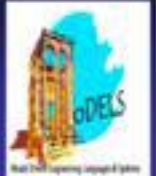# MoDELS / UML 2005

oDELS

unified modeling language

Conference Program

8th International Conference on
Model-Driven Engineering
Languages and Systems

October 2 – 7, Half Moon Resort, Montego Bay, Jamaica

MoDELS 2005 - Program at a Glance

	Sunday		Monday	Tuesday		Wednesday	Thursday	Friday	
8:00	**Registration** –St. Elizabeth								
8:30-9:00	**T1**-Westmoreland	**W4**-Cornwall III **W5**-Hanover **W7**-Heliconia **W9**-Hanover **W10**-Trelawny	**W2**-Cornwall III **W5**-Hanover **W6**-Trelawny **Educator's Symposium** Heliconia	**T5**-Westmoreland	**W1**- Cornwall III **W3**-Hanover **W8**-Trelawny **Doctoral Symposium**-Heliconia	**Welcome**-Hanover			
9:00-9:30						**D. Schmidt**: Model Driven Development for Real-time and Embedded Systems- Hanover	**J.-P. Tolvanen**: Model Driven Development-Hanover	**S13: Cross-cutting concerns**-Hanover **S14: Modeling Strategies**-Trelawny	**Panel 3: Building Better Systems**-Heliconia
9:30-10:00									
10:00-10:30	**Coffee Break**- Cornwall I – poster sessions on Wednesday								
10:30-11:00	**T1**-Westmoreland	**W4**-Cornwall III **W7**-Heliconia **W9**-Hanover **W10**-Trelawny	**W2**-Cornwall III **W5**- Hanover **W6**- Trelawny **Educator's Symposium** - Heliconia	**T5**-Westmoreland	**W1**- Cornwall III **W3**- Hanover **W8**- Trelawny **Doctoral Symposium**-Heliconia	**S1: Process**-Hanover **S2: Product families, reuse**-Trelawny **S3: State/behavior modeling**-Heliconia	**S7: Model Refactoring**-Hanover **S8: Quality Control**-Trelawny **S9: MDA**-Heliconia	**Coffee Break**- Cornwall I	
11:00-12:00								**S15: MDA II**-Hanover **S16: Automation II**-Trelawny **S17: Modeling Strategies II**-Heliconia	
12:00-12:30						**Lunch**-Cornwall II & III			
12:30-2:00	**Lunch** - on your own							**Lunch** - on your own	
2:00-2:30		**W4**-Cornwall III **W7**-Heliconia **W9**-Hanover **W10**-Trelawny	**W2**-Cornwall III **W5**- Hanover **W6**- Trelawny **Educator's Symposium** - Heliconia	**T6**-Westmoreland	**W1**- Cornwall III **W3**- Hanover **W8**- Trelawny **Doctoral Symposium**-Heliconia	**S4: Aspects**-Hanover **S5: Design Strategies**-Trelawny **S6: Model Transforms**-Heliconia	**S10: Automation**-Hanover **S11: UML 2.0**-Trelawny **S12: Industrial Experience**-Heliconia	**Closing, MoDELS 2006**-Hanover	
2:30-3:30									
3:30-4:00	**Coffee Break**- Cornwall I – poster sessions on Wednesday								
4:00-5:00		**W4**-Cornwall III **W7**-Heliconia **W9**-Hanover **W10**-Trelawny	**W2**-Cornwall III **W5**- Hanover **W6**- Trelawny **Educator's Symposium** - Heliconia	**T6**-Westmoreland	**W1**- Cornwall III **W3**- Hanover **W8**- Trelawny **Doctoral Symposium**-Heliconia	**Panel 1: MDA**-Hanover	**Panel 2: DSL vs UML Profiles**-Hanover		
5:00-6:00									
6:30/7:00			**Tutorial/ Workshop Reception**-Oleander Terrace (6:30-7:30)			**Conference Reception**-Royal Pavilion (6:30-8:00)	**Conference Banquet**-Sugar Mill (7:00-10:00)		

Legend: Ti: Tutorial *i*
       Wi: Workshop *i*
       Si: Technical Session *i*

Please note that lunch is only provided on Wednesday and Thursday. From Sunday through Thursday there will be two Coffee Breaks; on Friday there will only be one Coffee Break.
A Cyber Lounge will be available in the Manchester Room from Sunday through Thursday.

Front cover photograph: "A view of the Bay at Ocho Rios, St Ann, Jamaica" by Richard Anthony DeLisser

Welcome to MoDELS/UML 2005!

The entire conference committee and I would like to welcome you to the MoDELS/UML 2005 conference. This year we have expanded the scope of the conference. We hope that you will find the new topics exciting and thought-provoking. We hope that you have a productive time at the conference, and that you enjoy the venue and social events we have planned. Some of the highlights this year include:

- An Educator's Symposium to provide a forum for educators and trainers to meet and discuss their ideas and experience teaching modeling techniques and model-driven development

- A Doctoral Symposium to provide mentoring and guidance regarding dissertation research and beginning a research career, as well as an international forum for interacting with other students and faculty

- Scientific and Experience papers included in the program; scientific research papers that describe innovative research, and experience papers that focus on reporting project experience with model-driven development. All papers have undergone a rigorous review process by the program committee.

- Posters and Exhibits that demonstrate on-going research and application of that research

- The Best Paper Award, sponsored by Springer; the conference program includes 46 scientific and experience papers. Of these, the difficult task of choosing the best paper fell to the Program Chair. Thank you to all who submitted papers, and to the Program Committee who spent many hours reviewing them.

In particular, we would like to thank our corporate donors Microsoft Corporation for their generous contribution to the conference, including the conference bags and banquet, Microsoft Jamaica for the banquet entertainment, IBM for their support of the Doctoral Symposium, Digicel Jamaica for their contribution of the conference network in the Cyber Lounge, Springer for their sponsorship of the Best Paper Award, and Air Jamaica for discounted air fare to the conference. We would also like to thank our academic sponsors the University of Technology, Jamaica for printing the final program and tutorial booklets, the University of North Dakota for conference flyer printing and shipping, and Colorado State University for their administrative support.

