

## Welcome to ECOOP 2006 in Nantes

*The organizing committee is happy to welcome you in our beautiful city of Nantes to celebrate the 20<sup>th</sup> anniversary of the European Conference on Object-Oriented Programming.*

*Since its first edition in Paris, ECOOP has travelled all around Europe hosted by Glasgow in 2005, Oslo in 2004, Darmstadt in 2003, Malaga in 2002, Budapest in 2001, Cannes in 2000, Lisbon in 1999, Brussels in 1998, Jyväskylä in 1997, Linz in 1996, Aarhus in 1995, Bologna in 1994, Kaiserlautern in 1993, Utrecht in 1992, Geneva in 1991, Ottawa (jointly with OOPSLA) in 1990, Nottingham in 1989, and Oslo in 1988. For these twenty years ECOOP has been the premier forum in Europe for annually bringing together practitioners, researchers and students from all over the world to share their ideas and experiences in a broad range of disciplines woven with the common thread of object technology.*

*This year, ECOOP will take place in the International Convention Centre of Nantes: "la Cité des Congrès". ECOOP 2006 is organized by the Ecole des Mines of Nantes and the University of Nantes (the CNRS LINA Computer Sciences Laboratory) with the support of INRIA and ERCIM. It is held under the auspices of AITO, the Association Internationale pour les Technologies Objets, in cooperation with ACM, SIGPLAN and SIGSOFT.*

*As always, ECOOP benefits enormously from the dedication of many people. We would like to thank Dave Thomas and the program committee for the huge task of selecting 20 papers from 162 submissions. Thanks also to Jacques Malenfant for hosting the program committee meeting at the University of Paris 6 and to Richard van de Stadt for he once again provided invaluable support for the CyberChairPRO electronic reviewing process and the production of the proceedings.*

*We are very happy to host the second awards of the AITO Dahl-Nygaard prizes honouring Erich Gamma, Richard Helm, Ralph Johnson and (posthumously) John Vlissides. Eric Jul was the chair of the selection committee. We also welcome Serge Abiteboul to present a keynote talk.*

*We are especially pleased to welcome this 20<sup>th</sup> edition, and Jean-François Perrot had the hard duty to set up the special anniversary invited panel and to bring in Nantes Jérôme Chailloux, Steve Cook, William Cook, Ole Lehrmann Madsen, Henry Lieberman and Akinori Yonezawa.*

*This year, ECOOP receives a large number of workshops providing forum for launching new research directions. We also offer our thanks to the workshop leaders for their efforts.*

*We wish to thank those giving tutorials, presenting demonstrations, offering posters and running the impromptu birds-of-a-feather sessions for their activities, all of which add to the richness of the ECOOP tapestry.*

*Finally, organizing serenely such a conference requires the financial support of many sponsors. Special thanks for Nantes Metropole, Pays de la Loire and Bretagne councils our local supporters but also to Microsoft Research, Sun microsystems, Google, IBM Research, France Télécom, ILOG, Sodius, Softeam and IST, the ECOOP 2006 corporate supporters.*

*Enjoy your stay in Nantes !  
Pierre Cointe, on behalf of the organizing committee.*



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## CONFERENCE AT A GLANCE

### Monday and Tuesday

21 workshops including "the Doctoral Symposium and PhD Students Workshop", 11 tutorials, a Welcome Party on Monday and the presentation of some Posters during the Tuesday cocktail.

Workshop and Tutorial Program				
	Monday		Tuesday	
	Workshops	Tutorials	Workshops	Tutorials
09:00	W 1 to W 12	T 1 T 3 T 5	W 14 to W 25	T 7 T 9
10:30	Coffee Break		Coffee Break	
11:00	Workshops cont'd.	Tutorials cont'd.	Workshops cont'd.	Tutorials cont'd.
12:30	Lunch		Lunch	
14:00	Workshops cont'd.	T 2 T 4 T 6	Workshops cont'd.	T 8 T 10 T 12
15:30	Coffee Break		Coffee Break	
16:00	Workshops cont'd.	Tutorials cont'd.	Workshops cont'd.	Tutorials cont'd.
17:00	Workshops end		Workshops end	
17:30		Tutorials end		Tutorials end
18:30 20:00	Welcome Party at "le Lieu Unique"		Cocktail and Poster Party at the Convention Centre	

