# Fourth SEMAT Workshop on General Theory of Software Engineering

**GTSE 2015**

## Table of Contents

- Message from the Chairs .......................................................... vii
- Committees ................................................................................ viii
- Sponsors and Supporters .......................................................... x

### Keynote

**General Theories of Software Engineering (GTSE): Key Criteria and an Example**

GTSE 2015 Keynote Address Summary ........................................ 1

*Barry Boehm - University of Southern California, USA*

### Development and Cognition

**Towards a Design-Theoretic Characterisation of Software Development Process Models** ............... 3

*Jon G. Hall, Lucia Rapanotti — The Open University, UK*

**Exploring Theory of Cognition for General Theory of Software Engineering** ................................ 15

*Pontus Johnson, Mathias Ekstedt — KTH Royal Institute of Technology, Sweden*

### Values and Complexity

**An Approximate Theory for Value Sensitivity** ........................................ 25

*Balbir Barn, Ravinder Barn — Middlesex University, UK; Royal Halloway University of London*

**A Theory of Software Complexity** .................................................. 29

*Arbi Ghazarian — Arizona State University, USA*

**Essence-Based, Goal-Driven Adaptive Software Engineering** ..................................................... 33

*June Sung Park — KAIST, Republic of Korea*

### Commentaries and Specific Theory

**A Theory about the Structure of GTSEs** ........................................ 39

*Dewayne E. Perry, Don Batory — University of Texas at Austin, USA*
The Unending Quest for Valid, Useful Software Engineering Theories

Mark Staples — NICTA, Australia

Towards an Emerging Theory for the Diagnosis of Faulty Functions in Function-Call Traces

Syed Shariyar Murtaza, Abdelwahab Hamou-Lhadj, Nazim H. Madhvji, Mechelle Gittens
— Concordia University, Canada; University of Western Ontario, Canada

Author Index