Croatian Science Foundation

HRZZ Installation Research Projects

Evolving Software Systems: Analysis and Innovative Approaches for Smart Management
EVOSOFT

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Name of the PI's host institution for the project: **Faculty of Engineering, University of Rijeka**
Project proposal full title: **Evolving Software Systems: Analysis and Innovative Approaches for Smart Management**
Project proposal duration in months: **36 months**

Project proposal summary
Evolving complex software systems (EVOSOFT) have become a central part of a rapidly growing range of applications, products and services supporting daily human activities from all economic sectors. As they are often distributed, heterogeneous, decentralized and inter-dependent, and operating in dynamic and unpredictable environments, availability and reliability become key properties for its operation and future evolution. The novel and still unexplored area of research addressed in this project is to understand how abstract software structures and local system properties influence fault distributions, thus affecting mission critical system properties, among which availability and reliability and to develop innovative approaches for smart management of their operation and evolution. We are facing with completely new phenomena, similar to human evolution, but produced by human intellect. Foundations and theories from other disciplines aiming to understand complex system behavior, evolution and human reasoning could be applied. New findings would open new opportunities in many scientific fields, especially in complex systems theory and its applications, thus interacting with a wide spectrum of sciences, from natural sciences such as biomedicine to social sciences. Industrial experience gathered by systematic Empirical Software Engineering approach is extremely important for further evolution of software engineering discipline. New theories cannot provide effective means for industry without fundamental understanding of EVOSOFT behavior. The main aim of this project is to fulfill this gap between empirical evidence and theoretical models. In that aim we combined empirical and theoretical skills aiming to:

- replicate studies and confirm empirical principles and methods and define a solid base to ground new theories,
- define structural dependencies for applicability of empirical principles, methods,
- define formal models and innovative approaches for smart management

Team members:
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