### Wednesday, Thursday and Friday

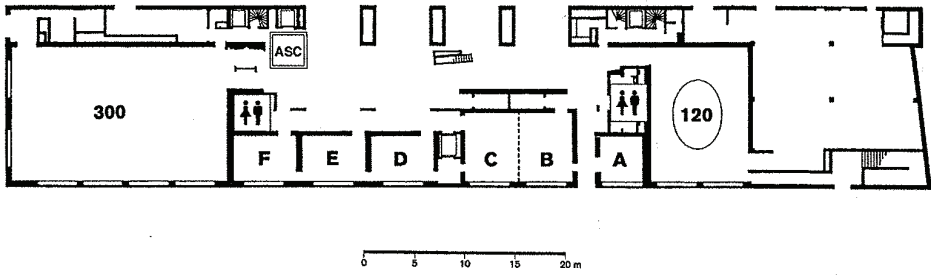
The whole technical conference will take place in the Auditorium from Wednesday to Friday.

Technical Papers			
	Wednesday	Thursday	Friday
08:30	<b>Opening</b>		
09:00	<b>Keynote</b> Erich Gamma	<b>Keynote</b> Serge Abiteboul	<b>Keynote</b> Ralph Johnson
10:00	Coffee Break	Coffee Break	Coffee Break
10:30	<b>Program Query and Persistence</b>	<b>Languages</b>	<b>Tools</b>
11:00			
11:30			
12:00	Lunch	Lunch	Lunch
12:30			
13:00			
13:30	<b>Ownership and Concurrency</b>	<b>Type Theory 1</b>	<b>Modularity</b>
14:00			
14:30			Closing
15:00			
15:30	Coffee Break	Coffee Break / Posters	
16:00	<b>Special 20th Edition Session</b>	<b>Type Theory 2</b>	
16:30			
17:00		<b>Free Time</b>	
17:30			
18:00	<b>Civic Reception at the "Musée des Beaux Arts"</b>	<b>Banquet at "Château de la Poterie"</b>	
18:30			
19:00			
19:30			

Posters and demonstrations will be presented from Tuesday (cocktail) to Friday.

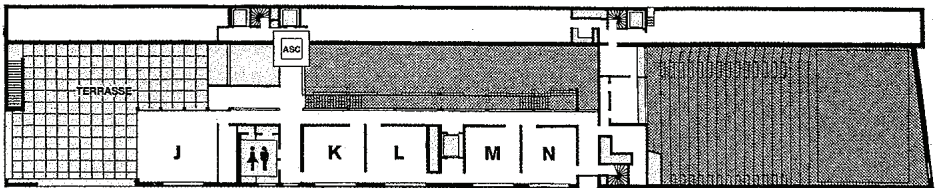
Posters and Demonstrations				
	Tuesday	Wednesday	Thursday	Friday
10:00				<b>Additional session for demos</b>
10:30		D1		
11:00		D2		
11:30		D3		
12:00				
13:30			D7	
14:00		D4		
14:30		D5		
15:00		D6		
15:30			<b>Posters</b>	D8
16:00				D9
16:30				D10
17:00				<b>Additional session for demos</b>
17:30				
18:00				
18:30	<b>Posters</b>			
19:00				
19:30				
19:30				
20:00				

## Lower Foyer

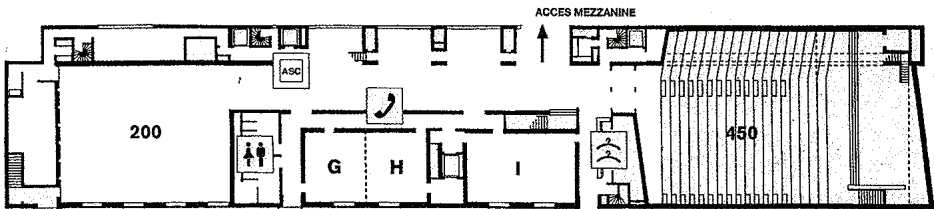


## Upper Foyer

Level 4 :



Level 2 :



## AITO Dahl-Nygaard Prizes

ECOOP 2006 is delighted to host the second awards of the AITO Dahl-Nygaard prize. Information about this prize, including the process for making nominations for future years, is available from the AITO website at [www.aito.org](http://www.aito.org)

Ole-Johan Dahl and Kristen Nygaard jointly received the ACM A.M.Turing Award in 2001 "for ideas fundamental to the emergence of object oriented programming, through their design of the programming languages Simula I and Simula 67". In 2002, they shared the IEEE John von Neumann Medal "for the introduction of the concepts underlying object-oriented programming through the design and implementation of SIMULA 67".

