Empirical Software Engineering International Week
September 13-17, 2010 Bolzano - Bozen, Italy

18th International Software Engineering Research Network Annual Meeting (ISERN 2010)
8th International Advanced School on Empirical Software Engineering (IASESE 2010)
5th International Doctoral Symposium on Empirical Software Engineering (IDoESE 2010)

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**venue and logistic information**

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<td>FORST restaurant</td>
<td>September 16&lt;sup&gt;th&lt;/sup&gt; at Castel Roncolo – Runkelstein Schloss</td>
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**international week venue**
university main building, p.za Università (ex p.za Sernesi)

**registration at**
university main building, first floor in front of room D101, 7:30 – 10:30 everyday

**major distances from the conference venue**

**5-10 min walking distance from**
hotel Città – Stadt hotel, Greif hotel, hotel Alpi,

main train station (in Italian ‘Bolzano-Bozen centrale’),

major parking places (p.za Whalter, Central Parking, Laurin)

**20 min by car / taxi from / to**
Bolzano-Bozen airport (radio taxi nr. +39 0471 981111)

**2 min walking distance from / to**
FORST restaurant

**40 min walking distance to (along the river promenade)**
Castel Roncolo – Runkelstein Schloss
ISERN 2010

Monday, September 13th

8:00 - 9:00  breakfast and registration  
9:00 - 10:00  welcome and new introductions  
10:00 - 10:15  report from 2009 session chairs  
10:15 - 10:45  coffee break  
10:45 - 12:15  what are the empirical results from the 20th century that are invariant of technology?  
12:15 - 13:30  lunch  
13:30 - 15:00  can we evaluate the quality of SE experiments?  
15:00 - 15:30  coffee break  
15:30 - 17:00  session A. what should software engineers be measuring in the future?  
17:00 - 17:15  wrap-up and plan for Tuesday  
17:15 - 18:15  ISERN SC meeting - by invitation only  
19:00 - 23:00  ISERN dinner

Tuesday, September 14th

8:00 – 9:00  breakfast and registration  
9:00 - 9:30  feedback from Monday's study: can we evaluate the quality of SE experiments?  
9:30 - 10:30  session A. systematic literature reviews in SE: status and outlook  
10:30 - 11:00  coffee break  
11:00 - 12:15  session A. qualitative and quantitative synthesis of research evidence  
12:15 - 13:30  lunch  
13:30 - 15:00  session A. "I've seen the future, and it's software-shaped" Software Factory - an empirical SE research infrastructure  
15:00 - 15:30  coffee break  
15:30 - 17:00  what are the great challenges of the 21st century that can be resolved using empirical studies?  
17:00 - 17:30  ISERN business
ISERN detailed program

**Monday, September 13th**

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<td>chair: Dieter Rombach</td>
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ISERN is open to academic and industrial groups world-wide that are active in empirical software engineering research and willing to adopt the empirical research framework.

ISERN members are pairs of organization and contact person. If the contact person leaves the organization, the organization must reapply for membership. Interested organizations may apply by sending an electronic proposal to "isern at informatik.uni-kl.de" describing their past experience in empirical software engineering research as well as their expectations from a future ISERN membership. Candidates will be invited to observe the ISERN Meeting following their application.

The goal of the session is to facilitate the membership application process by giving an opportunity for candidates to present their research and for observers to introduce themselves. Membership is granted according to a 3-step procedure:

1. Attending as invited observer at an annual ISERN meeting.
2. Attending as invited candidate at the following ISERN meeting giving a presentation. Membership is granted if a two-thirds majority of current members approve the application in an email voting after the meeting.
3. Attending as a full ISERN member at following meetings.

Current members present contact/affiliation changes (2 min each):

- JAXA: Yuko Miyamoto
- NTNU: Daniela Cruzes
- SIMULA: Lionel Briand
- University of Oslo: Dag Sjøberg

Candidates give a 5 min presentation each:

- Technical University of Helsinki: Tomi Mannistö
- ABB Corporate: Brian Robinson
- Queens University: Desmond Greer
- University of Bari: Filippo Lanubile

Observers give brief introduction without a presentation:

- Software Engineering Research & Practices s.r.l. (SER&Practices)

Further information regarding changes (newly accepted members, leaving members)

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<td>ESE Strategy &amp; Roadmap Communications (Andreas Jedlitschka)</td>
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<td>Transfer: A Reference Curriculum for (E)SE (Ricardo Valerdi)</td>
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<td>Transfer: Problems in publishing industrial studies (Nachi Nagappan)</td>
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<td>Methods: Technology in ESE (Mike Barker)</td>
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<td>Application: Software Architecture (Andreas Jedlitschka)</td>
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<td>Application: GQM+ (Barbara Russo)</td>
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• Method: Aggregation/Generalization from empirical studies (Marcus Ciolkowski)
• Transfer: Guidelines for reporting empirical studies (Andreas Jedlitschka)