Geri Georg, conference co-chair,
on behalf of the MoDELS 2005 conference committee

Organization

Conference Organization

General Chair: Stuart Kent, Microsoft, UK
Conference Co-Chairs: Geri Georg, Colorado State University, USA
                            Ezra Mugisa, The University of the West Indies at Mona, Jamaica
Treasurer and Registration Chair: Robert France, Colorado State University, USA
Program Chair: Lionel Briand, Carleton University, Canada
Experience/Industry Track Chair: Clay Williams, IBM Watson Research Center, USA
Workshop Chair: Jean-Michel Bruel, University of Pau, France
Tutorials Chair: Gianna Reggio, University of Genoa, Italy
Panel Chair: Siobhán Clarke, Trinity College, Ireland
Doctoral Symposium Chair: Jeff Gray, University of Alabama at Birmingham, USA
Tool Exhibition Chair: Gunjan Mansingh, University of the West Indies at Mona, Jamaica
Poster Chair: Felix Akinladejo, University of Technology, Jamaica
Local Arrangements Chair: Charmaine DeLisser, University of Technology, Jamaica
Publicity Chairs: Joao Araujo, New University of Lisbon, Portugal
                   Emanuel Grant, University of North Dakota, USA
Web Chair: Sudipto Ghosh, Colorado State University, USA

Introduction

MoDELS 2005 is the eighth international conference on Model Driven Engineering Languages and Systems. It replaces the UML series of conferences which began in 1999. The new MoDELS series of conferences are devoted to the topic of model-driven engineering, covering both languages and systems used to create complex systems. Model-driven system development has long been used in the development of complex hardware systems, and is becoming more prevalent in complex software and combined hardware and software systems development. Methodologies and tools are becoming available that can manipulate software models from very abstract concepts through refinement and testing. The MoDELS series of conferences is the premier venue for the exchange of innovative technical ideas and experiences relating to model-driven approaches in the development of software-based systems. This year MoDELS is being held in Montego Bay, Jamaica. The main conference is Wednesday, October 5 – Friday October 7. The main conference includes keynote talks, scientific and experience technical paper sessions, and panels. Tutorials and workshops are being held Sunday October 2 – Tuesday October 4. Poster and tool exhibits are accessible during the entire period of the conference.

Program Highlights

Keynote speakers. MoDELS 2005 welcomes two outstanding plenary speakers:

Douglas Schmidt, Vanderbilt University, USA: *Model Driven Development for Distributed Real-time and Embedded Systems*

Juha-Pekka Tolvanen, MetaCase, Finland: *Domain-Specific Modeling: No one size fits all*

The **technical program** includes 46 papers reporting on a full range of model-driven engineering languages and systems topics, including methodology, transformations and refactoring, aspects, quality control, automation, and industrial experience.

Workshops are on Sunday, Monday, and Tuesday, and provide a forum for groups of researchers and practioners to interact and advance their areas of interest. For the first time, MoDELS is sponsoring an Educator's Symposium to share information and experience in the area of teaching modeling topics. The MoDELS organization committee is proud to continue the Doctoral Symposium in 2005. This symposium enhances interaction and mentoring between PhD students working on topics relevant to the conference, and researchers in the field.

Tutorials are also offered this year, on Sunday and Tuesday. Tutorials are offered on a wide range of topics of interest to the attendees of MoDELS 2005, and are offered as half-day sessions.

Three **panels** are included in the main conference on Wednesday, Thursday, and Friday. Their purpose is to provide stimulating discussion of topics relevant to model-driven engineering languages and systems. The panels are:

- Panel 1, Wednesday, October 5

    What would be the ideal meta-modeling infrastructure? (Chair: Pierre-Alain Muller)
        Abstract: The goal of this panel is to discuss the requirements for an ideal meta-modeling architecture. The panel will address the following points:
        What is the scope of meta-modeling?
        How to reconcile domain-oriented meta-hierarchies with language-oriented meta-hierarchies?
        What would be a minimal core meta-language?
        What kind of tool support should be available for meta-modeling?

- Panel 2, Thursday, October 6

    A DSL or UML Profile. Which would you use? (Chair: Stuart Kent)
        Abstract: In implementing model driven approaches to software development, there is some debate about the languages to use for modelling. On one side, there is the UML, advocates of which might argue that it has everything you'll need and its profiling mechanisms are quite adequate to cope with any customization or specialization you might need. On the other side are those advocating domain specific languages, who might argue that most of the time you're going to need to specialize and customize the language you use for modelling, that UML is not a good starting point for such specialization, and UML profiles are weak mechanism for extensibility anyway. Let's instead put together technology appropriate for building DSLs,

they'd say. Of course, within the DSL camp, there's further debate about what is the right technology, but perhaps that's the topic of another panel... we'll see.

- Panel 3, Friday, October 7
  Building Better Systems: Modeling, Verification, and Testing (Chair: Clay Williams)
  Abstract: A stated goal of model-based software development is that software quality will drastically improve as a result of the use of modeling methods. This hope has been held out repeatedly in the past by other software development movements, including formal methods, computer aided software engineering (CASE), and various process movements, such as the Cleanroom approach to building software. The participants in this panel will explore whether we are reasonable in hoping that modeling as we know it today will significantly assist with quality issues. In doing so, they will discuss what the major technical issues are that need to be addressed in order to achieve higher quality software, and propose a research agenda for addressing these issues. The panelists will pay particular attention to the use of modeling languages to facilitate better testing, as well as how modeling languages can be used as a basis for verification approaches such as model checking and theorem proving.