AITO is very proud to announce that the Dahl-Nygaard Prize for 2006 will be given to Erich Gamma, Richard Helm, Ralph Johnson, and (posthumously) John Vlissides. The four are together known as "The Gang Of Four" and they are being recognized for their contributions to the state of the art embodied in their landmark book *Design Patterns: Elements of Reusable Object-Oriented Software*. Sadly, since the nomination of The Gang Of Four, John Vlissides passed away on November 24th, 2005 after a long illness.

As Richard Helm is unfortunately not present, Erich Gamma and Ralph Johnson will receive on his behalf the Prize on Wednesday at 16:00.

They will also be the keynotes' speakers on Wednesday morning and Friday morning.

*Abstracts of Invited Talks by the 2006 AITO Dahl-Nygaard Prize*

### 9:00 - 10:00 Wednesday

*Design Patterns – 15 Years Later*

Erich Gamma (*IBM's OTI Lab, Zürich, Switzerland*)

Design patterns are now a 15 year old thought experiment. And, today, for many, software design patterns have become part of the standard development lexicon. The reason is simple: rather than constantly rediscovering solutions to recurring design problems developers can refer to a body of literature that captures the best practices of system design.

This talk looks back to the origins of design patterns, shows design patterns in action, and provides an overview of where patterns are today.

### 9:00 - 10:00 Friday

*The Closing of the Frontier*

Ralph Johnson (*University of Illinois, USA*)

Software design is usually discussed as if the system is being created "de novo", but most programmers are working on systems that have already been released. This is a sign of success, since software is now good enough to keep and is worth improving. But the way we talk about design and the way we teach it is stuck in the twentieth century. The software frontier is closing.

Although there are still new projects, it is more accurate to say "there are no new

software projects" than it is to say "all software projects are new". What would the world be like if there were no new software projects ?

If a software project has been going for fifty years then a programmer who has been on the project for twenty years will be more valuable than someone who is new to the project. Old programmers will be more valuable than young programmers. If a software project is going to last another fifty years and will be actively developed during that time then it is worthwhile to keep it in good shape. It is worth fixing pesky bugs that only appear once every year. It is worth spending some time improving the documentation. It is worth rewriting parts of the system that are complex and buggy.

If a software project is on version 129 then it is clear that software development is program transformation. Each iteration transforms version N into version N+1. Although user requirements are important, version N+1 depends more on version N than it does on the latest requests from the users.

Fortunes can be made both on the frontier and in cities. The frontier and cities are different, however, and some of the rules of success of the frontier must change for the cities.

## CONFERENCE PROGRAM

### – Workshops

#### Regular Workshops on Monday, July 3rd

9:00 – 12:30    14:00 – 17:00

- **W1** — *ACE Architecture-Centric Evolution*  
Uwe Zdun (U. Vienna), Paris Avgeriou (U. Groningen)
- **W2** — *ADI Aspects, Dependencies and Interactions*  
Ruzanna Chitchyan (U. Lancaster), Johan Fabry (VU Brussel), Lodewijk Bergmans (U. Twente), Andronikos Nedos (TC Dublin), Arend Rensink (U. Twente)
- **W3** — *DSPD Domain-Specific Program Development*  
Laurent Réveillère (INRIA/LaBRI Bordeaux), Julia Lawall (DIKU, Copenhagen)
- **W4** — *ELW European Lisp Workshop*  
Pascal Costanza (VUB), Theo d'Hondt (VUB), Arthur Lemmens, Christophe Rhodes (U. London)
- **W5** — *Fractal Fractal Workshop: leveraging an European open source community around the Fractal component model*  
Thierry Coupaye (FT, Grenoble), Jean-Bernard Stéfani (INRIA, Grenoble)
- **W6** — *ICOOLPS Implementation, Compilation, Optimization of Object-Oriented Languages, Programs and Systems*  
Roland Ducournau (U. Montpellier), Etienne Gagnon (UQAM, Montréal), Chandra Krintz (U. California, Santa Barbara), Philippe Mulet (IBM, Saint Nazaire), Jan Vitek (Purdue U.), Olivier Zendra (INRIA/LORIA, Nancy)
- **W7** — *MA Models and Aspects — Handling Crosscutting Concerns in MSDS*  
Christa Schwanninger (Siemens, Munich), Markus Voelter, Iris Groher (Siemens, Munich), Andrew Jackson (Trinity College, Dublin)
- **W8** — *POOSC Parallel/High-Performance Object-Oriented Scientific Computing*  
Wolfgang Bangerth (Texas A&M University), Kei Davis (Los Alamos National Laboratory), Jörg Nolte (Brandenburg University of Technology), Hans Petter Langangen (Simula Research Lab), Tiago Quintino (von Karman Institute), Jeremy Siek (Rice University), Jörg Striegnitz (Eupidus Consulting)
- **W9** — *QAOOSE Quantitative Approaches in Object-Oriented Software Engineering*  
Fernando Brito e Abreu (U. Lisbon), Coral Calero (U. Extremadura, Ciudad Real), Yann-Gaël Guéhéneuc (U. Montréal), Michele Lanza (U. Lugano), Houari A. Sahraoui (U. Montréal)