10:15 - 10:45 **coffee break**

10:45 - 12:15 **what are the empirical results from the 20th century that are invariant of technology?**
chairs: Larry Votta, Mike Barker

**room D101**

In this kick-off session, we will look back at what we have accomplished in the last half-century. Starting with a report on the findings from Dagstuhl, we will look at what has been achieved and why it is important. We will then hold a group discussion, first confirming or modifying the results from Dagstuhl, then adding any "missing pieces," and finally looking at what use we believe this information can be in research, education, and industry. As a final consideration, we will look at how we think this information should be publicized and disseminated in research, education, and industry. We will also pose a challenge for the rest of the conference to identify and propose challenges for the 21st century in preparation for the closing session.

12:15 - 13:30 **lunch**

13:30 - 15:00 **can we evaluate the quality of SE experiments?**
chairs: Dag Sjøberg, Dietmar Pfahl

**room D101**

To make progress in software engineering (SE) in general and empirical SE in particular, we need to improve the quality of experiments and other empirical studies. At many ISERN meetings we have discussed guidelines for improving such quality. Being able to evaluate the quality of empirical studies is a premise to evaluate guidelines and other means to improve quality. Moreover, when carrying out ordinary reviews for conferences or journals, as well as literature reviews, we are also supposed to be able to evaluate quality. However, what is the case at present? In a pilot study conducted by 8 experienced researchers (5 of them associated with ISERN), we disagreed on the quality of a set of four selected papers that reported experiments. When we had a joint discussion in pairs, the reliability (agreement) increased.

In this session, we want to explore whether working as individuals, or in groups (with different sizes) affects the reliability of evaluating quality of SE experiments.

15:00 - 15:30 **coffee break**

15:30 - 17:00 **session A. what should software engineers be measuring in the future?**
chair: Barry Boehm

**room D003**

This session draws on ISERN's experience in addressing the question of "What should software engineers be measuring in the

**session B. Ontologies in empirical software engineering**
chair: Ye Yang

**room D002**

Ontology has been popular in many fields such as AI, Agent systems, Database or Web Technologies. In recent years, many
future?" Increasingly, we are finding from large Government projects to small e-services projects that software engineers are less involved with greenfield designing and programming, and more involved with the evaluation, integration, and evolution of combinations of off-the-shelf (OTS) products, cloud-computing services, and legacy systems, along with generating code from model directives. Terms like "delivered" or "equivalent" source lines of code, defect density, productivity, etc., that are gathered in many repositories are hard to compare. Terms like requirements volatility or code churn are increasingly important and hard to define or measure.

The session begins by comparing across various industry sectors and countries the extent to which such trends are presenting problems, and what is best to do about them. This will be followed by having breakout groups discuss and summarize their experiences and initiatives in measuring software size, effort, duration, productivity, quality, etc. for different classes of emerging software development modes (traditional, agile, evolutionary, OTS/services-driven, legacy-driven, hybrid, etc.).

In this session, we would like to hear the participants' opinions about this, and look for potential collaborators in this regard.

17:00 - 17:15 wrap-up and plan for Tuesday
room D101

17:15 - 18:15 ISERN SC meeting - by invitation only
room D003

19:00 - 23:00 ISERN dinner
Location: Laimburg Winery
Tuesday, September 14th

8:00 – 9:00  breakfast and registration
9:00 - 9:30  feedback from Monday's study: can we evaluate the quality of SE experiments?
room D101
9:30 - 10:30  session A. systematic literature reviews in SE: status and outlook
chairs: M. Ali Babar, Reidar Conradi
room D003

A growing number of systematic reviews are being conducted and reported by software engineering researchers who have been reporting the methodological and technological challenges involved in conducting and reporting high quality systematic reviews. There is a vital need to discuss the challenges involved in doing systematic reviews in software engineering at a community platform like ISERN in order to identify the potential strategies and actions required for addressing the scientific and technological challenges involved. Moreover, it is also important to review and discuss the methodology adoption in software engineering and brainstorm the improvements required.

This session aims to review the state-of-the-practice of systematic reviews over the past 6 years, stimulate a debate on the rigor and relevance of this relatively young research methodology in software engineering, and encourage an open dialogue between ISERN members to assess its relevance.

After a set of questions to instigate discussion and brainstorming activities, we aim to discuss and assess the efforts and commitments required to provide the scientific and technological infrastructures required for maturing and using systematic

9:30 - 10:30  session B. empirical studies in industry
chairs: Andreas Jedlitschka, Laurie Williams, Günter Ruhe
room D002

A major role of empirical software engineering research is to provide decision makers in software development with the type of evidence about technologies that they need to support informed decision-making when introducing new technologies. From managers' perspective, results from studies performed in industry would be preferred above any other. Several models for cooperation between research and industry in the context of empirical studies were proposed in the late 1990 and early 2000. Further, the community discussed for several years about how to best perform studies in industry and about potential models for long-term collaboration. Yet, still there seem to be some challenges arising from putting the theory into practice.

The goal of the session is to collect lessons learned from examples of studies performed in/with industry; identifying what went well and where a change is needed? The result of the session is list of lessons learned, e.g., items to think of already during initiation and study design.

The session will start with a very brief wrap-up of the discussions from recent meetings (starting with Dagstuhl 2006). Then facilitators will present some examples of studies performed in/with industry
reviews to advance software engineering research and practice based on evidence. answering a set of predefined questions (like for a project retrospective). The major part of the session is dedicated to the discussion of lessons learned and improvement suggestions both for planning, conducting, analyzing, and reporting empirical studies in/with industry. Results are also expected to contribute to the knowledge regarding long-term collaboration.

10:30 - 11:00 coffee break
11:00 - 12:15 session A. qualitative and quantitative synthesis of research evidence
chairs: Marcus Ciolkowski, Daniela Cruzes
room D003

Synthesizing the evidence from a set of studies that spans many countries and years, and that incorporates a wide variety of research methods and theoretical perspectives, is probably the single most challenging task of performing a systematic review. Research synthesis is a collective term for a family of methods for summarizing, integrating, combining, and comparing the findings of different studies on a topic or research question. Such synthesis can also identify crucial areas and questions that have not been addressed adequately with past empirical research. It is built upon the observation that no matter how well designed and executed, empirical findings from single studies are limited in the extent to which they may be generalized. Research synthesis is, thus, a way of making sense of what a collection of studies is saying.

The goal of this session is to discuss research challenges in synthesis in ESE. The session will have the following structure:
- Definition of synthesis (introduction)
- Overview of quantitative and qualitative synthesis
- Discussion on challenges on

11:00 - 12:15 session B. global sharing of empirical software engineering repository
chair: Yoshiki Mitani
room D002

Recently, constructions of the software engineering repository have prospered in various countries. For example in Japan two kinds of documents were published in English, one was related to the benchmarking and the other was related to the visualization of software development projects:

http://www.ipa.go.jp/english/sec/reports/20100507a.html
http://www.ipa.go.jp/english/sec/reports/20100507b.html

The goal of the session is to get some practical proposals (ideas) on how to share each domestic information repository globally, and to discuss how to share such kind of information to conquer the barrier of individuality and confidentiality of software engineering research. The session will consist of:
- Short presentation of the case of domestic software engineering repository collection. (Exchange the domestic case information)
- Free discussion in small groups
- Short presentations from small group discussions
syntheses in SE led by ISERN members: Victor Basili, Natalia Juristo, Carolyn Seaman, Guilherme Travassos

• Wrap-up of the Session

• Summary discussion

12:15 - 13:30  lunch
13:30 - 15:00  session A. "I've seen the future, and it's software-shaped" Software Factory - an empirical SE research infrastructure

chairs: Pekka Abrahamsson, Juergen Muench
room D003

How does the software development of 2010's look like? How does it feel to develop software in a company with no history? How to develop software with no specs - with just the desire to be all you can be? Sounds like an ad-hoc company, doesn’t. But, no, wait a moment: Software of the 2010’s targets for innovative software, which is rarely developed. Software of today & past try to meet the specs with poor success. It has been so for 30 years. Let's stop it and dig deep.

Software engineering is one of the few disciplines, which continue to lack the university hospital of software development. There is no facility specifically designed to enable the research into software development that is realistic and open where data can be freely shared for verification or other purposes. We can keep up debating about the need for setting up such an infrastructure or just go ahead and begin building it. The Software Factory is a strategic investment to a new infrastructure supporting empirically driven software engineering research, education and entrepreneurship globally.

session B. observability of engineering processes in distributed teams

chair: Stefan Biffl
room D002

The main goal of this session is to identify and classify candidate measurement and analysis approaches for engineering process observation in heterogeneous environments to:

(a) enable process monitoring and control and
(b) identify process improvement approaches in automation systems domain projects.

Introduction to the Engineering Service Bus concept with focus on engineering process definition, observation, and improvement, and example workflows: e.g., Continuous Integration and Test, Signal Engineering in industrial automation systems projects. Breakout groups will gather needs and ideas on processes to observe, data collection and analysis. Discussion of summary and further work in the ISERN context.

For more details of the session, please visit the ESEIW web site
The reference implementation of the Factory is now in place and it is currently expanding to its global capacity housing up to 150 software engineers by end of 2011. Early results are very promising. In the ISERN session, we seek feedback, criticism, concerns, ideas and of course potential Software Factory locations globally. In Europe, we have Factories being set up in several locations already. For reading in your long plane travel, go to http://www.softwarefactory.cc/magazines for details.

