Invited talk (ModComp)

A Little Look Outside of the Box

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For those who see science as a comfort zone, the natural instinct is to continue addressing the challenges they excel at or simply enjoy, embracing familiar user needs, and advancing vertically, that is, devising incremental solutions that build on increasingly numerous implicit (and frequently silent) assumptions. That conduct may be gratifying in more than one way, but it fails to respond to the mounting wave of needs that the massive digitalization of the fabric of the world we live in is bringing about. Put in another way, the quantity of software being produced and deployed nowadays in the most disparate of infrastructures and applications, much beyond the usual software-intensive domains, is unprecedented, but the adoption of advanced methods and tools for them is miserably low. The production urge is so massive that the throughput of informatics education worldwide comes short by a factor of a tenfold or more. Not surprisingly therefore, the population of programmers is largely unaware of advanced development methods, including MDE and CBSE, compounded with the fact that their coverage in most academic curricula is modest, at best. The pressure of short-term productivity, for apps, services, or utilities alike, all equally oblivious to long-livedness requirements, leave little room for attending to quality concerns other than the most superficial ones. Indeed, we should marvel at all we can do with software on an amazing variety of computing platforms. And yet, we should feel the urge for software to be better: more robust, more composable, more energy- and resource-friendly, and more maintainable. There are multiple ways for this community to respond to this situation. This talk will highlight just a few of them, with the background intent of a call-to-action. One such way is to gain a better understanding of the emerging scenarios, which other authors have dubbed "an uncertain world", where the computational environment no longer is (if it ever was) predictable and fully specifiable, and the computing systems cannot be expected to be trouble-free. Another is to shift focus on much semantically enhanced interface contracts – a central theme of CBSE – to assist reasoning about increasingly heterogeneous interconnected software parts but also to enable learning from run time (a vital feature for autonomous systems). A final one, for this talk, is to consider social hype and visibility to devise use cases that can make impact and raise much better the awareness in practice and in education than our customary preaching to the converted.

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and a PhD from the Technical University of Delft, Netherlands (1998). After working as PI in a software consultancy firm in Pisa, Italy, from 1997 until mid-1991, he was with the European Space Research and Technology Center in the Netherlands for a decade, until the end of 2001, investigating methods, tools and runtimes for the development and execution of on-board software. At the University of Padua, he does a lot of teaching and researching in the areas of high-integrity real-time systems, quality of service under real-time constraints and software engineering methods, including model-driven engineering and component-based development, and related processes, and lately Cloud and Edge computing. He has run numerous research projects in the areas of his research interests on funding from international and national organizations. He has been a member of IEEE for the last 20+ years. He is the Italian representative in technical expert groups of ISO/IEC JTC1/SC22: WG9 (Ada) and WG23 (Programming Language Vulnerabilities). Since 2004, he is president of Ada-Europe, a Europe-based not-for-profit organization that promotes the use and the knowledge of Ada in academic and research establishments.