- **W10** — *RDL Revival of Dynamic Languages*  
Wolfgang De Meuter (*VU Brussels*), Roel Wuyts (*U. Brussels*), Stéphane Ducasse (*U. Savoie, Annecy*), Mira Mezini (*TU Darmstadt*), Mehmet Aksit (*U. Twente, Enschede*)
- **W11** — *TLOOC. Pedagogies and Tools for the Teaching and Learning of Object Oriented Concepts*  
Jürgen Börstler (*Umea U.*), Isabelle Michiels (*VU Brussels*), Kim Bruce (*Pomona College, Claremont*), Morten Lindholm (*Aarhus U.*)
- **W12** — *WCOP Component-Oriented Programming*  
Ralf Reussner (*U. Oldenburg, Karlsruhe*), Clemens Szyperski (*Microsoft, Redmont*), Wolfgang Weck (*Zurich*)

### Regular Workshops on Tuesday, July 4th

9:00 – 12:30    14:00 – 17:00

- **W14** — *FTfJP Formal Techniques for Java-like Programs*  
Elena Zucca (*U. Genova*), Davide Ancona (*U. Genova*), Sophia Drossopoulou (*Imperial College, London*), Susan Eisenbach (*Imperial College, London*), Gary T. Leavens (*U. Iowa, Ames*), Peter Mueller (*ETH Zurich*), Arnd Poetzsch-Heffter (*U. Kaiserslautern*), Erik Poll (*U. Nijmegen*)
- **W16** — *OT4Aml Object Technology for Ambient Intelligence*  
Holger Mügge (*U. Bonn*), Pascal Cherrier, Wolfgang de Meuter (*VU Brussels*), Éric Tanter (*U. Chili, Santiago*)
- **W17** — *PASSWORD Program Analysis for Security and Safety*  
Francesco Logozzo (*ENS Paris*), Marco Pistoia (*IBM T.J. Watson*)
- **W19** — *RAM-SE Reflection, AOP and Meta-Data for Software Evolution*  
Walter Cazzola (*U. Milano*), S. Chiba (*Tokyo Tech*), Yvonne Coady (*U. Victoria*), G. Saake (*U. Magdeburg*)
- **W21** — *TEAM Towards Evaluation of Aspect Mining*  
Silvia Breu (*U. Saarbruecken*), Magiel Brunting (*CWI, Amsterdam*), Jens Krinke (*U. Hagen*), Leon Moonen (*U. Delft*)
- **W22** — *WCAT Coordination and Adaptation Techniques for Software Entities*  
Steffen Becker (*U. of Karlsruhe*), Carlos Canal (*U. Malaga*), Nicolai Diakov (*CWI, Amsterdam*), Juan Manuel Murillo (*U. of Extramadura*), Pascal Poizat (*U. Evry*), Massimo Tivoli (*U. L'Aquila*)
- **W23** — *WOOR Workshop on Object-Oriented Reengineering*  
Serge Demeyer (*U. Antwerp*), Stéphane Ducasse (*U. Savoie, Annecy*), Yann-Gaël Guéhéneuc (*U. Montréal*), Kim Mens (*U. Leuven*), Roel Wuyts (*U. Brussels*)

## ■ Special Workshops and co-located events

- **W24** — *eTX Eclipse Technology eXchange workshop*  
Annick Fron (*AFC Europe*), Bjorn Freeman Benson (*Eclipse Foundation*),  
Philippe Krief (*IBM France*)
- **W25** — *Doctoral Symposium and PhD Students Workshop*  
Mircea Trofin (*chair, U.C. Dublin*), Ada Diaconescu (*Dublin City U.*), Stephanie  
Balzer (*ETH Zurich*), Robert Bialek (*U. Copenhagen*), Simon Denier (*EM Nantes*).