15:00 - 15:30 coffee break
15:30 - 17:00 room D101 what are the great challenges of the 21st century that can be resolved using empirical studies?
chairs: Larry Votta, Mike Barker

This session will wrap up the conference, building on the summary of what was achieved in the 20th century that we will define during the takeoff, and on observations from the other sessions. It will look at our future in terms of great challenges. This session will start with some examples of great challenges, such as the 14 engineering challenges proposed by the National Academy of Engineering. We will then have proposals by a panel of experts, and do some team brainstorming. We will collect ideas from the group, and uses these to begin defining a sketch of what we consider the great challenges of the 21st century for empirical software engineering.

17:00 - 17:30 room D101 ISERN business
chair: Dieter Rombach
ISERN venue and lunch

Ground floor

First floor
Wednesday. September 15th

**IASESE 2010**

chair: Helen Sharp, Yvonne Dittrich, Jennifer Ferreira, Cleidson R. B. de Souza

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<td>8:30 - 10:00</td>
<td>The basics of ethnography: what is it? when use it? why use it?</td>
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<td>10:00 - 10:30</td>
<td><strong>coffee break</strong></td>
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<td>10:30 - 12:00</td>
<td>Qualitative methods in software engineering: myths &amp; expectations</td>
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<td>Doing ethnography (data collection)</td>
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<td>13:30 - 15:00</td>
<td>Doing ethnography (data analysis and reporting)</td>
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<td>15:30 - 17:00</td>
<td>Translating findings into insights</td>
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<td>Dealing with &quot;so what?&quot;</td>
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IDoESE 2010  
chair: Stefan Biffl

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<td>Ani Liza Asnawi</td>
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<td>• empirical assessment of the impact of automatic static analysis on</td>
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<td>• a comparative case study of teamwork in norwegian agile software</td>
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<td>• software trajectory analysis: an empirically based method for</td>
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<td>Pavel Senin</td>
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<td>11:00 - 12:00</td>
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Workshops

Epic 2010
chair: Andrea Herrmann and Maya Daneva

13:30 - 14:20 keynote talk

14:20 - 14:40 the effect of implementation technology on software development effort: an industrial case
İlkay Ünal, Erdir Ungan, Onur Demirörs

14:40 - 15:00 overcoming roadblocks for small software firm growth – experiences from a national initiative “growth forum”
Jyrki Kontio

15:00-15:30 coffee break

15:30 - 15:50 implications of clients’ participation for software project: a comparative case study between an agile and a ‘traditional’ software company
Zornitza Racheva

15:50 - 16:10 towards a mixed testing process integrating test case based testing and exploratory testing
Syed Muhammad Ali Shah, Usman Sattar Alvi, Cigdem Gencel

16:10 - 16:30 the introduction of metrics in a Scrum based process
Christian Facchi, Jochen Wessel

MetriSec 2010
chair: Riccardo Scandariato, Laurie Williams

8:00 – 9:00 breakfast and registration

9:00 - 10:00 welcome and keynote

security metrics for business processes in context
Stephan Neuhaus, University of Trento, Italy

10:00 - 10:30 coffee break

10:30 - 12:00 session 1 – measures session
chair: Stephan Neuhaus, University of Trento, Italy

impact of plugins on the security of web applications
James Walden, Maureen Doyle, Rob Lenhof, John Murray, Andrew Plunkett

measuring the user’s anonymity when disclosing personal properties
Kristof Verslype, Bart De Decker

predicting vulnerable software components with dependency graphs
Viet Hung Nguyen, Le Minh Sang Tran

12:00 - 13:30 lunch

13:30 - 15:00 session 2 – methods session
chair: James Walden, Northern Kentucky University, USA

which is the right source for vulnerability studies? an empirical analysis on mozilla firefox
Fabio Massacci, Viet Hung Nguyen
adversary-driven state-based system security evaluation
Elizabeth LeMay, Willard Unkenholz, Donald Parks, Carol Muehrcke, Ken Keefe, William H. Sanders

addressing misalignment between information security metrics and business-driven security objectives
Christian Fruehwirth, Stefan Biffl, Mohammed Tabatabai, Edgar Weippl

15:00 - 15:30 coffee break
15:30 - 17:00 session 3 - assessment session
chair: Riccardo Scandariato, Katholieke Universiteit Leuven, Belgium

on the effectiveness of multi-variant program execution for vulnerability detection and prevention
Todd Jackson, Babak Salamat, Gregor Wagner, Christian Wimmer, Michael Franz

access control caching strategies: an empirical evaluation
Mathias Kohler, Achim D. Brucker.

security implications of selective encryption
Reine Lundin, Stefan Lindskog
IASESE, IDoESE, and workshops venue and lunch

Ground floor

First floor
## Program at a Glance

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<td><strong>September 15th</strong></td>
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<td>empirical research question from software engineering</td>
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<td><strong>Welcome Reception and Poster Session</strong></td>
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<td><strong>Thursday,</strong></td>
<td></td>
<td><strong>Keynote</strong> Steven Fraser, Cisco Research Center, USA</td>
<td>D101</td>
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<tr>
<td><strong>September 16th</strong></td>
<td></td>
<td>software best practices: tales of adoption and agility through iteration</td>
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<td><strong>Conference</strong> (parallel sessions A,B,C)</td>
<td>D101, D102, A101</td>
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<td><strong>Social Dinner at Castel Roncolo - Runkelstein Schloss</strong></td>
<td>Castel Roncolo - Runkelstein Schloss</td>
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<td><strong>Friday,</strong></td>
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<td><strong>Keynote</strong> Carlo Ghezzi, Politecnico di Milano, Italy</td>
<td>D101</td>
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<td><strong>September 17th</strong></td>
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<td>the disappearing boundary between development-time and runtime</td>
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<td><strong>Conference</strong> (parallel sessions A,B,C)</td>
<td>D101, D102, A101</td>
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ESEM detailed program

Wednesday, September 15th

18:00-19:00  
**place:** Museo Mercantile-Merkantilmuseum  
**keynote**  
empirical research question from software engineering  
Bertrand Meyer

19:00-20:30  
**place:** Museo Mercantile-Merkantilmuseum  
**welcome reception and poster session**

From the Free University of Bolzano-Bozen to Museo Mercantile via Portici 39 (5 min. by foot)
### Thursday, September 16th

<table>
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<th>Time</th>
<th>Event</th>
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<td>8:00-8:30</td>
<td>breakfast and registration</td>
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<td>8:30-9:00</td>
<td>welcome of the general chair</td>
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<td><strong>room D101</strong></td>
<td><strong>keynote</strong></td>
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<tr>
<td>9:00-10:00</td>
<td>software best practices: tales of adoption and agility through iteration</td>
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<td></td>
<td>Steven Fraser</td>
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<td>10:00-10:30</td>
<td>coffee break</td>
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<td>10:30-12:00</td>
<td>session 1</td>
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<td><strong>room D101</strong></td>
<td>session 1.A - generalization/replications</td>
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<td>chair: Andreas Jedlitschka</td>
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<td></td>
<td>synthesizing evidence in software engineering research</td>
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<td></td>
<td>Daniela Cruzes and Tore Dybå</td>
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<td>can we evaluate the quality of software engineering experiments?</td>
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<td>Barbara Kitchenham, Dag Sjoberg, Pearl Brereton, David Budgen, Tore Dybå, Martin Höst,</td>
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<td>Dietmar Pfahl and Per Runeson</td>
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<td>replications types in experimental disciplines</td>
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<td>Omar Gómez, Natalia Juristo and Sira Vegas</td>
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<td><strong>room D102</strong></td>
<td>session 1.B - defects, faults, issues</td>
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<tr>
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<td>chair: Alberto Sillitti</td>
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<td>understanding the impact of code and process metrics on post-release defects: a case study</td>
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<td>on the eclipse project</td>
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<td>Emad Shihab, Zhen Ming Jiang, Walid M. Ibrahim, Bram Adams and Ahmed E. Hassan</td>
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<td>an effective fault aware test case prioritization by incorporating a fault localization</td>
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<td>technique</td>
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<td>Sejun Kim and Jongmoon Baik</td>
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<td>a machine learning approach for text categorization of fixing-issue commits on CVS</td>
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<td>Alessandro Murgia, Giulio Concas, Michele Marchesi and Roberto Tonelli</td>
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<tr>
<td><strong>room A101</strong></td>
<td>session 1.C (short papers) - research methods and generalizations</td>
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<td>chair: Gabriella Dodero</td>
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<td>data accumulation and software effort prediction</td>
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<td></td>
<td>Stephen MacDonell and Martin Shepperd</td>
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stakeholder perceptions of software project outcomes: an industrial case study
Laurie McLeod and Stephen MacDonell

a critical appraisal of systematic reviews in software engineering from the perspective of
the research questions asked in the reviews
Fabio Q. B. da Silva, André L. M. Santos, Sérgio C. B. Soares, A. César C. França and Cleviton
V. F. Monteiro

towards the conception of scientific workflows for in silico experiments in software engineering
Wallace M. Pereira and Guilherme Travassos

exploring the use of crowdsourcing to support empirical studies in software engineering
Kathryn Stolee and Sebastian Elbaum

12:00 - 13:30  lunch
13:30 - 15:00  session 2

room D101  session 2.A - maintainability and dependability
chair: Davide Falessi

object oriented design pattern decay: a taxonomy
Travis Schanz and Clemente Izurieta

building empirical support for automated code smell detection
Jan Schumacher, Nico Zazworka, Forrest Shull, Carolyn Seaman and Michele Shaw

strengthening the empirical analysis of the relationship between Linus’ law and software
security
Andrew Meneely and Laurie Williams

room D102  session 2.B - large scale analysis
chair: Martin Shepperd

test case selection and prioritization: risk-based or design-based?
Jussi Kasurinen, Ossi Taipale and Kari Smolander

an empirical investigation into a large-scale Java open source code repository
Mark Grechanik, Collin McMillan, Denys Poshyvanyk, Luca DeFerrari, Chen Fu, Qing Xie,
Carlo Ghezzi, Marco Comi and Stefano Crespi

a survey of scientific software development
Luke Nguyen-Hoan, Shayne Flint and Ramesh Sankaranarayana
room A101  session 2.C (short papers) - agile, collaborative, and distributed development
chair: Bruno Rossi

predicting OSS trustworthiness on the basis of elementary code assessment
Luigi Lavazza, Sandro Morasca, Davide Taibi and Davide Tosi

an empirical study on the relationship between the use of agile practices and the success of scrum projects
A. César C. França, Fabio Q. B. da Silva and Leila M. R. de Sousa Mariz

using virtual images for collaborative research
Vinay Augustine and Brian Robinson

a conceptual model of client-driven agile requirements prioritization: results of a case study
Zornitza Racheva, Maya Daneva and Andrea Herrmann

are heroes common in FLOSS projects?
Filippo Ricca and Alessandro Marchetto

15:00 - 15:30  coffee break

15:30 - 17:00  session 3

room D101  session 3.A - agile methods
chair: Filippo Lanubile

transition from a plan-driven process to Scrum – a longitudinal case study on software quality
Jingyue Li, Nils B. Moe and Tore Dybå

are developers complying with the process: an XP study
Nico Zazworka, Kai Stapel, Eric Knauss, Forrest Shull, Victor Basili and Kurt Schneider

perceived productivity threats in large agile development projects
Jo Hannay and Hans Christian Benestad

room D102  session 3.B - requirements analysis and engineering
chair: Clemente Izurieta

an empirical study of specification by example in a software engineering tool
Hazem Qattous, Philip Gray and Ray Welland

on the effectiveness of screen mockups in requirements engineering: results from an
internal replication
Filippo Ricca, Giuseppe Scanniello, Marco Torchiano, Gianna Reggio and Egidio Astesiano

a comprehensive characterization of NLP techniques for identifying equivalent requirements
Davide Falessi, Giovanni Cantone and Gerardo Canfora

room A101 session 3.C (short papers) - qualitative, social and alternative perspectives
chair: Sira Vegas

is GQM+strategies really applicable as is to non-software development domains?
Salvatore Alessandro Sarcià

the influence of environmental parameters on concurrency fault exposures - an exploratory study
Akbar Siami Namin and Sahitya Kakarla

evaluation of optimized staffing for feature development and bug fixing
Md. Mainur Rahman, S M Sohan, Frank Maurer and Guenther Ruhe

a focus group study on inter-organizational ERP requirements engineering practices
Maya Daneva and Niv Ahituv

continued involvement in software development: motivational factors
Rien Sach, Helen Sharp and Marian Petre

18:30 shuttle to Castel Roncolo – Runkelstein Schloss
19:30 - 22:00 dinner at Castel Roncolo - Runkelstein Schloss
Friday, September 17th

8:00-9:00  breakfast
9:00-10:00 keynote

**room D101**  the disappearing boundary between development-time and run-time
Carlo Ghezzi

10:00 - 10:30  coffee break

10:30 - 12:00  session 1

**room D101**  session 1.A - management, business and research in industry
chair: Dietmar Pfahl

evaluating a model of software managers’ information needs – an experiment
Andreas Jedlitschka

utilizing GQM+strategies for business value analysis: an approach for evaluating business goals
Vladimir Mandic, Victor Basili, Lasse Harjumaa, Markku Oivo and Jouni Markkula

improving industrial adoption of software engineering research: a comparison of open and closed source software
Brian Robinson and Patrick Francis

**room D102**  session 1.B - agile, collaborative and distributed development
chair: Guilherme Travassos

the effects of neuroticism on pair programming: an empirical study in the higher education context
Norsaremah Salleh, Emilia Mendes, John Grundy and Giles Burch

trust dynamics in global software engineering
Samireh Jalali, Cigdem Gencel and Darja Smite

investigating the use of tags in collaborative development environments: a replicated study
Fabio Calefato, Domenico Gendarmi and Filippo Lanubile

