

**3rd International Symposium on Leveraging Applications of Formal Methods,
Verification and Validation (Isola 2008)**

Proposal for Track

*Processes, Methods and Tools for Developing Educational Modules
to Support Teaching and Technology Transfer*

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Several initiatives on using new computing technologies have been investigated in order to facilitate the learning process in general. The challenge is to provide ways to establish quality educational products, capable of motivating the students and effectively contribute to their knowledge construction process in active learning environments. Also, there is a need for a global education, capable of crossing international, cultural and social borders in order to prepare both students and practitioners for the global market.

Educational modules can be explored in this perspective. Basically, an educational module is a concise unit of study, composed by theoretical and practical content which can be delivered to learners by using technological and computational resources. For theoretical content, instructors use books, papers, web information, slides, class annotations, audio, video, and so on. Practical content is the instructional activities and associated evaluations, as well as their resulting artifacts (e.g., executable programs, experimental studies, collaborative discussions). Theoretical and practical content are integrated in terms of learning materials. Learning environments, presentation tools and mechanisms to capture classroom lectures and to support discussion spaces and collaborative work are examples of the required infrastructure for delivering the learning materials. Besides that, educational modules themselves should be evolvable, reusable and adaptable to different educational and training scenarios, according to the learner's profile, instructor's preferences, learning goals and course length, among others.

Similar to software products, educational modules require the establishment and integration of methods, tools and procedures into systematic processes aiming at producing quality products. None of the initiatives to address the problem of creating educational modules considers a systematic process for developing them. In short, the development of such modules can involve developers from different domains, working on multi-disciplinary and heterogeneous teams, geographically dispersed or not. They should cooperate, sharing data and information regarding the project. Furthermore, we should consider the adoption of supporting tools, which can be used either as part of the educational module under construction or as a mechanism to automate its development process.

This track aims at bring together researchers and practitioners in the establishment and use of systematic processes for creating and reusing well-designed, highly flexible and configurable educational modules, which would provide: (1) transferability to different institutions and learning environments; (2) effective support to traditional learning approaches; and (3) effective support to non-traditional environments, motivating the transition from lecture-based to active learning. The idea is to promote advance in the research and practice in the area by aiding the establishment of collaborations and joint projects.

In exploring this theme, we wish to encourage papers within the following topics of interest:

- Teaching processes and methodologies.
- Design of new courses and materials.
- Learning environments and tools.
- Studies of educational practices.
- Industry-academia collaboration models.
- Internet course delivery techniques.

The track would be 3 hours-long (half-day track), having 6 papers. Papers submitted for the track should report on original research, must contain at least 30% of new material compared to the conference/workshop paper, and should not be under consideration for publication by any other journal. The track organizers will be in charge of managing the review process of the papers submitted to the track.

Track Organizers – List of Recent Publications

Journals

1. CAGNIN, M. I. ; BRAGA, R. T. V. ; GERMANO, F. S. ; PENTEADO, R. D. ; MALDONADO, J. C. . A Version Control Tool for Framework-based Applications. CLEI Electronic Journal, v. 10, p. 7-13, 2007.
2. LEMOS, O. A. L. ; VINCENZI, A. M. R. ; MALDONADO, J. C. . Control and Data Flow Structural Testing Criteria for Aspect-Oriented Programs. Journal of Systems and Software, New York, v. 80, n. 6, p. 862-882, 2007.
3. CRESPO, A. N. ; JINO, M. ; PASQUINI, A. ; MALDONADO, J. C. . A binomial software reliability model based on coverage of structural testing criteria. Empirical Software Engineering, v. 10, p. 81-104, 2007.
4. VINCENZI, A. M. R. ; DELAMARO, M. E. ; MALDONADO, J. C. ; WONG, W. E. . Establishing structural testing criteria for Java bytecode. Software: Practice and Experience, v. 36, n. 14, p. 1513-1541, 2006.
5. MALDONADO, J. C. ; CARVER, J. ; SHULL, F. ; FABBRI, S. C. P. .F. ; DÓRIA, E. S. ; MARTIMIANO, L.A.F. ; MENDONÇA, M. G. ; BASILI, V. R. . Perspective-Based Reading: A Replicated Experiment Focused on Individual Reviewer Effectiveness. Empirical Software Engineering, v. 11, n. 1, p. 119-142, 2006.
6. VINCENZI, A. M. R. ; SIMÃO, A. S. ; DELAMARO, M. E. ; MALDONADO, J. C. . Muta-Pro: Towards the Definition of a Mutation Testing Process. Journal of the Brazilian Computer Society, v. 12, p. 47-61, 2006.
7. MALDONADO, J. C. ; CARVER, J. ; SHULL, F. ; FABBRI, S. C. P. .F. ; DÓRIA, E. S. ; MARTIMIANO, L. A. F. ; MENDONÇA NETO, M. G. ; BASILI, V. R. . Perspective-Based Reading: A Replicated Experiment Focused on Individual Reviewer Effectiveness. Empirical Software Engineering, v. 11, n. 1, p. 119-142, 2006.
8. VERGÍLIO, S. R. ; MALDONADO, J. C. ; JINO, M. ; SOARES, I. W. . Constraint Based Structural Testing Criteria. Journal of Systems and Software, v. 79, n. 6, p. 756-771, 2006.
9. VINCENZI, A. M. R. ; MALDONADO, J. C. ; WONG, E. ; DELAMARO, M. E. . Coverage Testing of Java Programs and Components. Journal Of Science Of Computer Programming, v. 1, p. 211-230, 2005.
10. WONG, E. W. ; SUGETA, T. ; QI, Y. ; MALDONADO, J. C. . Smart Debugging Software Architectural Design in SDL. Journal of Systems and Software, v. 76, p. 15-28, 2005.
11. VERGÍLIO, S. R. ; MALDONADO, J. C. ; JINO, M. . Experimental Results from Application of Fault-Sensitive Testing Strategies. Revista de Informática Teórica e Aplicada, v. 12, n. 1, p. 61-82, 2005.
12. SHULL, F. ; MENDONÇA NETO, M. G. ; BASILI, V. R. ; CARVER, J. ; MALDONADO, J. C. ; FABBRI, S. C. F. P. ; TRAVASSOS, G. H. ; OLIVEIRA, M. C. F. Knowledge-Sharing Issues in Experimental Software Engineering. Empirical Software Engineering An Empirical Journal, v. 9, n. 1, p. 111-137, 2004.
13. CHAIM, M. L. ; MALDONADO, J. C. ; JINO, M. . A Debugging Strategy Based on Requirements of Testing. Journal Of Software Maintenance And Evolution, v. 16, n. 4, p. 277-308, 2004.

Conferences

1. BARBOSA, E. F. ; SOUZA, Simone Do Rocio Senger de ; MALDONADO, José Carlos . An Experience on Applying Learning Mechanisms for Teaching Inspection and Software Testing. In: 21st Conference on Software Engineering Education and Training (CSEE&T 2008), 2008, Charleston (SC). To appear.
2. NAKAGAWA, E. Y. ; MALDONADO, J. C. . Requisitos Arquiteturais como Base para a Qualidade de Ambientes de Engenharia de Software. In: Iberoamerican Workshop on Requirements Engineering and Software Environments (IDEAS'2008), 2008, Recife. Proceedings IDEAS'2008, 2008.

3. FERRARI, Fabiano Cutigi ; MALDONADO, J. C. ; RASHID, Awais . Mutation Testing for Aspect-Oriented Programs. In: International Conference on Software Testing, Verification and Validation (ICST'2008), 2008, Lillehammer, Norway. Proceedings of the 1st International Conference on Software Testing, Verification and Validation (ICST'2008). Washington, DC - USA : IEEE Computer Society, 2008.
4. MALDONADO, J. C. ; NAKAGAWA, E. Y. ; SIMÃO, A. S. . Addressing Separation of Concerns in Software Engineering Environments. In: IASTED International Conference on Software Engineering, 2007, Innsbruck. Proceedings of IASTED International Conference on Software Engineering, 2007. p. 1-6.
5. PINHO, Viviane Malheiros de ; HÖHN, Erika Nina ; PINHO, Roberto. ; MENDONÇA NETO, M. G. ; MALDONADO, J. C. . A Visual Text Mining approach for Systematic Reviews. In: International Symposium on Empirical Software Engineering and Measurement (ESEM), 2007, Madrid. Proceedings of the 1st ACM/IEEE International Symposium on Empirical Software Engineering and Measurement, 2007. p. 245-254.
6. NAKAGAWA, E. Y. ; SIMÃO, A. S. ; FERRARI, Fabiano Cutigi ; MALDONADO, J. C. . Towards a Reference Architecture for Software Testing Tools. In: Nineteenth International Conference on Software Engineering and Knowledge Engineering SEKE'2007, 2007, Boston, USA. Proceedings of the Nineteenth International Conference on Software Engineering & Knowledge Engineering SEKE'2007, 2007. p. 157-162.
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8. SIMÃO, A. S. ; PETRENKO, Alexandre ; MALDONADO, J. C. . Experimental Evaluation of Coverage Criteria for FSM-based Testing. In: Simpósio Brasileiro de Engenharia de Software, 2007, João Pessoa, PB. Anais do XXI Simpósio Brasileiro de Engenharia de Software, 2007. p. 359-374.
9. BARBOSA, E. F. ; SOUZA, S. R. S. ; DOMINGUES, A. L. S. ; CHAN, Al. ; HÖHN, Erika Nina ; MALDONADO, J. C. . Uma Experiência no Ensino de Inspeção e Teste de Software. In: Simpósio Brasileiro de Qualidade de Software, 2007, Porto de Galinhas, PE. Anais do VI Simpósio Brasileiro de Qualidade de Software, 2007. p. 309-324.
10. CHAN, Al. ; CAGNIN, M. I. ; MALDONADO, J. C. ; BRAGA, R. T. V. . Uma proposta de ambiente para apoiar a utilização de padrões de software e requisitos de teste no desenvolvimento de aplicações. In: Conferência Latino-americana em Linguagens de Padrões para Programação, 2007, Porto de Galinhas, PE. Proceedings of SugarLoafPLoP 2007, 2007. p. 235-250.
11. GARCIA, Rogério Eduardo ; OLIVEIRA, M. C. F. ; MALDONADO, J. C. . ESEIn-virtuo: a tool for running In-virtuo Experimental Studies.. In: IV Experimental Software Engineering Latin American Workshop - ESELAW, 2007, São Paulo. Proceedings of IV Experimental Software Engineering Latin American Workshop, 2007. p. 51-56.