## ■ Canceled Workshops

- **W13** — *ELW (2ND day): "European Lisp Workshop"*
- **W15** — *LESGAD "Languages and Execution Support for Grid Application Development"*
- **W18** — *PPPL "Practical Problems of Programming in the Large – Industrial Problems, Technology Transfer, Research Validation"*
- **W20** — *SMCIS "Semantic Modelling of Complex Information Systems"*

## - Tutorials

### Tutorials on Monday, July 3rd

Morning 9:00 – 12:30

- **T1** — *MDA: Techniques for letting MDA be accessible to all*  
Philippe Desfray (Softeam)

Level: intermediate

Required experience: The audience should be aware of modeling practices. Knowledge of UML is recommended, and initial knowledge of MDA would help.

MDA is now supported by a wide variety of standards, notably UML2 and MOF2 or XMI2.1. Other standards are expected, such as QVT or MOF2text. MDA is a technology that is already supported by many tools, that has been used within a large number of applications, and that many people from the software community are aware of. There is a general agreement that MDA can provide a breakthrough in software productivity and quality in many situations. But still, MDA is not having a widespread usage and recognition for software application developments.

Why is there such a situation ? What is missing ?

This tutorial will first recall the MDA technique, put a specific emphasis on UML and its extension mechanism (Profile), and present the expected features that should facilitate the dissemination of the MDA technology. It takes its sources from the MODELWARE European research project, and from the internal research effort conducted within SOFTEAM.

#### Speaker's profile

Philippe DESFRAY, is an expert in object oriented method, and VP for R&D in the SOFTEAM company. He has created an object oriented method in 1990, published three books, in particular "Object Engineering - The fourth dimension - APISON WESLEY - 1994." and has conducted the development of the Objecteering Case tool. In 1994, he has introduced a technique called "Hypergenericity" close to the UML profile technique, supporting model transformation.

His continuous work on Model driven engineering has conducted him to heavily influence the "UML Profile standard", and to drive the development of MDA based evolutions of the Objecteering case tool. Since 1994, Philippe Desfray represents SOFTEAM as a Contributing Member at the OMG, and actively participates to the UML definition, and to new standards such as "SPEM". In particular, Philippe has been leading the definition of the UML Profile mechanism for UML1.4, and UML2.0.

- **T3** — *An Introduction to .NET using Visual Basic 9 and C# 3.0*  
Erik Meijer (Microsoft)

Level: Introductory

In the past two years I have been working closely with the Visual Basic and C# teams on the design of the next generation of their respective languages. As a result, the next versions of C# and Visual Basic will bring many features such

as local type inference, anonymous types, nested functions and lambda expressions, extension members, meta-programming, and monad comprehensions, that we know and love from programming language research into the mainstream. Visual Basic adds further functionality such as deep XML support, relaxed delegates, strong duck typing, and dynamic identifiers, that leverage it's unique trait of having static typing where possible and allowing dynamic typing where necessary. This tutorial will give a behind-the-scenes peek into these new language features that will both include their formal semantics using horizontal lines and greek symbols to satisfy the programming language theorist as well as many real-world examples to satisfy the working programmer.

#### Speaker's profile

Erik Meijer is an architect/language pimper in the SQL Server division where he and Brian Beckman run a small team that collaborates closely with the Visual Basic and C# teams on making programming against data radically simpler. In the past, Erik has worked on real and imaginary programming languages such as Haskell, Mondrian, and Comega.

- T5 — *The Eclipse Debug Framework*  
Bjorn Freeman-Benson (*Eclipse Foundation*)

#### Level and Required Experience:

Experience with Eclipse is very useful because while the concepts of debuggers are universal, the code examples are all directly taken from/coded as Eclipse frameworks.

This tutorial covers the design and extension points of the Eclipse Debug framework, and specifically how to add debugger support for a new language or application to the Eclipse IDE. Most of the tutorial examples use a small assembly language for educational simplicity, but the lessons and techniques apply to languages and applications of all complexities. We investigate larger applications of the Debug Framework by showing a few of the Eclipse Java debugger. The tutorial is divided into a eight modules. Each module consists of lecture followed by an in-class exercise. The tutorial notes contain much more material than can be covered in a half-day, so after the background modules we ask the audience to choose the issues the rest of the course will cover. The tutorial is based on the 2005 OOPSLA tutorial and describes how to develop a debugger based on the standard debug model in the debug platform.

#### Speaker's profile

Bjorn is the Director for Open Source Process at the Eclipse Foundation, a position that is tailor-made for someone with his keen interest and experience in building high-quality software with geographically distributed teams. He has dabbled in applications and user interfaces, but returns, like the swallows to San Juan Capistrano, to his three foci: hardware, software, and process (embedded devices, programming languages, and software engineering). Bjorn has worked for OTI, Amazon.com, Rational, and Gemstone, along with a career as a university professor. He has an M.Sc. and a Ph.D. in Computer Science from the University of Washington, and is happy to talk at length about his passion for orienteering and/or his love of flying.

