patricia Lago (Vrije Universiteit Amsterdam, The Netherlands)</i>	
Applying Evolution and Novelty Search to Enhance the Resilience of Autonomous Systems .63.....	63
<i>Michael Austin Langford (Michigan State University, USA), Glen A. Simon (Michigan State University, USA), Philip K. McKinley (Michigan State University, USA), and Betty H. C. Cheng (Michigan State University, USA)</i>	
Modelling and Analysing Resilient Cyber-Physical Systems .70.....	70
<i>Amel Bennaceur (The Open University), Carlo Ghezzi (Politecnico di Milano), Kenji Tei (National Institute of Informatics), Timo Kehrer (Humboldt-University of Berlin), Danny Weyns (Katholieke Universiteit Leuven), Radu Calinescu (University of York), Schahram Dustdar (Vienna University of Technology), Zhenjiang Hu (National Institute of Informatics), Shinichi Honiden (National Institute of Informatics), Fuyuki Ishikawa (National Institute of Informatics), Zhi Jin (Peking University), Jeffrey Kramer (Imperial College London), Marin Litoiu (York University), Michele Loreti (University of Camerino), Gabriel Moreno (Software Engineering Institute, CMU), Hausi Müller (University of Victoria), Laura Nenzi (University of Trieste), Bashar Nuseibeh (The Open University (United Kingdom) & Lero (Ireland)), Liliana Pasquale (University College Dublin Lero), Wolfgang Reisig (Humboldt University Berlin), Heinz Schmidt (RMIT Australia), Christos Tsigkanos (Vienna University of Technology), and Haiyan Zhao (Peking University)</i>	

SEAMS 2019 - Requirements

Won't Take No for an Answer: Resource-Driven Requirements Adaptation .77.....	77
<i>Amel Bennaceur (The Open University), Andrea Zisman (The Open University), Ciaran McCormick (The Open University), Danny Barthaud (The Open University), and Bashar Nuseibeh (The Open University and Lero - The Irish Software Research Centre)</i>	
Taming Uncertainty in the Assurance Process of Self-Adaptive Systems: a Goal-Oriented Approach .89.....	89
<i>Gabriela Félix Solano (University of Brasilia, Brazil), Ricardo Diniz Caldas (University of Brasilia, Brazil), Genáina Nunes Rodrigues (University of Brasilia, Brazil), Thomas Vogel (Humboldt-Universität zu Berlin, Germany), and Patrizio Pelliccione (Chalmers University of Technology and University of Gothenburg, Sweden)</i>	

Inferring Analyzable Models from Trajectories of Spatially-Distributed Internet of Things .100.....	<i>Christos Tsigkanos (TU Wien - Institut für Information Systems Engineering), Laura Nenzi (University of Trieste), Michele Loreti (University of Camerino), Martin Garriga (Universidad Nacional del Comahue), Schahram Dustdar (TU Wien), and Carlo Ghezzi (Politecnico di Milano)</i>
Dragonfly: a Tool for Simulating Self-Adaptive Drone Behaviours .107.....	<i>Paulo Henrique Maia (State University of Ceará, Brazil), Lucas Vieira (State University of Ceará, Brazil), Matheus Chagas (State University of Ceará, Brazil), Yijun Yu (The Open University, United Kingdom), Andrea Zisman (The Open University, United Kingdom), and Bashar Nuseibeh (The Open University, United Kingdom and The Irish Software Research Centre (LERO), Ireland)</i>

SEAMS 2019 - Security

Towards Secure Architecture-Based Adaptations .114.....	<i>Narges Khakpour (Linnaeus University, Växjö, Sweden), Charilaos Skandylas (Linnaeus University, Växjö, Sweden), Goran Saman Nariman (University of Human Development, Sulaimani, Iraq), and Danny Weyns (KU Leuven, Leuven, Belgium and Linnaeus University, Växjö, Sweden)</i>
Defeating Denial-of-Service Attacks in a Self-Managing N-Variant System .126.....	<i>Jessica Jones (Arizona State University, USA), Jason D. Hiser (University of Virginia, USA), Jack W. Davidson (University of Virginia, USA), and Stephanie Forrest (Arizona State University, USA)</i>
Blockchain Networks as Adaptive Systems .139.....	<i>Sotirios Liaskos (York University), Bo Wang (York University), and Nahid Alimohammadi (York University)</i>
Towards the Detection of Partial Feature Interactions .146.....	<i>Byron DeVries (Grand Valley State University, USA) and Betty Cheng (Michigan State University, USA)</i>

SEAMS 2019 - AI & Adaptivity

Is Adaptivity a Core Property of Intelligent Systems? It Depends .153.....	<i>AbdElRahman ElSaid (Rochester Institute of Technology), Travis Desell (Rochester Institute of Technology), and Daniel Krutz (Rochester Institute of Technology)</i>
Self-Adaptive Artificial Intelligence .155.....	<i>Rogério de Lemos (University of Kent) and Marek Grze (University of Kent)</i>

SEAMS 2019 - Assurance

All Versus One: An Empirical Comparison on Retrained and Incremental Machine Learning for Modeling Performance of Adaptable Software .157.....	<i>Tao Chen (Nottingham Trent University)</i>
--	---

On the Practical Feasibility of Software Monitoring: a Framework for Low-Impact Execution Tracing .169.....	
<i>Jhonny Mertz (Universidade Federal do Rio Grande do Sul (UFRGS)) and</i>	
<i>Ingrid Nunes (Universidade Federal do Rio Grande do Sul (UFRGS))</i>	
DARTSim: An Exemplar for Evaluation and Comparison of Self-Adaptation Approaches for Smart	
Cyber-Physical Systems .181.....	
<i>Gabriel Moreno (Carnegie Mellon University, USA), Cody Kinner</i>	
<i>(Carnegie Mellon University, USA), Ashutosh Pandey (Carnegie Mellon</i>	
<i>University, USA), and David Garlan (Carnegie Mellon University, USA)</i>	
OCCI-Compliant, Fully Causal-Connected Architecture Runtime Models Supporting Sensor Management .188	
<i>Johannes Erbel (University of Goettingen, Institute of Computer</i>	
<i>Science, Germany), Thomas Brand (University of Potsdam, Hasso Plattner</i>	
<i>Institute, Germany), Holger Giese (University of Potsdam, Hasso</i>	
<i>Plattner Institute, Germany), and Jens Grabowski (University of</i>	
<i>Goettingen, Institute of Computer Science, Germany)</i>	
DingNet: A Self-Adaptive Internet-of-Things Exemplar .195.....	
<i>Michiel Provoost (KU Leuven, Belgium) and Danny Weyns (KU Leuven,</i>	
<i>Belgium)</i>	
Author Index 203	