The **posters** will be available throughout the main conference. Posters are especially useful to present and discuss new work that may not be mature enough for a paper. Poster authors will be available during the coffee breaks on Wednesday to discuss their work. The accepted posters are:
- "A Tool-Chain for Model-based User-Interface Design", Kizito S. Mukasa, Alexander Beodcher, Daniel Goerlich, and Detlef Zuehlke
- "MSTD: Middleware Transparent Software Development", Devon M. Simmonds, Robert B. France, and Sudipto Ghosh
- "Ontology-Based Model Transformation", Stephan Roser and Bernhard Bauer
- "A Formal Approach to Incorporating Access Control Features into Applications", Eunjee Song, Robert France, and Indrakshi Ray
- "Run-Time Round-Trip Engineering with Self", Ellen Van Paesschen and Maja D'Hondt
- "Families of Reflective Middleware Systems: the new generation", Nelly Bencomo, Gordon Blair, Geoff Coulson, and Paul Grace
- "Database Diagrams with OCL", Calin Adrian Comes and Nicolae Ghisoiu

The **tool exhibits** provide an opportunity for conference attendees to analyze and view the most relevant tools in the area of model-driven engineering languages and systems. Tools will be available for viewing during the main conference.
- "MetaEdit+", Metacase
- "IBM's Rational Software Architect", IBM and Intelligroup Caribbean, IBM's Rational Software Architect is an integrated design and development tool that leverages model-driven development with the UML for creating well-architected applications and services.

MoDELS 2005 Technical Program

Registration will be available each morning starting at 8:00 in the St. Elizabeth room.
Coffee breaks will be available **Sunday**, **Monday**, **Tuesday**, from 10:00 – 10:30 and 3:30 – 4:00 in the Trelawny/Hanover Foyer, Cornwall III, and Heliconia rooms.
Coffee breaks will be available **Wednesday** and **Thursday** from 10:00 – 10:30 and 3:30 – 4:00 in the Cornwall I room.
A **coffee break** will be available **Friday** from 10:30 – 11:00 in the Cornwall I room.
Lunch will be provided on **Wednesday** and **Thursday** from 12:30 – 2:00 in the Cornwall II and III rooms.
A **Cyber Lounge**, provided by Digicel Jamaica is available in the Manchester room.

Sunday, October 2

8:30 – 12:30

Cornwall III Room:

Workshop 4 Aspect Oriented Modeling - http://dawis.informatik.uni-essen.de/events/AOM_MODELS2005/
Organizers:

    Omar Aldawud, Lucent Technologies, USA
    Tzilla Elrad, Illinois Institute of Technology, USA
    Jeff Gray, University of Alabama at Birmingham, USA
    Mohamed Kandé, Condris Technologies, Switzerland
    Jörg Kienzle, McGill University, Canada
    Dominik Stein, University of Duisburg-Essen, Germany

Abstract: Aspect-orientation is a rapidly advancing technology. New and powerful aspect-oriented programming techniques are presented at the International Conference on Aspect-Oriented Software Development every year. However, it is not clear what features of such techniques are "common aspect-oriented concepts" and what features are rather language-specific specialties. Research in Aspect-Oriented Modeling (AOM) has the potential to help find such common characteristics from a perspective that is at a more abstract level (i.e., programming language-independent). The ultimate goal of research in AOM is to provide aspect-oriented software developers with general means to express aspects and their crosscutting relationships onto other software artifacts. This workshop aims to identify and discuss the impacts of aspect-oriented technologies on software modeling, and to set up a shared agenda for future research in aspect-oriented modeling of software systems.

Heliconia Room:

Workshop 7 Model Driven Development of Advanced User Interfaces - http://www.edm.uhasselt.be/mddaui2005/
Organizers:

    Jan Van den Bergh, Hasselt University, Belgium
    Heinrich Hussmann, University of Munich, Germany
    Andreas Pleuss, University of Munich, Germany
    Stefan Sauer, University of Paderborn, Germany

Abstract: The user interface of an application is often one of the core factors determining its success. While model-driven development is gaining popularity in the software engineering community, model-based user interface development is an important line of research in the human-computer interaction community. Both approaches make extensive use of models to develop software, but currently they are still vastly independent. This workshop aims at integrating the knowledge from both domains, leading to a model-driven development of user interfaces. In particular the focus lies on advanced user interfaces corresponding to the current state-of-the-art in human-computer interaction, such as interfaces supporting complex interactions, visualizations, multimedia representations, multimodality, adaptability, or customization.

Hanover Room:

Workshop 9 MDD for Software Product-lines: Fact or Fiction? -
http://www.geocities.com/andreynech/MDDandProductLinesWorkshop.html
Organizers:
    Douglas C. Schmidt, Vanderbilt University, USA
    Andrey Nechypurenko, Siemens
    Egon Wuchner, Siemens

Abstract: key advantages of using model-driven development in conjunction with commonalityvariability analysis (CVA) are (1) rigorously capturing the key roles and responsibilities in a CVA and (2) helping automate repetitive tasks that must be accomplished for each product instance. Often, however, new customer requirements invalidate the results of earlier CVAs, such that a CVA and its derived meta-models, DSMLs, and generators must be modified invasively and intrusively to reflect these new requirements. The primary scope of this workshop will be on theory and methods to reduce the impact of the new unanticipated requiremetns on the (meta)models and model interpretes in order to improve the usability of model-based technologies in real-life large scale applications.

Trelawny Room:

Workshop 10 Use Cases in Model-Driven Software Engineering - http://www.ie.inf.uc3m.es/wuscam-05/index.htm
Organizers:
    Hernán Astudillo, Universidad Técnica Federico Santa María, Valparaíso, Chile
    Gonzalo Génova, Universidad Carlos III de Madrid, Spain
    Michal Smialek, Warsaw University of Technology, Poland
    Juan Llorens, Universidad Carlos III de Madrid, Spain
    Pierre Metz, Darmstadt University of Applied Sciences, Germany
    Rubén Prieto-Díaz, James Madison University, USA

Abstract: The integration of use cases within Model Driven Software Engineering requires a better definition of use case contents, in particular use case description of behavior through sequences of action steps, use case pre- and post-conditions, and relationship between use case model and conceptual model. The UML2 specification allows for several textual and graphical representations of use case behavior, but does not provide any rules for transformations between different representations at the same level of abstraction. It does not provide either any rules for transformations of these representations to other artifacts at levels closer to implementation. With this workshop we hope to show how the resourceful application of use case models help to fill the "requirements gap" in the current resrach and practice of model-driven methodologies.