**Afternoon 14:00 – 17:30**

- **T2** — *EJB3 and Annotations: annotation driven metadata of domain models*  
Emmanuel Bernard (*JBossEurope*)

Level and Required experience:

General knowledge of ORM (Object Relational Mapping) expected. Practical experience of one / two months preferable. No knowledge of EJB3 nor annotations is required.

A great technology has come in the Java space for development productivity and ease of use: annotations.

Annotations are particularly suited to define domain model centric metadata. EJB3 Persistence uses annotations to define the expected related metadata. This tutorial will drive you into the annotations defined by the EJB3 specification, how to use them on a day to day basis, but also their underlying design.

Annotations are much more than that. An excerpt will be given through the annotations driven domain model constraints definition and the use of Hibernate Validator as a constraint checker. " Define once, check anywhere ".

After this tutorial you should be able to map your persistent domain model using EJB3 annotations. You also should be able to use Hibernate Validator as your constraint checker framework and you should have been made aware of the usage of annotations in your day to day programmer's life.

Speaker's profile

Emmanuel Bernard is involved in the Object Relational Mapping space for more than 3 years and a member of the Hibernate team for more than 2 years. As a current JBoss Europe core developer, Emmanuel is the lead developer of Hibernate Annotations and Hibernate EntityManager, two key projects on top of Hibernate core to implements the EJB3 specification. Part of his position is to frequently give JBoss Hibernate trainings and consulting across Europe. Emmanuel is also a member of the EJB3 expert group for more than a year now.

- **T4** — *A Language Geek Perspective of LINQ, XLINQ, DLINQ*  
Erik Meijer (*Microsoft*)

Level: Intermediate

Modern applications operate on data in several different forms: Relational tables, XML documents, and in-memory objects. Each of these domains can have profound differences in semantics, data types, and capabilities, and much of the complexity in today's applications is the result of these mismatches. The future "Orcas" release of Visual Studio aims to unify the programming models through integrated query capabilities in C# and Visual Basic, a strongly typed data access framework, and an innovative API for manipulating and querying XML.

This tutorial explains the programming language theory roots (monads and monad comprehensions, lazy/co-inductive functional programming, meta-programming) behind language integrated queries (LINQ) and briefly discusses the language enhancements to support them. We will give an in-depth treatment of the three domain specific APIs that constitute the LINQ framework namely the standard query operators for objects, the new XLINQ API for manipulating XML, and the new DLINQ and ADO. Net object-persistence infrastructures.

### Speaker's profile

Erik Meijer is an architect/language pimper in the SQL Server division where he and Brian Beckman run a small team that collaborates closely with the Visual Basic and C# teams on making programming against data radically simpler. In the past, Erik has worked on real and imaginary programming languages such as Haskell, Mondrian, and Comega.

- **T6** — *Java Tool Smithing - Extending the Eclipse JDT*  
Jérôme Lanneluc (*IBM France*) and Martin Aeschlimann (*IBM Switzerland*)

Level: Intermediate

Required experience: JavaSE 5.0 and Eclipse 3.1 or higher

The Java development tools (JDT) contribute a set of plug-ins for Java development to Eclipse. Like the Eclipse Platform, the JDT is designed to be extended so you can add your own functionality and become a JDT tool smith. This half-day tutorial will highlight the concepts behind JDT (e.g. Java Model, AST, Search Engine) and show how to use the Eclipse Java API and extension points in your own plug-in. In addition, the tutorial will give insights into recent improvements of the JDT like support for J2SE 5.0/6.0 and the new possibility to participate in building and compiling.

Besides consuming the expected "slide show" participants will work on concrete examples as well. So bring your laptop with a working install of Eclipse (3.1 or higher) on it to get your "hands" wet by extending JDT.

### Speaker's profile

Jerome Lanneluc has been a committer on the JDT Core component since Eclipse 1.0. His areas of expertise include J2SE 5.0, Java model, DOM AST, Java search, code assist and testing. In a previous life, he worked on the Java debugger for Visual Age Micro Edition, and ENVY/XD. Jerome holds a Master degree from the University of Nantes (France).

