

WISE3 the Third International Workshop on Intelligent Software Engineering - Open issues, new techniques, challenge problems in software engineering

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What is it all about? Are we WISE participants more intelligent than other ICSE attendees? Hardly! But we share the common objective to develop and adopt concepts and techniques to make current software engineering tools more powerful and cost effective by exploiting intelligent techniques. Typically, such techniques have their roots in the area of knowledge-based systems and artificial intelligence (AI).

So, how mature is this kind of technology? What are the benefits and issues involved? Well, we covered twelve different approaches targeted to various problem areas in Software Engineering, including:

- requirements engineering,
- software specification and
- evolution,
- optimization,
- debugging,
- testing,
- program comprehension,
- reengineering,
- maintenance, and
- reuse.

Initially, the authors of this report had some doubts that this variety of application domains would provide us with a sufficient basis for fruitful discussions. We were wrong. In fact, we experienced a lot of analogies and synergies among the different areas. During the first part of the workshop, we identified three predominant threads, namely:

The problem of evolving software specifications, software comprehension and maintenance, and development and evolution of knowledge bases.

In a breakout discussion over lunch, we tried to identify major challenge problems related to these threads:

1. In the area of evolving software specifications, we recognized the challenge of performing automatic changes to low-level specifications (implementations) based on modifications of abstract (high-level) specifications. At this, we noticed many similarities of this problem with the problem of automatic code transformations in accordance to architectural redesign transformations in software reengineering.
2. The group that was supposed to discuss issues in software comprehension and maintenance had a vivid discussion on how much flexibility is needed to customize the process and knowledge implemented in tools to achieve an effective and efficient tool-user partnership. Apparently, the question of whether or not to provide high-level formalisms to customize such tools is a trade-off between flexibility and run-time efficiency, respectively ease of use.
3. Finally, in the area of development and evolution of knowledge bases, a central issue appears to be the integration of different types of knowledge.

Despite controversial discussion on various topics, all participants acknowledged the need for making the transition from academic, small-sized application examples to real-life, industrial-strength case studies to provide convincing evidence about the benefits of the presented approaches. Therefore, we would like to encourage you to visit the workshops web site at <http://www.tim.menzies.com/wise3> and contact the organizers if you can contribute a practical application example.

Another central challenge that has been mentioned repeatedly during this years ICSE is the question how to handle inconsistency that is an inherent characteristic of many software engineering activities. Recently, researchers have begun to exploit techniques developed in the domain of AI and Soft Computing (e.g., fuzzy reasoning) to address this problem. Among others, this will be a central theme of the upcoming 2nd Intl. Workshop on Soft Computing applied to Software Engineering (SCASE-01). The call for participation will be published at <http://varlet.uvic.ca/~scase01>