Westmoreland Room:

Tutorial 1 Model Driven Development with Eclipse Modeling Framework (EMF)
    Presenters:
    Vladimir Bacvanski, InferData, USA
    Petter Graf, InferData, USA

Abstract: This tutorial teaches the participants how to use and extend the Eclipse Modeling Framework (EMF). Using a case study and numerous examples, the participants master the EMF framework as a generative tool for model driven development. The tutorial explores all aspects of EMF development, from creation of models for EMF, use of generators, Java Emitter Templates, concluding with an overview of model transformation technologies for EMF. The conceptual but also non-trivial practical skills gained in this tutorial will enable participants to effectively start developing their model driven applications. The skills apply both to practitioners who need to develop Eclipse tools, as well to researchers who will use Eclipse and EMF as a foundation for their experiments.

12:30 – 2:00 Lunch, on your own

2:00 – 6:00

Workshops 4, 7, 9, and 10, continued in the same locations as in the morning.

Monday, October 3

8:30 – 12:30

<u>*Cornwall III Room:*</u>

Workshop 2 MoDeVA -- Model Design and Validation - http://www.irisa.fr/manifestations/2005/MODEVA2005/
Organizers:
 Benoit Baudry, INRIA, France
 Christophe Gaston, CEA/LIST, France
 Sudipto Ghosh, Colorado State University, USA

Abstract: Formal methods have been intensively applied to evaluate reliability of systems. These methods generally require adequate specification and structuring languages to describe (a part of) the system under validation. One of the main problem encountered when trying to combine design and validation features, is that structuring languages suitable for one of the features are generally not suitable for the other. In this way, object-oriented paradigm is suitable for large scale system design, since it allows anthropomorphic design based on services exchanges of basic entities. However, this paradigm is not suitable (without restriction) for validation activities, since any enrichment of a system is likely to cause loss of global properties. In the opposite way, modular paradigm ensures properties preservation but the price to pay is an amount of design difficulties. The MoDeVa (Model Design and Validation) workshop aims at being a forum for researchers and practitioners with varying backgrounds to discuss new ideas concerning links between model-based design and model-based validation.

<u>*Hanover Room:*</u>

Workshop 5 Model Transformations in Practice - <u>http://sosym.dcs.kcl.ac.uk/events/mtip/</u>
Organizers:
 Jean Bezivin, University of Nantes
 Bernhard Rumpe, TU Braunschweig
 Andy Schuerr, TU Darmstadt
 Laurence Tratt, King's College London

Abstract: Model Transformations in Practice is a workshop to be held at the upcoming MoDELS 2005 conference. It aims to provide a forum for the model transformation community to discuss practical model transformation issues. Currently, many different model transformation approaches have been proposed and explored, but there has been too little work on comparing and contrasting various approaches. Without such comparisons, it is hard to assess new model transformation approaches, or to discern sensible future paths and upcoming standards such as the upcoming OMG MOF/QVT recommendation. The aim of this workshop is to lead to an increased understanding of the relative merits of different model transformation techniques and approaches. A more advanced understanding of such merits is of considerable benefit to both the model transformation and wider modelling communities.

<u>*Trelawny Room:*</u>

Workshop 6 WiSME -- Workshop in Software Model Engineering - http://planetmde.org/wisme-2005
Organizers:
 Krzysztof Czarnecki, University of Waterloo, Canada
 Jean-Marie Favre, University of Grenoble, France
 Martin Gogolla, University of Bremen, Germany
 Tom Mens, University of Mons-Hainaut, Belgium

Abstract: Model-Driven Engineering is a form of generative engineering, by which all or at least central parts of a software application are generated from models. Model Driven Engineering should be seen as an integrative approach combining existing software engineering techniques (e.g., testing and refinement) and technical spaces (e.g., 'ModelWare' and 'XmlWare') that have usually been studied in separation. The goal of the workshop is to improve common understanding of these techniques across technical spaces and create bridges and increase the synergies among the spaces. This year's WiSME workshop will concentrate on two complementing themes: Bridging Technical Spaces and Model-Driven Evolution.

Educator's Symposium
Organizers:
    Holger Giese, University of Paderborn, Germany
    Pascal Roques, Valtech Training, France

Abstract: Model-driven development approaches and technologies for software-based systems, in which development is centered round the manipulation of models, raise the level of abstraction and thus, improve our abilities to develop complex systems. Therefore, a number of approaches and tools have been proposed for the model-driven development (MDD) of software-based systems. Examples are UML, model-driven architecture (MDA), and model-integrated computing (MIC). Putting the model-driven development vision into practice requires not only sophisticated modeling approaches and tools, but also considerable training and education efforts. To make people ready for model-driven development, its principles and applications need to be taught to practitioners in industry, incorporated in university curricula, and probably even introduced in schools. The educator's symposium at the MoDELS conference, the premier conference devoted to the topic of model-driven engineering of software-based systems, is intended as a forum in which educators and trainers can meet to discuss pedagogy, use of technology, and share their experience pertaining to teaching modeling techniques and model-driven development.

12:30 – 2:00 Lunch, on your own

2:00 – 6:00

Workshops 2, 5, 6, and the Educator's Symposium, continued in the same locations as in the morning.