**room A101**  session 1.C (short papers) - risk analysis, defects, faults, and failures
chair: Maya Daneva

obtaining valid safety data for software safety measurement and process improvement
Victor R. Basili, Marvin V. Zelkowitz, Lucas Layman, Kathleen Dangle and Madeline Diep.
impact analysis by means of unstructured knowledge in the context of bug repositories
Marco Torchiano and Filippo Ricca.

the usual suspects: a case study on delivered defects per developer
Rudolf Ramler, Claus Klammer and Thomas Natschläger.

evaluating the usefulness of a functional size measurement procedure to detect defects in MDD models
Beatriz Marín, Giovanni Giachetti, Oscar Pastor Lopez, Tanja Vos and Alain Abran.

impact of maintainability defects on code inspections
Ozlem Albayrak and David Davenport.

impact analysis of SCRs using single and multi-label machine learning classification
Syed Nadeem Ahsan and Franz Wotawa.

12:00 - 13:30 lunch
13:30 - 15:00 session 2

room D101

session 2.A - measurement and estimation
chair: Ayşe Bener

introducing the evaluation of complexity in functional size measurement: a UML-based approach
Luigi Lavazza and Gabriela Robiolo.

categorization of real-time software components for code size estimation
Kenneth Lind and Rogardt Heldal.

evaluating the suitability of a measurement repository for statistical process control
Monalessa Barcellos, Ana Regina Rocha and Ricardo Falbo

room D102

session 2.B - human and user studies
chair: Emilia Mendes

gender differences and programming environments: across programming populations
Margaret Burnett, Scott Fleming, Shamsi Iqbal, Gina Venolia, Vidya Rajaram, Umer Farooq, Valentina Grigoreanu and Mary Czerwinski

a qualitative study of animation programming in the wild
Aniket Dahotre, Yan Zhang and Christopher Scaffidi

usability evaluation of multi-device/platform user interfaces generated by model-driven engineering
Nathalie Aquino, Jean Vanderdonckt, Nelly Condori-Fernández, Óscar Dieste and Óscar Pastor

room A101  session 2.C (short papers) - design and modelling
chair: Rudolf Ramler

a controlled experiment for assessing the contribution of design pattern documentation on software maintenance
Carmine Gravino, Michele Risi, Giuseppe Scanniello and Genny Tortora.

comparing two communication media in use case modeling: results from a controlled experiment
Giuseppe Scanniello, Ugo Erra and Ana Portnova.

towards to the validation of a usability evaluation method for model-driven web development
Adrian Fernandez, Silvia Abrahao and Emilio Insfran.

on the effort of augmenting use cases with screen mockups: results from a preliminary empirical study
Filippo Ricca, Giuseppe Scanniello, Marco Torchiano, Gianna Reggio and Egidio Astesiano.

adaptability performance trade-off: a controlled experiment
Adam Brennan, Des Greer, and Kevin McDaid.

15:00 - 15:30 coffee break

15:30 - 16:30 session best papers awards
room D101 ESEM best paper award

MSR best paper award
clones: what is that smell?
Foyzur Rahman, Christian Bird, Premkumar Devanbu
thanks to the program committees

