

**MESOCA**

Maintenance and Evolution of  
Service-Oriented and Cloud-Based Systems

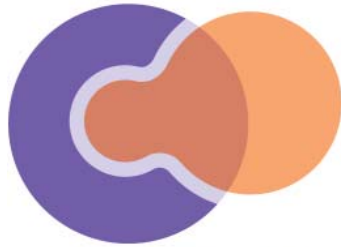
**2013 IEEE 7th International  
Symposium on the Maintenance and  
Evolution of Service-Oriented and  
Cloud-Based Systems (MESOCA 2013)**



**29TH IEEE INTERNATIONAL CONFERENCE  
ON SOFTWARE MAINTENANCE (ICSM 2013)**

**EINDHOVEN, THE NETHERLANDS  
SEPTEMBER 23, 2013**

**GENERAL CHAIR: ANCA DANIELA IONITA  
PROGRAM CO-CHAIRS: GRACE A. LEWIS AND MARIN LITOIU**



**MESOCA**

Maintenance and Evolution of  
Service-Oriented and Cloud-Based Systems

# Welcome



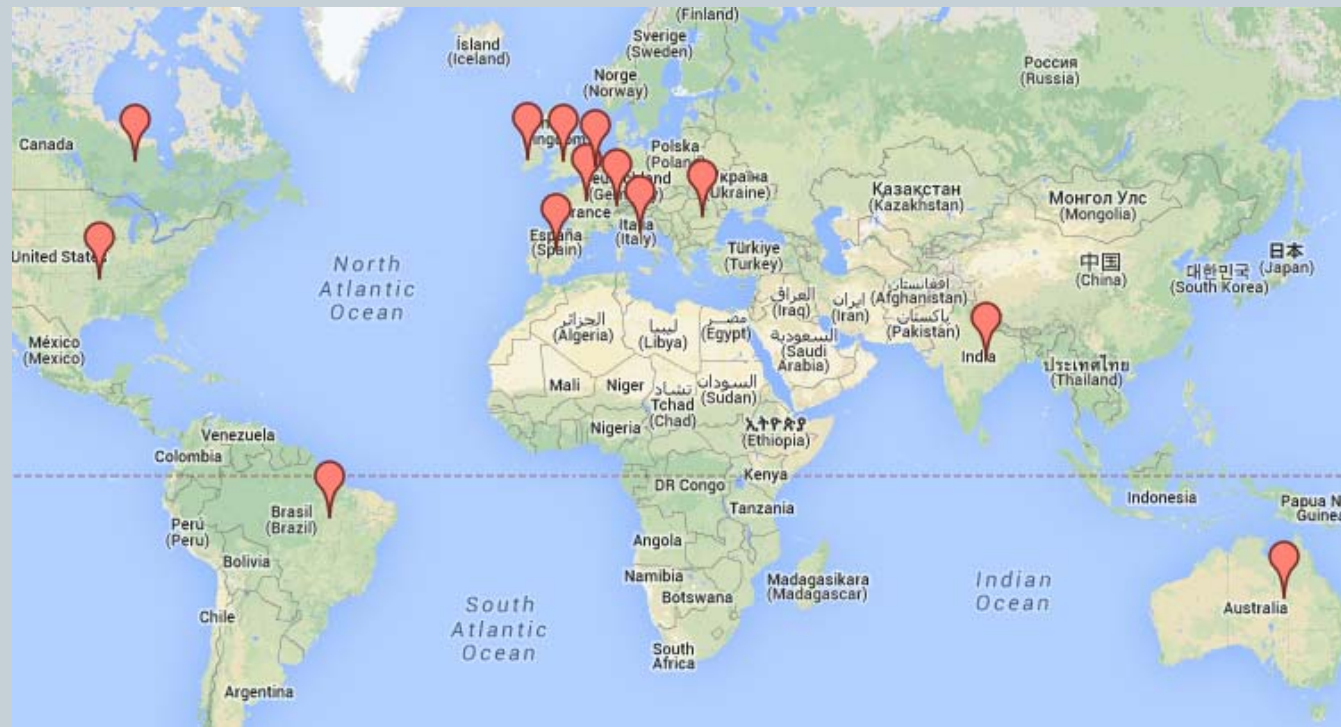
**ANCA DANIELA IONITA**  
**UNIVERSITY POLITEHNICA OF BUCHAREST,**  
**ROMANIA**