6:30 – 7:30
Oleander Terrace: **Tutorial and Workshop Reception**

Tuesday, October 4

8:30 – 12:30

Conrwall III Room:

Workshop 1 Tool Support for OCL and Related Formalisms - Needs and Trends
http://lgl.epfl.ch/members/baar/oclwsAtModels05/
Organizers:
    Thomas Baar, EPFL Lausanne, Switzerland (contact)
    Dan Chiorean, University of Cluj-Napoca, Romania
    Alexandre Correa, University of Rio de Janeiro, Brazil
    Martin Gogolla, University of Bremen, Germany
    Heinrich Hußmann, University of Munich, Germany
    Octavian Patrascoiu, University of Kent, United Kingdom
    Peter H. Schmitt, Universität Karlsruhe, Germany
    Jos Warmer, Ordina, The Netherlands

Abstract: Model-centric methodologies and new technologies such as MDA, MDSE, LDD, or DSL attract now a lot of attention both in academia and in industry. Since they propagate a shift from the implementation code to more abstract but nevertheless detailed and precise models, their successful application in industrial projects heavily depends on matured tools support. The traditional way to make a model more precise is by using a textual constraint language such as OCL. Recently, an increasing amount of work has been spent on OCL tools by various organizations so that software developers have today the choice among more than 10 academic and commercial tools. However, compared to similar tools supporting other textual languages, e.g. integrated development environments (IDEs) for Java, tools for OCL are still rather archaic. The increasing importance of OCL for model-centric methodologies on one hand and the improving but not perfect tool support for OCL on the other hand naturally raise a lot of questions. This workshop will explore these questions and solutions to the issues raised.

Workshop 3 MARTES -- Modeling and Analysis of Real-Time and Embedded Systems - http://www.martes.org/
Organizers:
Sebastien Gerard, CEA, France
Susanne Graf, Verimag, Grenoble, France
Øystein Haugen, University of Oslo, Norway
Iulian Ober, Verimag, Grenoble, France
Bran Selic, IBM, Canada

Abstract: This workshop is a merge of the former workshop series SIVOES and SVERTS. The concern of this workshop is the use of MDA in the context of Real-time, distributed and embedded systems, where a particular emphasis is put on modeling, semantic issues and methods and tools for analysis.

Workshop 8 NfC -- Models for Non-functional Aspects of Component-Based Software -
http://www.comquad.org/nfc05/
Organizers:
Jan Øyvind Aagedal, SINTEF ICT, Norway
Geri Georg, Colorado State University, USA
Raffaela Mirandola, University of Roma "TorVergata", Italy
Ileana Ober, IRIT, France
Dorina Petriu, Carleton University, Canada
Wolfgang Theilmann, SAP Research Belfast, Ireland
Jon Whittle, George Mason University, USA
Steffen Zschaler, Technische Universität Dresden, Germany

Abstract: Developing reliable software is a complex, daunting, and error-prone task. Therefore, many researchers are interested in improving the support for developers creating such software. Component-based software engineering has emerged as an important paradigm for handling complexity. In parallel, raising the level of abstraction when reasoning about systems, thus using models, is another technique for lowering the complexity. The goal of this workshop is to look at issues related to the integration of non-functional property expression, evaluation, and prediction in the context of component- based software engineering and finding the best techniques to deal-with non- functional aspects in a model based approach. This includes semantic issues, questions of modelling language definition, but also support for automation, such as analysis algorithms, MDA-based approaches, or tool-support for refinement steps. The aim of this workshop is to bring together practitioners and academics that are currently working around these topics to highlight the ongoing solutions and the problems encountered.

Doctoral Symposium
Mentors:
Aditya Agrawal, IBM TJ Watson Research, USA
Jean Bézivin, University of Nantes, France
Betty Cheng, Michigan State University, USA
Emanuel Grant, University of North Dakota, USA
Jeff Gray, University of Alabama at Birmingham, USA
Jörg Kienzle, McGill University, Canada
Ana Moreira, Universidade Nova de Lisboa, Portugal
Kerry Raymond, DSTC, Australia

Abstract: The Doctoral Symposium at the MoDELS conference will provide an international forum for doctoral students to interact with other students and faculty mentors. The Doctoral Symposium seeks to bring together PhD Students working in areas related to modeling and model-driven engineering. Selected students will have the opportunity to present and to discuss their research goals, methods and results within a constructive and international atmosphere. The Symposium organizers will strive to provide useful guidance for completion of the dissertation research and initiation of a research career. The symposium is intended for students who have already settled on a specific research proposal and have some preliminary results, but still have enough time remaining before their final

defense so that they can benefit from the Symposium discussions. Among the ten students selected to participate in the Symposium, seven students will offer a formal presentation and three students will discuss their work through a poster presentation. Due to the mentoring aspect of the event, the Symposium will be open only to those students and mentors participating directly in the event.

Westmoreland Room:

Tutorial 5 An Overview of UML 2.0
    Presenter:
    Bran Selic, IBM Software Group - Rational Software, Canada

Abstract: The first major revision of the UML standard, UML 2.0, has recently been adopted by the Object Management Group. This version of the language was strongly influenced by the recent maturation of model-driven development (MDD) methods and technologies. The tutorial describes the major new features and capabilities of UML 2.0 with a full explanation of the rationale and design philosophy for each. The presenter is currently chairing the OMG team responsible for maintaining the standard.

12:30 – 2:00 Lunch, on your own

2:00 – 6:00

Workshops 2, 5, 6, and the Educator's Symposium, continued in the same locations as in the morning.

Westmoreland Room:

Tutorial 6 Software Factories: Using Domain Specific Languages, Patterns, Frameworks and Tools to Assemble Applications
    Presenter:
    Steve Cook, Microsoft Corporation, Cambridge, UK

Abstract: Increasingly complex and rapidly changing requirements and technologies are making application development increasingly difficult. This tutorial explores this phenomenon, and presents the Software Factory pattern for building languages, patterns, frameworks and tools for specific domains, such as user interface construction or database design. We discuss the forces acting towards increasing industrialization of software development through delivery of knowledge and automation in context. We explore innovations, such as software product lines and model driven development, which reduce the cost of implementing the pattern, making it cost effective for narrower and more specialized domains, such as B2C application development and business process automation. We introduce the concept of the software schema, a network of viewpoints describing artifacts comprising the members of a family of software products, and we show how mappings between these viewpoints can be used to provide constraints supporting model transformation and self organizing processes. Examples and demonstrations are used throughout to illustrate the concepts.