**Tutorials on Tuesday, July 4th****Morning 9:00 – 12:30**

- **T7** — *The Fractal component model and ecosystem: supporting platforms, extensions and usages in real life*  
Jean-Bernard Stéfani (INRIA) and Thierry Coupaye (France Télécom R&D Division)

Level and Required experience:

This is an introductory tutorial. It explicitly targets newcomers into component-based programming in general and even more people who do not know Fractal yet. Intermediate and advanced users/developers are expected not to attend this tutorial but to participate to the Fractal workshop that is also organized by the same people (T. Coupaye, J.-B. Stéfani).

Fractal is an advanced component model devised initially by France Telecom and INRIA and distributed by the ObjectWeb open source consortium since 2002 (<http://fractal.objectweb.org>). The tutorial will present in details the Fractal component model and introduce some elements of the Fractal ecosystem. The first part of the tutorial will detail the Fractal model itself, focusing on its original features: recursion with sharing, reflexive control, openness. The second part will introduce some execution supports (a.k.a. implementations) among the several existing in different languages and some extensions and tools above these platforms for instance for configuration (Fractal ADL), management (Fractal JMX), contract-based programming. The last part of the tutorial will provide a more complete view of the many works going on around Fractal inside the ObjectWeb open source community and some real usages of Fractal in industry.

**Speakers' profile**

Thierry Coupaye is senior research expert at France Telecom R&D Division. He completed his PhD in Computer Science from the UJF Grenoble University, France, in 1996 in the area of active databases (Event-Condition-Action rules) and worked afterwards as a teaching and research assistant at INPG Technological University. Then he worked as a researcher at the European Bioinformatics Institute (EMBL-EBI) in Cambridge, U.K., in the area of semi-structured data management for genomics, and then in the Dassault Systems and University of Grenoble Joint Laboratory where he worked on large scale software deployment. He joined France Telecom in 2000. He lead several R&D projects in the database and software architecture areas and then took lead of the Distributed Software Architectures & Infrastructures Research Pole in 2003. He has been involved in several collaborative projects (Esprit Goodstep, ITEA Osmose, IST Artist). He is the author of more than 30 refereed articles and has participated in several program and organization committees of conferences in these areas (IDEAS, ETAPS, Euromicro, etc.). His current research interests include middleware architecture, component-based systems, aspect-oriented programming and autonomic computing. He is co-editor of the Fractal component model specification and participates to the work around Fractal ADL, Fractal JMX, extensions for aspects (AOKell, FAC), integrity constraints, contracts.

Jean-Bernard Stéfani is a research director at INRIA since 2001 where he heads the Sardes research team. Prior to that, he was the head of the Distributed Systems Laboratory in France Telecom R&D from 1995 to 2000. His research interests cover: distributed systems, operating systems, component-based systems, distributed and component-based programming, formal models for component-based and distributed programming. He is the author of more than 60 refereed papers and has participate in several program committees of international conferences

(including Middleware, SRDS, DAIS, Euromicro, FORTE, FMOODS, etc). He is co-editor of the Fractal component model specification and participates to the work around formalizing the model, Fractal ADL, the THINK implementation, the DREAM Fractal communication framework.

- **T9** — *Software Factories*  
Steve Cook (*Microsoft Corporation*)

Level: Intermediate

Required experience: Participants should be competent practitioners familiar with current software development methods, practices and technologies.

This half-day tutorial 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 artefacts comprising the members of a family of software products. Examples and demonstrations are used throughout to illustrate the concepts.

#### Speaker's profile

Steve Cook is a Software Architect in the Enterprise Frameworks and Tools group at Microsoft. Previously he was a Distinguished Engineer at IBM, whom he represented in the UML 2.0 specification process at the OMG. He has worked in the IT industry for almost 30 years, as architect, programmer, author, consultant and teacher. He is a member of the Editorial Board of the Software and Systems Modeling Journal, a Fellow of the British Computer Society, and has Masters degrees in Physics from Cambridge and Computer Science from London, and an Honorary Doctor of Science degree from De Montford University.

Steve gave a similar tutorial at MODELS 2005. He co-gave tutorials with Jack Greenfield on this topic at OOPSLA 2005 and UML/Design World 2005, and with Alan Wills at JA00 2005. He frequently gives talks on this and related subjects.

**Afternoon 14:00 – 17:30**

- **T8** — *Aspect Oriented Programming with Spring AOP and AspectJ*  
Adrian Colyer and Rob Harrop (*Interface 21*)

Level: Intermediate

Required experience: Sound knowledge of Java programming is assumed. Familiarity with basic Spring configuration a plus, but not essential. No prior experience of AOP required.