12. BONIFÁCIO, A. L. ; SIMÃO, A. S. ; MOURA, A. ; MALDONADO, J. C. . Conformance Testing by Model Checking Timed Extended Finite State Machines.. In: Simpósio Brasileiro de Métodos Formais, 2006, Natal. Simpósio Brasileiro de Métodos Formais, 2006. v. 1. p. 43-58.
13. DELAMARO, M. E. ; VINCENZI, A. M. R. ; MALDONADO, J. C. . A Strategy to Perform Coverage Testing of Mobile Applications. In: First Workshop on Automation of Software Test - AST'06, 2006, Shanghai. 28th International Conference on Software Engineering (ICSE'06). New York : ACM Press, 2006. v. 1. p. 118-124.
14. CORTE, C. K. D. ; BARBOSA, E. F. ; MALDONADO, J. C. . Estabelecimento de Mecanismos de Apoio ao Ensino Integrado de Fundamentos de Programação e Teste de Software. In: XIV Workshop sobre Educação em Computação, 2006. XIV Workshop sobre Educação em Computação. v. 1. p. 1-1.
15. NAKAGAWA, E. Y. ; CRUZ, N. F. ; MALDONADO, J. C. . Relevância dos Requisitos no Desenvolvimento de Software Livre. In: VII Workshop Software Livre, 2006, Porto Alegre. VII Fórum Internacional Software Livre, 2006. v. 1. p. 171-176.

16. BARBOSA, E. F. ; NAKAGAWA, E. Y. ; MALDONADO, J. C. . Towards the Establishment of an Ontology of Software Testing. In: Eighteenth International Conference on Software Engineering and Knowledge Engineering (SEKE'06), 2006, San Francisco. Eighteenth International Conference on Software Engineering and Knowledge Engineering (SEKE'06), 2006. v. 1. p. 522-525.
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18. BARBOSA, E. F. ; MALDONADO, J. C. . A Standard Process for Developing Educational Modules. In: 6th Annual Frontiers in Education Conference, 2006, San Diego. 6th Annual Frontiers in Education Conference, 2006. v. 1. p. 1-1.
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20. CAMARGO, V. V. ; HÖHN, E. N. ; MALDONADO, J. C. . Um estudo comparativo do tempo de composição de um framework orientado a aspectos de persistência e de um framework orientado a objetos de persistência. In: XX Simpósio Brasileiro de Engenharia de Software, 2006, Florianópolis. XX Simpósio Brasileiro de Engenharia de Software, 2006. v. 1. p. 193-208.
21. MALDONADO, J. C. ; FERRARI, F. C. . Uma Revisão Sistemática sobre Teste de Software Orientado a Aspectos. In: III Workshop Brasileiro de Desenvolvimento de Software Orientado a Aspectos (WASP'2006) - realizado em conjunto com o XX Simpósio Brasileiro de Engenharia de Software (SBES'2006), 2006, Florianópolis. III Workshop Brasileiro de Desenvolvimento de Software Orientado a Aspectos (WASP'2006), 2006. v. 1. p. 101-110.
22. GOMES, F. D. ; CAGNIN, M. I. ; MALDONADO, J. C. . Esboço de um Processo Ágil de Desenvolvimento baseado em Framework. In: XXXII Conferência Latino-Americana de Informática, 2006, Santiago. XXXII Conferência Latino-Americana de Informática, 2006. v. 1. p. 1-12.
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33. SUGETA, T. ; MALDONADO, J. C. ; WONG, W. E. . Mutation Testing Applied to Validate SDL Specifications. In: 16th IFIP International Conference on Testing of Communicating Systems, 2004, Oxford. Proceedings of the 16th IFIP International Conference on Testing of Communicating Systems, 2004. v. 2978. p. 193-208.
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