Wednesday, October 5

8:30 – 9:00

Hanover Room: **Welcome and Opening Remarks**

9:00 – 10:00

Hanover Room: **Keynote Speaker**: Dr. Douglas C. Schmidt, Vanderbilt University, USA - Model Driven Development for Distributed Real-time and Embedded Systems

Abstract: Despite advances in standards-based commercial-off-the-shelf (COTS) technologies, key challenges must be addressed before COTS software can be used to build mission-critical distributed real-time and embedded (DRE) systems effectively and productively. For example, developers of DRE systems continue to use ad hoc means to select and compose their applications and middleware due to the lack of formally analyzable and verifiable building block components. This talk will describe how Model Driven Development (MDD) techniques and tools can be used to specify, analyze, optimize, synthesize, validate, and deploy product-line architectures and standards-compliant middleware platforms that can be customized for the needs of next-generation DRE systems. This talk will compare and contrast MDD and MDA approaches to model-driven development of DRE systems. It will also illustrate how MDD techniques and tools have been successfully integrated with standards-based QoS-enabled component

middleware to develop product-line architectures that significantly improve the quality and productivity associated with developing next-generation mission-critical DRE systems. Concrete examples from avionics, process control, and warehouse management systems will be used to illustrate key points.

10:00 – 10:30

Cornwall I Room: Coffee Break & Poster Session

10:30 – 12:00

Hanover Room: **Session 1: Process**
Chair: Geri Georg
Activity Diagram Patterns for Modeling Quality Constraints in Business Processes
Alexander Foerster, Gregor Engels, Tim Schattkowsky
UML4SPM: A UML2.0-Based metamodel for Software Process Modelling
Reda Bendraou, Marie-Pierre Gervais, Xavier Blanc
Realizing Model Driven Security for Inter-Organizational Workflows with WS-CDL and UML 2.0
Michael Hafner, Ruth breu

Trelawny Room: **Session 2: Product families and Reuse**
Chair: Oscar Nierstrasz
Code generation from UML Models with semantic variation points
Franck Chauvel, Jean-Marc Jézéquel
Composing Domain Specific Languages for Wide-Scope Software Engineering Applications
Jacky Estublier, German Vega, Anca Daniela Ionita
Model Typing for Improving Reuse in Model-Driven Engineering
Jim Steel, Jean-Marc Jezequel

Heliconia Room: **Session 3: State/Behavior Modeling**
Chair: Betty Cheng
UML vs. Classical vs. Rhapsody Statecharts: Not All Models are Created Equal
Michelle Crane, Juergen Dingel
Evaluating the Effect of Composite States on the Understandability of UML Statechart Diagrams
José A. Cruz-Lemus, Marcela Genero, M. Esperanza Manso, Mario Piattini
Computing Refactorings of Behavior Models
Alexander Pretschner, Wolfgang Prenninger

12:00 – 2:00

Cornwall II & III Rooms: Lunch (provided)

2:00 – 3:30

Hanover Room: **Session 4: Aspects**
Chair: Jean-Marc Jezequel
Dynamic Secure Aspect Modeling with UML: From Models to Code
Jan Juerjens and Siv Hilde Houmb
Performance Analysis of UML Models using Aspect Oriented Modeling Techniques
Hui Shen, Dorina C. Petriu
Domain Models are Aspect Free
Friedrich Steimann

Trelawny Room: **Session 5: Design Strategies**
Chair: Jean-Michel Bruel
Representing and applying design patterns: what is the problem?
Hafedh Mili, Ghizlaine El Boussaidi
Properties of Stereotypes from the Perspective of Their Role in Designs
Miroslaw Staron, Ludwik Kuzniarz
A Modelling and Simulation Based Approach for Dependable System Design
Miriam Zia, Sadaf Mustafiz, Hans Vangheluwe, Jörg Kienzle

Heliconia Room: **Session 6: Model Transformations**
Chair: Heinrich Hußmann
    Extending profiles with stereotypes for composite concepts using model transformation
    Dick Quartel, Remco Dijkman, Marten van Sinderen
    Transformation from CIM to PIM: A Feature-Oriented Component-Based Approach
    Wei Zhang, Hong Mei, Haiyan Zhao
    Weaving Executability into Object-Oriented Meta-Languages
    Pierre-Alain Muller, Franck Fleurey, Jean-Marc Jézéquel

3:30 – 4:00

Cornwall I Room: Coffee Break & Poster Session

4:00 – 5:00

Hanover Room: **Panel 1 - What would be the ideal meta-modeling infrastructure?**
Chair: Pierre-Alain Muller

Abstract: The goal of this panel is to discuss the requirements for an ideal meta-modeling architecture. The panel will address the following points: What is the scope of meta-modeling? How to reconcile domain-oriented meta-hierarchies with language-oriented meta-hierarchies? What would be a minimal core meta-language? What kind of tool support should be available for meta-modeling?