## Goal for MESOCA 2013



- **Create a focal point and an ongoing forum for researchers and practitioners to share results and open issues in the area of maintenance and evolution of service-oriented systems and cloud-based environments.**
- **Identify promising areas of research to address existing gaps and problems**

# Eleven Papers, One Keynote, Two Invited Speakers and Three Organizers - from Thirteen Countries



- Australia
- Brazil
- Canada
- France
- India
- Ireland
- Italy
- Romania
- Spain
- Switzerland
- The Netherlands
- United Kingdom
- USA

Created using Google Maps (<http://maps.google.com>)

# Abstract Tag Cloud



applications (18) approach (9) architecture (8)  
automation (4) based (5) business (7) case (7) changes (6) cloud (32)  
company (4) computing (7) data (11) demonstrate (4) describe (6) efficient (4)  
evolution (6) execution (4) existing (5) focus (4) form (4) help (4) infrastructure (5)  
knowledge (4) legacy (6) level (5) manage (6) migration (16)  
monitoring (6) optimization (4) paper (11) platform (6) possible (4) present (8)  
process (12) proposed (8) reduced (5) regression (6) require (6)  
services (31) soa (6) software (12) solutions (9)  
studies (7) systems (16) techniques (5) technologies (6)  
testing (13) used (6) web (17) wsdl (8)

## Observations

Cloud computing focused more attention than other approaches, but services in general also represent an important tag.

The applicative nature of the submission remains equally important as last year.

The testing stage is treated intensely.

The research reports on migration have a higher frequency than for MESOCA 2012.

# Agenda – Morning



08:30 – 08:45	<b>Welcome and Introduction</b> <i>Anca Daniela Ionita, University POLITEHNICA of Bucharest, Romania</i>
09:45 – 09:45	<b>Keynote: Search-based Optimization Techniques in the Context of SOA and Cloud Computing</b> <i>Massimiliano Di Penta (University of Sannio, Italy)</i>
09:45 – 10:00	<b>Coffee Break</b>
10:00 – 11:15	<b>Session 1: Migration to SOA Environments</b> <i>Chair: Mike Smit, Dalhousie University, Canada</i> A Structured Legacy to SOA Migration Process and its Evaluation in Practice <i>Ravi Khadka, Amir Saeidi, Slinger Jansen and Jurriaan Hage (Utrecht University, The Netherlands)</i> Platform-Based Approach for Automation of Workflows in a System of Systems <i>Tarmo Ploom (Credit Suisse AG, Switzerland), Axel Glaser (PostFinance AG, Switzerland) and Stefan Scheit (Telstra Corporation, Australia)</i> Overhauling Legacy Enterprise Software Applications with a Concept Refinement Process Model <i>Daniel Knight, Gregory Knight and Nasseh Tabrizi (East Carolina University, Greenville, USA) Paper Presentations</i>
11:15 – 11:30	<b>Coffee Break</b>
11:30 – 12:30	<b>Session 2: Web Services</b> <i>Chair: Anca Daniela Ionita, University POLITEHNICA of Bucharest, Romania</i> Reusing Existing Object-Oriented Code as Web Services in a SOA <i>Harry M. Sneed (ANECON GmbH, Austria), Chris Verhoef (Free University, The Netherlands) and Stephan H. Sneed (MetaSonic AG, Germany)</i> Comparative Evaluation of the Maintainability of RESTful and SOAP-WSDL Web Services <i>Ricardo Ramos de Oliveira, Robson Vinícius Vieira Sanchez, Júlio Cezar Estrella, and Renata Pontin de Mattos Fortes (Universidade de São Paulo, São Carlos - SP, Brazil), and Valério Brusamolín (Centro de Telemática, Curitiba - PR, Brazil)</i> A Tool-Supported Approach to Perform Efficient Regression Testing of Web Services <i>Animesh Chaturvedi and Atul Gupta (Indian Institute of Information Technology, Jabalpur, India)</i>
12:30 – 13:45	<b>Lunch</b>

