

8th International Workshop on Software Engineering for E-learning (ISELEAR'17)

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ABSTRACT

This paper introduces the TEEM 17 track for the 8th International Workshop on Software Engineering for E-Learning (ISELEAR'17). The ISELEAR workshop focuses on the systematic construction of E-Learning ecosystems by using appropriate methods, techniques and tools. Thus, and contrarily to other venues in E-Learning, which highlight the pedagogical dimension of the E-Learning ecosystems, ISELEAR highlights the development aspects of the software that supports these ecosystems. This introduction describes the workshop's mission, history, and review and selection process, and summarizes the papers accepted for the 2017 edition of the workshop.

CCS CONCEPTS

•Software and its engineering •Applied computing → Education →E-learning.

KEYWORDS

Software Engineering, E-Learning Engineering, Educational Technology.

1 THE ISELEAR WORKSHOP SERIES

E-Learning ecosystems can integrate a great variety of components, ranging from Learning Managements Systems (LMS) or digital repositories, to social networks, educational external tools, etc. In addition, the design of these ecosystems must be accomplished by multidisciplinary teams involving many different profiles (e.g., teachers, developers,

instructors), and should also be aware of the diversity of the final users (e.g., teachers, students or tutors) by taking into account their particular needs and user experience requirements. As a consequence, this heterogeneity exponentially increases the technological complexity of the resulting ecosystems.

In order to cope with the aforementioned intrinsic complexity, the design and development of an E-Learning system require new domain-specific methods, techniques and tools specializing existing software design and development methodologies (agile methodologies, model-driven techniques, domain engineering approaches, web application frameworks, methods and metrics for effort estimation, etc.) [7][8][22][23][25][28]. Therefore, a significant effort to define tools and methodologies specifically coined for E-Learning has been carried out by institutions, companies and educational tool developers in order to address aspects like production of learning contents by multidisciplinary groups, standardization of different aspects of E-Learning, application of E-Learning recommendations and standards, formative assessment approaches, etc. As a consequence, it is possible to identify a new emerging discipline, that of E-Learning Software Engineering, which has to do with all the aspects concerning the systematic conception, design, development and maintenance of E-Learning ecosystems.

However, typical E-Learning venues generally are focused on pedagogical and user-centred aspects of advanced technologies and educational systems, while aspects like project planning, life-cycle, modelling, design, etc. are barely addressed or treated as collateral aspects. The ISELEAR (International Workshop on Software Engineering for E-Learning) Workshop series are oriented to bridge this gap, focusing on all the Software Engineering aspects of the e-Learning application domain.

Some of the topics of interest traditionally highlighted by ISELEAR are:

- Software Requirements Engineering in E-Learning.
- Software architectures, modeling, specification, design and programming of E-Learning systems.
- Software technologies applied to the development of complex E-Learning systems.

- Management of multidisciplinary teams of instructors, domain experts, and developers in the production and maintenance of E-Learning systems, applications and content.
- Testing, verification and validation of software in E-Learning.
- Software Quality Assurance in E-Learning.
- Empirical methods in E-Learning Software Engineering.
- Model-Driven Software Engineering for E-Learning.
- Domain Analysis and Domain Engineering for E-Learning.
- Software Language Engineering and E-Learning.
- Metrics and estimation methods for Engineering Education.
- Development methods of E-Learning ecosystems.
- Evaluation of the usability of applications, systems and platforms, and user satisfaction in Engineering Education.
- Process models for Engineering Education.
- Standardization and normalization.
- Certification of Software Quality.
- Development of methodologies for Engineering Education.
- Practical experiences and lessons learned.

The ISELEAR Workshop series started at Valencia (Spain) in 2010, as a satellite workshop of the XV Conference on Software Engineering and Databases (JISBD 2010), which was organized in turn in the context of III Spanish Congress on Computer Science (CEDI 2010) [20]. In 2011 the workshop was held in the Complutense University of Madrid (Spain) as an independent event [19]. In 2012 the workshop was held in Andorra, and it was collocated with the XIV International Symposium on Computers in Education (SIIE 2012) [12]. In 2013 ISELEAR was organized as a track of TEEM (the International Conference Technological Ecosystems for Enhancing Multiculturality), held in Salamanca (Spain) [10][16]. ISELEAR'14 was organized as a track of SIIE 2014, celebrated in Logroño (Spain) [3][26]. Finally, both ISELEAR'15 [18], ISELEAR'16 [6] and the current edition ISELEAR'17, have been organized as tracks of, respectively, TEEM'15 (Porto, Portugal) [2], TEEM'16 (Salamanca) [9] and TEEM'17 (Cádiz). These workshops have also had several follow-ups such as revised and extended post-proceedings [4][13][21][27] and special issues in reputed journals [1][5][11][14][15][17][24].