6:30 – 8:00

Royal Pavilion: **Conference Reception**

Thursday, October 6

9:00 – 10:00

Hanover Room: **Keynote Speaker**: Juha-Pekka Tolvanen, MetaCase, Finland - Domain-Specific Modeling: No one size fits all

Abstract: After 10 years of UML we have still not overcome the problems of the CASE tools of the 1980's. Imposing a one-size-fits-all modeling language and generators has not significantly increased developers' productivity. Domain-Specific Modeling (DSM) provides a viable solution for improving development productivity by moving the focus from implementation concepts to problem domain concepts. With DSM, a new modeling language is created for each problem domain, with elements representing concepts from the domain world, not the code world. The DSM language follows domain abstractions and rules, guiding developers and allowing them to perceive themselves as working directly with domain concepts. When the domain is narrowed down to fit a single company's needs, domain-specific code generators can automatically produce full code straight from the models. Industrial experiences - in cases ranging from embedded software to B2B J2EE web sites - have consistently shown productivity increasing by a factor of 5-10. This talk will introduce DSM and look at examples from various fields of software product development, and we explore the principles of creating DSM languages and generators.

10:00 – 10:30

Cornwall I Room: Coffee Break

10:30 – 12:00

Hanover Room: **Session 7: Model Refactoring**
Chair: Timothy Lethbridge
    Refactoring OCL Annotated Class Diagrams
    Slavisa Markovic, Thomas Baar
    Replicators: Transformations to Address Model Scalability
    Jeff Gray, Yuehua Lin, Jing Zhang, Steve Nordstrom, Aniruddha Gokhale, Sandeep Neema , and Swapna Gokhale
    Simplifying Transformations of OCL Constraints
    Martin Giese, Daniel Larsson

Trelawny Room: **Session 8: Quality Control**
Chair: Alexander Pretschner
>**Lessons Learned from Metrics-Based Automated Analysis of Industrial UML Models (An Experience Report)**
>Betty H.C. Cheng, Ryan Stephenson, Brian Berenbach
>**Reliability Prediction in Model Driven Development**
>Genaína Rodrigues, David Rosenblum, Sebastian Uchitel
>**Model-Based Scalability Estimation in Inception-Phase Software Architecture**
>Steve Masticola, Andre Bondi, Mark Hettish

Heliconia Room: **Session 9: MDA**
Chair: Pierre-Alain Mueller
>**Explicit Platform Models for MDA**
>Dennis Wagelaar
>**Integrated Model-Based Software Development, Data Access and Data Migration**
>Behzad Bordbar, Dirk Draheim, Matthias Horn, Ina Schulz, Gerald Weber
>Invited presentation 1: **Lessons Learned, New Directions, and Migration Plans for Model-Driven Development of Large Scale Software Based Systems**
>Michael J. Marich and Haig F. Krikorian

12:00 – 2:00

Cornwall II & III Rooms: Lunch (provided)

2:00 – 3:30

Hanover Room: **Session 10: Automation**
Chair: Robert France
>**Concepts for Comparing Modeling Tool Architectures**
>Colin Atkinson, Thomas Kuehne
>**Scenario Construction Tool based on Extended UML Metamodel**
>Michal Smialek, Jacek Bojarski, Wiktor Nowakowski, Tomasz Straszak
>Invited presentation 2: **Experiences in Applying Model Based System Testing Generation**
>Marlon Vieira

Trelawny Room: **Session 11: UML 2.0**
Chair: Bran Selic
>**The Impact of UML 2.0 on Existing UML 1.4 Models**
>Julie A. Street, Robert G. Pettit IV
>**Towards UML2 Extensions for Compact Modeling of Regular Complex Topologies**
>Arnaud Cuccuru, Jean-Luc Dekeyser, Philippe Marquet, Pierre Boulet
>**Using UML 2.0 Collaborations for Compositional Service Specification**
>Richard Torbjørn Sanders, Humberto Nicolás Castejón, Frank Alexander Kraemer, Rolv Bræk

Heliconia Room: **Session 12: Industrial Experience**
Chair: Clay Williams
>**Model-Driven Engineering in a Large Industrial Context - Motorola Case Study**
>Paul Baker, Frank Weil, Shiou Loh
>**Using a Domain-Specific Language and custom tools to model a multi-tier service-oriented application - experiences and challenges**
>Marek Vokac, Jens M. Glattetre
>Invited presentation 3: **The Architects Workbench - Research in the Trenches**
>Doug Kimelman

3:30 – 4:00

Cornwall I Room: Coffee Break

4:00 – 5:00

<u>Hanover Room</u>: **Panel 2 - A DSL or UML Profile. Which would you use?**
Chair: Stuart Kent

Abstract: In implementing model driven approaches to software development, there is some debate about the languages to use for modelling. On one side, there is the UML, advocates of which might argue that it has everything you'll need and its profiling mechanisms are quite adequate to cope with any customization or specialization you might need. On the other side are those advocating domain specific languages, who might argue that most of the time you're going to need to specialize and customize the language you use for modelling, that UML is not a good starting point for such specialization, and UML profiles are weak mechanism for extensibility anyway. Let's instead put together technology appropriate for building DSLs, they'd say. Of course, within the DSL camp, there's further debate about what is the right technology, but perhaps that's the topic of another panel... we'll see.

7:00 – 10:00

<u>Sugar Mill</u>: **Conference Banquet**

Friday, October 7

9:00 – 10:30

<u>Hanover Room:</u> **Session 13: Cross-cutting Concerns**
Chair: Oscar Nierstrasz
    Uniform Support for Modeling Crosscutting Structure
    Maria Tkatchenko, Gregor Kiczales
    Modeling Crosscutting Services with UML Sequence Diagrams
    Martin Deubler, Michael Meisinger, Sabine Rittmann, Ingolf Krueger
    A Formal Enforcement Framework for Role-Based Access Control using Aspect-Oriented Programming
    Jaime Pavlich-Mariscal, Laurent Michel, Steven Demurjian

<u>Trelawny Room:</u> **Session 14: Modeling Strategies**
Chair: Gianna Reggio
    A Domain Model for System Dynamic Reconfiguration
    D'Arcy Walsh, Francis Bordeleau, Branislav Selic
    Exceptional Use Cases
    Aaron Shui, Sadaf Mustafiz, Jörg Kienzle, Christophe Dony

9:30 – 10:30

<u>Heliconia Room:</u> **Panel 3 - Building Better Systems: Modeling, Verification, and Testing**
Chair: Clay Williams

Abstract: A stated goal of model-based software development is that software quality will drastically improve as a result of the use of modeling methods. This hope has been held out repeatedly in the past by other software development movements, including formal methods, computer aided software engineering (CASE), and various process movements, such as the Cleanroom approach to building software. The participants in this panel will explore whether we are reasonable in hoping that modeling as we know it today will significantly assist with quality issues. In doing so, they will discuss what the major technical issues are that need to be addressed in order to achieve higher quality software, and propose a research agenda for addressing these issues. The panelists will pay particular attention to the use of modeling languages to facilitate better testing, as well as how modeling languages can be used as a basis for verification approaches such as model checking and theorem proving.

