Gran Sasso Science Institute

GSSI is an international PhD school and a research center for advanced studies, see more details here: http://www.gssi.infn.it

I am involved in the research area for Computer Science

More details here: http://cs.gssi.infn.it/catia.t rubiani
## Research interests

<table>
<thead>
<tr>
<th>Area</th>
<th>Description</th>
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<tbody>
<tr>
<td>SPE: Software Performance Engineering</td>
<td>just happened during my PhD studies ;)</td>
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<tr>
<td>QFM: Quantitative Formal Methods</td>
<td>teaching a course at my current Institution 😊</td>
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<tr>
<td>SA: Software Architectures</td>
<td>received a best paper award in ECSA 2015</td>
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<tr>
<td>ML: Machine Learning</td>
<td>just for fun, a lot of work and no results yet 😞</td>
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DevOps World – some buzzwords


B1: Antipatterns

B2: Awareness

B3: Traceability

B4: Adaptation
B1: Performance Antipatterns

[TR-DevOps-2015]: “...better understand and formalize the relationship between symptoms, indicators, and root-causes connected to performance antipatterns...”

Key Question:

What does it mean to use performance antipatterns in the DevOps world?
Challenges for Performance Antipatterns

- Formalization -> a logic-based formalization [SoSyM 2014] but how can we specify antipatterns to reflect **DevOps concepts**?!

- Ranking of detected antipatterns -> a priority-based strategy [JSS 2014] but how can we rank antipatterns to reflect **DevOps priorities**?!


B2: Performance Awareness

[TR-DevOps-2015]: “Insights ... of developers should be collected and exchanged with Ops... performance awareness by developers needs to be evaluated more extensive and improved”

Key Question:
What are the most common uncertainties in the DevOps world?
Challenges for Performance Awareness

- Identification of uncertain parameters -> Monte-Carlo based sampling approach [QoSA 2013] but is it efficient to sample **Dev** parameters and what’s the impact on **Ops** results?!

- Providing best and worst values for software/hardware elements -> sensitivity analysis [QoSA 2014] but is it helpful for **DevOps** variabilities?!


[QoSA 2014] L. Etxeberria, C. Trubiani, V. Cortellessa, G. Sagardui: ”Performance-based selection of software and hardware features under parameter uncertainty”
B3: Performance Traceability

[TR-DevOps-2015]: “Current performance modeling formalisms barely ensure the traceability between the running system and model instances. With reference to DevOps, more traceability information should be stored within the models”

Key Question:
What is the traceability information needed to enable SPE in the DevOps world?
Challenges for Performance Traceability

- Identification of traceability links -> tool to specify traceability [ECSA 2015] but what is the traceability between Dev elements and Ops results?!

B4: Performance Adaptation

[TR-DevOps-2015]: “it needs to be emphasized that EA architectures need to be specifically designed to handle dynamically (de-)allocated resources during runtime”

Key Question:
What does it mean to perform self-adaption of software systems in the DevOps world?
Challenges for Performance Adaptation

- System configuration fulfilling performance requirements at run-time -> symbolic approach based on QN [SEAMS 2016] but what are the most suitable adaptations in the DevOps world?

Expectations from the seminar

My proposal is to discuss the following key topics on Performance:

- Antipatterns
- Awareness
- Traceability
- Adaptation

...anything else missing?!
Announcements:

**International Conference on Performance Engineering (ICPE),**

Propose a new **Workshop** - deadline: November 5, 2016