2 ISELEAR 2017

As aforementioned, the 2017 Edition of ISELEAR has been organized as a track of TEEM'17. The ISELEAR'17 program

committee was formed by the following experts on different aspects of the E-Learning Software Engineering discipline:

- Ana Fernández-Pampillón (Complutense University of Madrid, Spain)
- Ángel Velázquez (University of Rey Juan Carlos, Spain)
- Antonio Mendes (University of Coimbra, Portugal)
- Camino Fernández (University of León, Spain)
- Carina González (University of La Laguna, Spain)
- Christos Bouras (University of Patras, Greece)
- Cristina Gomes (Polytechnic Institute of Viseu, Portugal)
- Francisco-José García-Peñalvo (University of Salamanca, Spain)
- Georgios Kambouralis (University of the Aegean, Greece)
- Ivan Lukovic (University of Novi Sad, Serbia)
- José-Ramón Hilerá-González (University of Alcalá, Spain)
- Juan-Manuel Dodero (University of Cadiz, Spain)
- Lilia Cheniti (University of Sousse, Tunisia)
- Maha Khemaja (University of Sousse, Tunisia)
- Manuel Caeiro Rodríguez (University of Vigo, Spain)
- Martín Llamas (University of Vigo, Spain)
- Miguel Rodríguez-Artacho (National Open University, Spain)
- Miguel-Angel Redondo (University of Castilla-La Mancha, Spain)
- Miguel-Angel Sicilia (University of Alcalá, Spain)
- Antonio Navarro (Complutense University of Madrid, Spain)
- María-Visitación Hurtado-Torres (University of Granada, Spain)
- Pilar Rodríguez (Autonomous University of Madrid, Spain)

In this edition it is remarkable the high quality of the submissions received. Indeed, after having been peer-reviewed by at least three members of the program committee, and applying the gold-standard of accepting only those submissions not receiving any negative review, we accepted 5 of 6 submissions received (about 17% of rejection rate).

3 THE ACCEPTED PAPERS

This section will give a brief presentation of the papers selected for ISELEAR'17.

The paper "Raising awareness of the accessibility challenges in mathematics MOOCs" by Alexa Ramírez-Vega, Francisco Iniesto and Covadonga Rodrigo proposes a method to assess the accessibility of math MOOCs and applies this method to several courses in popular MOOCs platforms. As the main result, several accessibility problems are identified in the materials.

The paper “Generic eLearning Environments and Intelligent Software Architectures for Complex Cooperation” by Ana M. González de Miguel proposes to organize the architecture of complex e-learning systems in terms of: (i) a hierarchical refinement of interconnected components modeling cooperative behavior, (ii) intelligent system architectures intertwined with this hierarchical organization. The paper describes the rationality and generalities of the organization, as well as the application to a case study.

The paper “Improving the OEEU’s data-driven technological ecosystem’s interoperability with GraphQL” by Andrea Vázquez Ingelmo, Juan Cruz-Benito and Francisco J. García-Peñalvo describes the architecture of a data-driven ecosystem based on a unique endpoint to serve data. This endpoint accepts queries in terms of the Graph-QL query language. As a consequence, client applications have a great flexibility to get the required data (without be limited by specific endpoints).

The paper “Detecting plagiarism in micro-blogging social networks” by Jorge J. Gómez-Sanz describes a plug-in allowing plagiarism detection in a micro-blogging system. This plug-in implements a naive, but fast, method to measure similarity among contributions.

Finally, the paper “Preliminary validation of the metamodel for developing learning ecosystems” by Alicia García-Holgado and Francisco José García Peñalvo proposes a metamodel for modelling e-learning ecosystems and a case-study of applying this metamodel for modelling a particular ecosystem (an ecosystem associated to instruction in Spanish public administration).

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