10:30 – 11:00

<u>Cornwall I Room</u>: Coffee Break

11:00 – 12:30

<u>Hanover Room</u>: **Session 15: MDA II**
Chair: François Terrier
>   **Modeling Turnpike Frontend System: a Model-Driven Development Framework Leveraging UML Metamodeling and Attribute-Oriented Programming**
>   Hiroshi Wada, Junichi Suzuki
>   **Simplifying the Development of Autonomic Enterprise Java Bean Applications via Model Driven Development**
>   Jules White, Douglas C. Schmidt, Aniruddha Gokhale

<u>Trelawny Room</u>: **Session 16: Automation II**
Chair: Thomas Baar
>   **Automated Invariant Maintenance via OCL Compilation**
>   Spencer Rugaber, Kurt Stirewalt
>   **SelfSync: A Dynamic Round-Trip Engineering Environment**
>   Ellen Van Paesschen, Maja D'Hondt
>   **UML for Document Modeling: Designing Document Structures for Massive and Systematic Production of XML-Based Web Contents**
>   Alejandro Bia, Jaime Gómez

<u>Heliconia Room</u>: **Session 17: Modeling Strategies II**
Chair: Colin Atkinson
>   **Metamodel Reuse with MOF**
>   Xavier Blanc, Franklin Ramalho, Jacques Robin
>   **Modeling the User Interface of Multimedia Applications**
>   Andreas Pleuss
>   **An ontology-based approach for evaluating the domain appropriateness and comprehensibility appropriateness of modeling languages**
>   Giancarlo Guizzardi, Marten van Sinderen, Luis Ferreira Pires

12:30 – 2:00 Lunch, on your own

2:00 – 2:30
<u>Hanover Room</u>: **Closing Remarks, MoDELS 2006**

Sugar Mill

Golf Course
(Not to Scale)

Squash Courts
David Leadbetter
Golf Academy
Golf Pro Shop
19th Hole Bar

Aerobics
Badminton
Bars
Beach Bar
Hibiscus Bar
Lester's Bar
Oleander Bar
Royal Pavilion
Royal Stocks Pub

Basketball
Bell Desk
Bicycle/Cart Rental
Car Rental/Tour Desk
Children's Centre
Concierge
Commissaries
Oleander
Shopping Village

Golf Gate
Village Gate
Service Gate

Royal Villa Gate

Royal Villas

Giant Chess

Medical Center

Lily Pond Wedding Gazebo

NATURE RESERVE

Shopping Village

Sunrise Beach

Watersports & Scuba Centre

Boats & Canoe

Croquet

18-hole Putting Course

Dolphin Lagoon

HALF MOON
— MONTEGO BAY —

400 acre estate with 2 miles of white sand beach

Oleander Superior Rooms

Oleander Terrace

Royal Villas Cornwall Conference Center
-Trelawny
- Hanover
- Westmoreland (lower level)
- St. Elizabeth (lower level)
- Manchester (lower level)

Heliconia

Royal Pavilion

Oleander Terrace

# MoDELS 2006 will be held in Genova, Italy October 1-6, 2006

The conference will be hosted in the very heart of Genoa's old quarter, the liveliest and most picturesque part of the city.

Genoa, or Genova, comes from the Latin *janua* - gate. A gateway to the sea, which also closes behind it a wealth of treasures: a dense and fascinating warren of medieval alleyways full of historical buildings, from early mediaeval to Renaissance and Baroque palaces, churches and museums.

Since the celebration of the 500th anniversary of Columbus's 1492 voyage to America, the city is living a new renaissance, as host of the G8 meetings in 2001 and European Capital of Culture in 2004.

Weather:
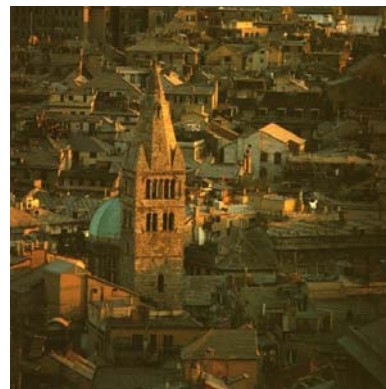
Transportation: Genova is easily reachable. Indeed, it has an airport (Christoforo Colombo) with daily direct flights for Roma, Milano, Napoli, Paris, London, and Munich, it is served by the railway lines Ventimiglia-Genova-La Spezia, Genova-Torino and Genova-Milano, it is connected by motorways to Côte d' Azur (A10), Tuscany and southern Italy (A12), Milano (A7), Torino and Valle d'Aosta (A26), and, finally, ferries sail to Genova from the main ports of the Mediterrean.

Month	Avg. High	Avg. Low	Avg. Precip.
September	24.0° C (75.7° F)	18.0° (63.9°) F	10.00 cm (3.90) in
October	20.0° C (68.5° F)	14.0° C (57.2° F)	15.00 cm (6.00 in)

Useful Web Sites:
http://www.airport.genova.it/eng
http://www.apt.genova.it/inglese/index_gb.htm
http://www.ge.infn.it/~opisso/Tour/tourism.html
http://www.cntraveller.co.uk/Guides/Italy/Genoa/Default.aspx?Page=6

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