# Agenda — Afternoon



13:45 – 15:00	<b>Session 3: Migration to Cloud Environments</b> <i>Chair: Grace Lewis, Carnegie Mellon Software Engineering Institute, USA</i> Delegating Data Management to the Cloud: A Case Study in a Telecommunications Company <i>Qing Gu, Patricia Lago and Simone Potenza (VU University, The Netherlands)</i> Cloud Modernization Assessment Framework: Analyzing the Impact of a Potential Migration to Cloud <i>Juncal Alonso, Leire Orue-Echevarria, Marisa Escalante (Tecnalia, Spain), Jesús Gorroñoigoitia (Atos, Spain) and Domenico Presenza (Engineering, Italy)</i> Invited Presentation: Tales of Empirically Understanding and Providing Process Support for Migrating to Clouds <i>M. Ali Babar (Lancaster University, United Kingdom)</i>
15:00 – 15:15	<b>Coffee Break</b>
15:15 – 16:15	<b>Session 4: Architecture</b> <i>Chair: Marin Litoiu, York University, Canada</i> Design and Runtime Architectures to Support Autonomic Management <i>Etienne Gandrille, Catherine Hamon (Orange Labs, France) and Philippe Lalanda (Grenoble University, France)</i> Invited Presentation: Supporting Software Evolution to the Multi-cloud with a Cross-Cloud Platform <i>Mike Smit (Dalhousie University, Canada)</i>
16:15 – 16:30	<b>Coffee Break</b>
16:30 – 17:10	<b>Session 5: Cloud Monitoring and Processes</b> <i>Chair: Muhammad Ali Babar, Lancaster University, Lancaster, United Kingdom</i> PaaS Cloud Migration — Migration Process, Architecture Problems and Solutions <i>Claus Pahl and Huanhuan Xiong (Dublin City University, Ireland)</i> Adaptive SLA Monitoring of Service Choreographies Enacted on the Cloud <i>Antonia Bertolino, Antonello Calabrò and Guglielmo De Angelis (Istituto di Scienza e Tecnologie della Informazione “A. Faedo”, Italy)</i>
17:10 – 17:30	<b>Symposium Summary and Next Steps</b> <i>Anca Daniela Ionita, University POLITEHNICA of Bucharest, Romania</i>

# Session Logistics



- **Session Format**

1. Introduction
2. Presentation
3. DISCUSSION

- **Other Notes**

- We expect a highly interactive session
- We will be taking notes throughout the day and present a summary at the end
- Talks and summary will be available in PDF format on the MESOCA web site  
(<http://www.sei.cmu.edu/community/mesoca2013/>)



# Thanks to Our Program Committee!



- Jose Delgado, Technical University of Lisbon, Portugal
- Massimiliano Di Penta, University of Sannio, Italy
- Yanguo Jing, London Metropolitan University, UK
- Patricia Lago, VU University Amsterdam, The Netherlands
- Nabor Mendonca, University of Fortaleza, Brazil
- Hausi Müller, University of Victoria, Canada
- Henriqueta Nóvoa, FEUP, Portugal
- Leire Orue-Echevarría, Tecnalia Research and Innovation, Spain
- Dana Petcu, West University of Timisoara, Romania
- Michael Smit, York University, Canada
- Harry Sneed, ANECON GmbH, Austria
- Gabriel Tamura, Icesi University, Colombia
- Scott Tilley, Florida Institute of Technology, USA
- Norha Villegas, Icesi University, Colombia
- Norman Wilde, University of West Florida, USA
- Andreas Winter, Carl von Ossietzky Univ., Germany