This tutorial provides an introduction to aspect-oriented programming using the Spring framework and AspectJ. Attendees will understand the principles behind AOP, and where it fits in enterprise application development. We demonstrate how to write aspects using the Spring framework, exploiting the AspectJ point cut language. The @AspectJ (annotation based) style of aspect declaration supported by AspectJ 5 will be explained, including support for using such aspects with the Spring AOP framework. Finally we look at the AspectJ language itself, how it goes beyond the capabilities of Spring AOP, and how to get started with some quick wins on your own projects.

#### Speakers' profile

Adrian Colyer is the leader of the AspectJ project on Eclipse.org and Chief Scientist at Interface21. He also contributes to the development of the Spring AOP support and the Spring-AspectJ integration.

Rob Harrop is the lead developer of the Spring AOP support and a Principal Consultant at Interface21. He is the author of five books, including "Pro Spring", a widely acclaimed and comprehensive resource on the Spring Framework.

- **T10** — *Developing a Domain-Specific Modeler with the Eclipse Graphical Modeling Framework (GMF)*  
Richard Gronback and Artem Tikhomirov (*Borland*)

Level and Required experience:

This is an introductory tutorial, although some knowledge/experience with Eclipse, EMF, and GEF is expected.

Before the introduction of the Graphical Modeling Framework (GMF) project to Eclipse, the development of domain-specific modelers was a complex task involving the combined use of both the Eclipse Modeling Framework (EMF) and Graphical Editing Framework (GEF) projects. The GMF project simplifies the process by providing a runtime and generative framework for developing graphical editors for Eclipse using a model-driven approach.

This tutorial will provide an introduction to using GMF in the production of a domain-specific model and graphical editor, beginning with a brief overview of EMF, GEF, and GMF itself. Hands-on activities will include development of a sample domain model, graphical definition, and mapping models, followed by code generation and customization of the application.

### Speaker's profile

Richard Gronback is employed by Borland Software Corporation and currently works on the Eclipse Graphical Modeling Framework (GMF) project. Formerly a Mentor at TogetherSoft Corporation, Richard has provided training on object-oriented design, design patterns, static code analysis, and model validation. Richard has presented at the Borland Developer Conference (2003-2005), UML and Design World 2005, and will be presenting a long talk on GMF at EclipseCon 2006.

Artem Tikhomirov is employed by Borland Software Corporation and currently works on the Eclipse Graphical Modeling Framework (GMF) project. Artem has been a leader in the development of Borland's Together® Edition for Eclipse product, and currently leads development on the generative tooling side of GMF. Artem will be delivering a tutorial on GMF at EclipseCon 2006.

- **T12** — *Feature Modularity in Software Product Lines*  
Don Batory (*University of Texas at Austin*)

### Level and Required experience

Basic concepts of object-orientation are assumed; no special background is necessary.

Feature Oriented Programming (FOP) is a design methodology and tools for program synthesis in software product lines. Programs are specified declaratively using features. FOP has been used to develop product-lines in widely varying domains, including compilers for extensible Java dialects, fire support simulators, network protocols, and program verification tools.

The unit of modularization in FOP are program extensions (aspects, mixins, and traits) that encapsulate the implementation of an individual feature. An FOP model of a product-line is algebra: base programs are constants and program extensions are functions (that add a specified feature to an input program). Program designs are expressions -- compositions of functions and constants -- that are amenable to optimization and analysis.

This tutorial reviews core results on FOP: models and tools for synthesizing code and non-code artefacts by feature module composition, automatic algorithms for validating compositions, and the relationship between product-lines, metaprogramming, and model driven engineering (MDE).

### Speaker's profile

Don Batory holds the David Bruton Centennial Professorship at The University of Texas at Austin. He is an Associate Editor of the Journal of Aspect-Oriented Software Development and was an Associate Editor of IEEE Transactions on Software Engineering (1999-2002).

## ■ Canceled Tutorial

- **T11** — *Agile Software Development in the Large*

## – Technical Papers

### Wednesday July, 5th

**8:30** *ECOOP 2006 Opening*

### Keynote

**9:00 - 10:00**

*Session Chair: Dave Thomas (Bederra Reserach Labs, Canada).*

*Design Patterns – 15 Years Later*

*Erich Gamma (IBM's OTI Lab, Zürich, Switzerland).*

### **10:30 - 12:00** *Program Query and Persistence*

*Session Chair: Shigeru Chiba (Tokyo Institute of Technology, Japan).*

- *CodeQuest: Scalable Source Code Queries with Datalog*  
Elnar Hajiyev, