Towards Flexible Automated Support to Improve the Quality of Computational Science and Engineering Software

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Agenda

- Introduction
- Aim
- Current challenges
- Overview of the proposed solution
- Principles of the proposed solution
Introduction

- Continual evolution of the available hardware (e.g. in terms of increasing size, architecture, and computing power) and software (e.g. reusable libraries) is the norm rather than exception.

- These evolutions should be opportunities rather than sources of software engineering problems.
Aim

• Sketch a **flexible automated solution** supporting scientists and engineers in developing **accurate and reliable** CSE applications.

• Our **goal** is to enable CSE developers to spend more of their time **finding scientific results** rather than fixing maintenance problems.
Current Challenges

• Difficult V&V.

• Education.

• Tradeoff between medium and long term goals.

• Software engineering Best Practices (BP) are not adequately tailored.
Overview of the proposed solution

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Principles of the proposed solution

• **Automation** in metrics collection, storage, and data-mining allows us to easily formalize and transfer SE knowledge to developers.

• **Flexibility** to avoid the strict enforcement of any rules which would make the developers reject the tool in practice.

• **Iteration** for facilitating the transition towards the application of well-established BPs and enabling customization.
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