# Introductions



**Briefly state your name, organization, research/work area and symposium expectations**

# Keynote: Search-Based Optimization Techniques in the Context of SOA and Cloud Computing

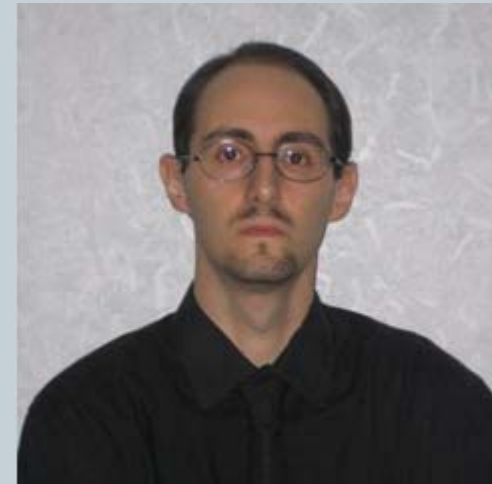


**MASSIMILIANO DI PENTA**  
**UNIVERSITY OF SANNIO, ITALY**

# Massimiliano Di Penta



- Associate Professor, University of Sannio, Italy
- Author of over 170 papers appeared in international conferences and journals
- Organizing and program committees of over 100 conferences such as ICSE, FSE, ASE, ICSM, ICPC
- General chair of SCAM 2010, WSE 2008, general co-chair of SSBSE 2010, WCRE 2008, and program co-chair of MSR 2013 and 2012, ICPC 2013, ICSM 2012, SSBSE 2009, WCRE 2006 and 2007, IWPSE 2007, WSE 2007, SCAM 2006, STEP 2005, and of other workshops
- Editorial board of the Empirical Software Engineering Journal (Springer) and of the Journal of Software: Evolution and Processes (Wiley)
- Member-at-large of the executive committee of the Technical Council of Software Engineering (TCSE)



# Session 1: Migration to SOA Environments



**CHAIR: MIKE SMIT**  
**DALHOUSIE UNIVERSITY, CANADA**

# Migration to SOA



- **Structuring SOA migration**
  - Pre-planning using concept-refining methodology to choose approach, tools, etc.
  - A defined process that reflects a decade of best practices in the literature
- **The next step in migration: workflow automation**
  - Moving workflow outside of application boundaries to do end-to-end workflow management on systems-of-systems
- **The value of case studies**
  - Used by all three papers to illustrate their contributions

# Papers



- **A Structured Legacy to SOA Migration Process and its Evaluation in Practice**  
Ravi Khadka, Amir Saeidi, Slinger Jansen and Jurriaan Hage  
(Utrecht University, The Netherlands)
- **Platform-Based Approach for Automation of Workflows in a System of Systems**  
Tarmo Ploom (Credit Suisse AG, Switzerland), Axel Glaser  
(PostFinance AG, Switzerland) and Stefan Scheit (Telstra Corporation, Australia)
- **Overhauling Legacy Enterprise Software Applications with a Concept Refinement Process Model**  
Daniel Knight, Gregory Knight and Nasseh Tabrizi (East Carolina University, Greenville, USA)

# Session 2: Web Services



**CHAIR: ANCA DANIELA IONITA  
UNIVERSITY POLITEHNICA OF BUCHAREST,  
ROMANIA**



# Service Foundation Issues



- **Reuse**
  - Reuse existing classes and methods in an existing object-oriented system as web services in a service-oriented architecture
  - Build the services into new business processes
- **Web services maintainability**
  - RESTful vs. SOAP-WSDL
- **Maintenance of Web services tests**
  - Automatic Web Service Change Management
  - Efficient regression testing of web services by selecting the relevant test cases to construct a reduced test suite from the existing one, built for a previous version of Web services

# Papers



- **Reusing Existing Object-Oriented Code as Web Services in a SOA**

Harry M. Sneed (ANECON GmbH, Austria), Chris Verhoef (Free University, The Netherlands) and Stephan H. Sneed (MetaSonic AG, Germany)

- **Comparative Evaluation of the Maintainability of RESTful and SOAP-WSDL Web Services**

Ricardo Ramos de Oliveira, Robson Vinícius Vieira Sanchez, Júlio Cezar Estrella, and Renata Pontin de Mattos Fortes (Universidade de São Paulo, São Carlos - SP, Brazil), and Valério Brusamolin (Centro de Telemática, Curitiba - PR, Brazil)

- **A Tool-Supported Approach to Perform Efficient Regression Testing of Web Services**

Animesh Chaturvedi and Atul Gupta (Indian Institute of Information Technology, Jabalpur, India)

# Session 3: Migration to Cloud Environments



**CHAIR: GRACE LEWIS**  
**CARNEGIE MELLON SOFTWARE ENGINEERING**  
**INSTITUTE, USA**

# Migration to Cloud Environments



- **Why migrate to cloud environments?**
  - Business agility — deployment and configuration
  - Focus on higher-value activities
  - Cost — from capital expenditures to operating expenditures
- **Remains challenging**
  - Not all applications and all data are meant for the cloud
  - Not all applications and all data are ready for the cloud