Full papers
Ahmed E. Hassan, School of Computing, Queen's University (Canada)
Andreas Jedlitschka, Fraunhofer IESE (Germany)
Andreas Zeller, Saarland University (Germany)
Andrew Begel, Microsoft (USA)
Audris Mockus, Avaya Labs Research (USA)
Ayse Bener, Bogazici University (Turkey)
Brian Robinson, ABB Corporate Research (USA)
Carolyn Seaman, University of Maryland, Baltimore (USA)
Christof Ebert, Vector (Germany)
Claes Wohlin, Blekinge Institute of Technology (Sweden)
Davide Falessi, Simula Research Laboratory & University of Rome Tor Vergata (Italy)
Dietmar Pfahl, Simula Research Laboratory & University of Oslo (Norway)
Emilia Mendes, University of Auckland (New Zealand)
Filippo Lanubile, University of Bari (Italy)
Filippo Ricca, University di Genova (Italy)
Forrest Shull, Fraunhofer Center, Maryland (USA)
Gerardo Canfora, University of Sannio (Italy)
Guilherme Travassos, COPPE/Federal University of Rio de Janeiro (Brazil)
Hakan Erdogmus, Kalemun Research Inc. (Canada)
Harald Gall, University of Zurich (Switzerland)
Harvey Siy, Lucent Technologies (USA)
Iannis Stamelos, Aristotle University of Thessaloniki (Greece)
James Miller, University of Alberta (Canada)
Jeffrey Carver, University of Alabama (USA)
Laurie Williams, North Carolina State University (USA)
Lionel Briand, Simula Research Laboratory (Norway)
Lorin Hochstein, USC Information Sciences Institute (USA)
Marcela Genero, University of Castilla-La Mancha (Spain)
Marco Torchiano, Politecnico di Torino (Italy)
Marcus Ciolkowski, Fraunhofer IESE (Germany)
Martin Höst, Lund University (Sweden)
Martin Pinzger, University of Zurich (Switzerland)
Martin Shepperd, Brunel University (UK)
Massimiliano Di Penta, University of Sannio (Italy)
Natalia Juristo, Universidad Politecnica de Madrid (Spain)
Miryung Kim, University of Texas (USA)
Muhammad Ali Babar, ITU Copenhagen (Denmark)
Murray Wood, University of Strathclyde (U.K.)
Oscar Pastor Lopez, Universidad Politécnica de Valencia (Spain)
Paul Gruenbacher, University of Linz (Austria)
Per Runeson, University of Lund (Sweden)
Philip Johnson, University of Hawaii (USA)
Rahul Premraj, VU University, Amsterdam (The Netherlands)
Reidar Conradi, Norwegian University of Technology & Science (Norway)
Ross Jeffery, University of New South Wales (Australia)
Sandro Morasca, Università degli Studi dell’Insubria (Italy)
Shuji Morisaki, Nara Institute of Science and Technology (Japan)
Sira Vegas, Universidad Politécnica de Madrid (Spain)
Sreedevi Sampath, University of Maryland, Baltimore (USA)
Stefan Biffl, Vienna University of Technology (Austria)
Stefan Wagner, Technical Universität Munchen (Germany)
Sung Kim, Massachusetts Institute of Technology (USA)
Teresa Baldassarre, University of Bari (Italy)
Thomas Zimmermann, Microsoft Research (USA)
Tim Menzies, West Virginia University (USA)
Tore Dybå, Sintef (Norway)

Short papers and posters
Alessandro Sarcia, University of Rome "Tor Vergata" (Italy)
Andrea Capiluppi, University of East London (UK)
Bruno Rossi, Free University of Bolzano-Bozen (Italy)
Dietmar Winkler, Vienna University of Technology (Austria)
Emilia Mendes, University of Auckland (New Zealand)
Lorin Hochstein, USC Information Sciences Institute (USA)
Luigi Buglione, ETS / Neken Engineering Group (Italy)
Marcus Ciolkowski, Fraunhofer IESE (Germany)
Muhammad Ali Babar, ITU Copenhagen (Denmark)
Odd Petter N. Syngenstad, NTNU (Norway)
Oscar Dieste, Universidad Politécnica de Madrid (Spain)
Oscar Pastor, Universidad Politécnica de Valencia (Spain)
Pekka Abrahamsson, University of Helsinki (Finland)
Rudolf Ramler, SCCH Hagenberg (Austria)
Tony Gorschek, Blekinge Institute of Technology (Sweden)
message from the chairs

We would like to welcome you to Bolzano-Bozen, Italy, for the Fourth International Symposium on Empirical Software Engineering and Measurement (ESEM 2010).

This year we have a very polyhedral technical program including generalization of empirical studies, empirical methods, agile and collaborative development, software reliability and dependability, software design and modelling, and human and user studies that continues the advances in software empirical measurement characteristic of this conference series. Notably, the short paper sessions have a strong focus on case studies and reports from the field. Three keynotes will lead us through the main stream of the conference debating the future of empirical software engineering. Finally, the best paper award will conclude the conference together with the guest talk of the best paper of Mining Software Repositories 2010 (MSR 2010).

The call for research papers attracted 105 full paper and 60 short papers and posters submissions. The accepted papers are 30 as full papers (less than 30% acceptance rate) and 26 as short papers. This year also the poster session is very remarkable: 12 posters will be presented in one of the historical building of Bolzano-Bozen (Museo Mercantile Merkantilmuseum).

We would like to thank the authors who provided the content for the program, and to express our sincere gratitude to the program committee members and the reviewers who volunteered time and resources to make this program possible. We would also like to thank all the people that made this conference possible.

We hope that you will enjoy this program and that the symposium provides you with a valuable opportunity to share ideas with other researchers and practitioners.

**General chair:** Giancarlo Succi

**Program chairs:** Maurizio Morisio & Nachi Nagappan

**Proceeding chair:** Bruno Rossi

**Organizing chair:** Barbara Russo

many thanks to:

**sessions chairs, short papers and poster chairs**

**students volunteers:**

Alireza Rezaei Mahdiraji, Andrej Gavrilo, Ilenia Fronza, Maximilian Steff, Nabil El Ioini, Nattakarn Phaphoom, Josef Hardi, Topan Rosulla Berliana, Baig Mirza Asher, Bajwa Abid minir Bajwa
ESEM conference venue

first floor

lunch, FORST restaurant, via Goethe, 6

Arrivederci a Bolzano – Auf wiedersehen in Bozen