



AgileGroup



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The Agile Group is a research group working on software engineering, and modeling and simulation techniques at the University of Cagliari, Sardinia, Italy.

It has been one of the first research teams in the world working on agile methodologies for software development, and organized the first world conference on Extreme Programming and Agile Methodologies in Software Engineering - XP2000, in Cagliari, on May 2000.

Next year, it will organize the 15th International Conference on Agile Software Development - XP 2014, in Rome, 26-30 May, 2014 (www.xp2014.org).

The Agile Group participates to several research projects, funded by E.U., Italian Government, Sardinia Region and private firms. The budget of these projects has been consistently above 400,000€ per year in the past years.

Specific expertise in European Union Research Programs:

- U.E. Coordination Action No: 015981 (6th FP) TOSSAD: "Towards open source software adoption and dissemination", €800,000.00 total, with 20 partners, coordinated by TUBITAK – UEKAE, Ankara, Turkey.
- U.E. STREP Under FP6-2003-NEST-PATH-1 No: 516446, "Financial Markets and Complexity: Uncertainty, Heterogeneous Micro Agents and Aggregate Outcomes", € 1.5 million total, in cooperation with the Universities of Warwick (coordinator), Marseilles, Amsterdam, Kiel, and Int. Center for Theoretical Physics of Trieste. Cagliari budget: € 173.340.
- U.E. STREP Under FP6 1ST FET PROACTIVE INITIATIVE "SIMULATING EMERGENT PROPERTIES IN COMPLEX SYSTEMS" No: 035086, EURACE "An agent-based software platform for European economic policy design with heterogeneous interacting agents: new insights from a bottom up approach to economic modeling and simulation", € 2.2 million total, in cooperation with the Universities of Genoa (coordinator), Ancona, de la Méditerranée (Nice and Aix en Provence), Bielefeld, Sheffield, and with TUBITAK, National Research Institute of Electronics and Cryptology (Istanbul) and the Council for the Central Laboratory of the Research Councils (Oxford). Cagliari budget: € 255.000.

The Agile Group generated two spinoff companies, FlossLab Ltd, and Experteam Ltd, which operate in the field of software development and consultancy (www.flosslab.com, www.e-xperteam.com).

Main Fields of Competence:

Software Engineering and Agile Methodologies

Agile and Lean-Kanban methodologies for software development. Estimation of the software development effort. Software process and product metrics. Use of complexity and random graph theory for defining software metrics. Mining of large software repositories. Bug propagation analysis. Tools for software process support. Web services and Web applications. Quality certification for software systems.

Open Source Software

Software Engineering of open source software (OSS). OSS communities as social networks. Methodologies for assessing open source solutions. Cost-benefits analysis of OSS. Migration processes to OSS in firms and public bodies. Development of software systems based on OSS components (Linux, Apache, Open Office, CVS, Postgres, MySQL, etc.).

Object-Oriented Technologies

UML, OO analysis and design. OO Languages: Java, C#, C++, Smalltalk, Ruby. Automated testing of OO systems.

Modeling and Simulation of Systems

Discrete event modeling of systems. Modeling and simulation of the software development process and of business processes in general. Railways traffic simulation. Heterogeneous agent modeling of economic and financial systems.

Computational Economics and Finance

Artificial stock markets. Artificial energy markets. Optimal portfolio management. Risk management. Modeling and simulation of complex economic systems. Models of environmental impact and resource depletion impact on social and economic systems.

E-government:

Software distributed architectures for cooperating applications. Interoperability standards. Project management techniques for public bodies. System and services integration. Open Source for Public Bodies.

Semantic Web and ontologies:

Taxonomies. Management and categorization of User-Generated Content from different sources. Ontologies for multimedia content semantics. Optimization of knowledge availability in institutional repositories. Knowledge formalization and management in KMS.

Selected publications:

- Lux T., Marchesi M. (1999). Scaling and Criticality in a stochastic multi-agent model of a financial market. *NATURE*, vol. 397; p. 498-500.
- Succi G., Marchesi M. (2002). *EXTREME PROGRAMMING EXAMINED*, Addison-Wesley, New York.
- Focardi S., Cincotti S., Marchesi M. (2002). Self-organization and market crashes. *J. ECONOMIC BEHAVIOR & ORGANIZATION*, vol. 49; p. 241-267.
- Armano G, Marchesi M., Murru A (2005). A Hybrid Genetic-Neural Architecture for Stock Indexes Forecasting. *INFORMATION SCIENCES*, vol. 170; p. 3-33.
- Concas G., Locci M., Marchesi M., Pinna S, Turnu I (2006). Fractal Dimension in Software Networks. *EUROPHYSICS LETT.*, vol. 76; p. 1221-1227.
- Melis M., Turnu I., Cau A., Concas G. (2006). Evaluating the Impact of Test-First Programming and Pair Programming through Software Process Simulation. *SOFTWARE PROCESS IMPROVEMENT AND PRACTICE*, vol. 11; p. 345-360.
- Concas G., Marchesi M., Pinna S., Serra N (2007). Power-Laws in a Large Object-Oriented Software System. *IEEE TRANS. SOFTWARE ENGINEERING*, vol. 33; p. 687-708.
- Mannaro K, Marchesi, M., Setzu, A (2008). Using an Artificial Financial Market for Assessing the Impact of Tobin-like Transaction Taxes. *JOURNAL OF ECONOMIC BEHAVIOR & ORGANIZATION*, vol. 67; p. 445-462.
- Ecca S, Marchesi M., Setzu A (2008). Modeling and Simulation of an Artificial Stock Option Market. *COMPUTATIONAL ECONOMICS*, vol. 32; p. 37-53.
- Concas G., Marchesi M., Murgia A, Tonelli R. Turnu I. (2010), On the Distribution of Bugs in the Eclipse System, *IEEE TRANSACTIONS ON SOFTWARE ENGINEERING*, vol. 37.
- Turnu I., Concas G., Marchesi M., Pinna S., Tonelli R. (2011). A Modified Yule Process to Model the Evolution of Some Object-Oriented System Properties, *INFORMATION SCIENCES*, (181), 883-902.
- Turnu I., Concas G., Marchesi M., Tonelli R. (2013). The fractal dimension of software networks as a global quality metric, *INFORMATION SCIENCES*, (245), 290-303.
- Concas G., Lunesu M.I., Marchesi M., Zhang H. (2013). Simulation of software maintenance process, with and without a work-in-process limit, *JOURNAL OF SOFTWARE: EVOLUTION AND PROCESS*, available online.

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