## **Top 10 Enterprise Applications for Public Cloud**

1. *Development and testing*
2. *Development platform services*
3. *Training servers*
4. *One-time big data projects*
5. *Websites*
6. *Customer relationship management*
7. *Project management, expense reporting and time management*
8. *Email*
9. *Human resources*
10. *Cloud-based anti-spam and anti-virus services*

Source: <http://www.infoworld.com/d/cloud-computing/top-10-enterprise-applications-public-clouds-196147>

# Papers



- **Delegating Data Management to the Cloud: A Case Study in a Telecommunications Company**  
Qing Gu, Patricia Lago and Simone Potenza (VU University, The Netherlands)
- **Cloud Modernization Assessment Framework: Analyzing the Impact of a Potential Migration to Cloud**  
Juncal Alonso, Leire Orue-Echevarria, Marisa Escalante (Tecnalia, Spain), Jesús Gorroñoitía (Atos, Spain) and Domenico Presenza (Engineering, Italy)
- **Invited Presentation: Tales of Empirically Understanding and Providing Process Support for Migrating to Clouds**  
M. Ali Babar (Lancaster University, United Kingdom)

# Invited Presentation: Tales of Empirically Understanding and Providing Process Support for Migrating to Clouds



**M. ALI BABAR**  
**LANCASTER UNIVERSITY, UNITED KINGDOM**

# M. Ali Babar



- Reader in Software Engineering at Lancaster University UK
- Software engineer and an IT consultant for several years in Australia
- Project leader and Co-Principal investigator on projects financed by European Union, Science Foundation Ireland, Danish Strategic Research Council, National ICT Australia
- More than 140 peer-reviewed research papers
- Guest editor of several special issues/sections of IEEE Software, JSS, ESEJ, SoSyM, IST, and REJ
- Program committees of WICSA/ECSA, ESEM, SPLC, ICGSE, and ICSP
- Chair of WICSA/ECSA 2012, ECSA2010, PROFES2010, and ICGSE2011.
- Member of steering committees of WICSA, ECSA, NordiCloud and ICGSE



# Session 4: Architecture



**CHAIR: MARIN LITOIU**  
**YORK UNIVERSITY, CANADA**



# Papers



- **Design and Runtime Architectures to Support Autonomic Management**  
Etienne Gandrille, Catherine Hamon (Orange Labs, France) and  
Philippe Lalanda (Grenoble University, France)
- **Invited Presentation: Supporting Software Evolution to the Multi-cloud with a Cross-Cloud Platform**  
Mike Smit (Dalhousie University, Canada)

# Invited Presentation: Supporting Software Evolution to the Multi-cloud with a Cross-Cloud Platform



**MIKE SMIT**  
**DALHOUSIE UNIVERSITY, CANADA**

# Mike Smit



- Assistant Professor, School of Information Management, Faculty of Management, Dalhousie University
- Ontario postdoctoral fellow at York University, Toronto, Canada, and a member of the Adaptive Systems Research Lab
- PhD from University of Alberta, 2011
- Exploring the intersection of technology, people, and information
- Using and organizing cloud-scale data
- Managing cloud-based resources
- Making cloud technology more accessible to Canadian academics and small businesses
- Providing secure, segmented Big Data sharing
- Distributed scalable monitoring systems for heterogeneous resources.



# Session 5: Cloud Monitoring and Processes



**CHAIR: MUHAMMAD ALI BABAR  
LANCASTER UNIVERSITY, UNITED KINGDOM**

# Cloud Monitoring and Processes



- **PaaS Migration: Architectural Concerns and Patterns**
  - Statelessness and data externalisation are solutions for elasticity and performance
  - Relational to NoSQL – data migration and verification
  - Skill shortage can pose significant problems
- **Monitoring Adaptive Service-Level Agreements**
  - Monitoring infrastructure must adapt according to the changes in underlying environment
  - Multi-source monitoring for adaptive SLA following the evolution of the Cloud infrastructure

# Papers



- **PaaS Cloud Migration — Migration Process, Architecture Problems and Solutions**  
Claus Pahl and Huanhuan Xiong (Dublin City University, Ireland)
- **Adaptive SLA Monitoring of Service Choreographies Enacted on the Cloud**  
Antonia Bertolino, Antonello Calabrò and Guglielmo De Angelis  
(Istituto di Scienza e Tecnologie della Informazione “A. Faedo”, Italy)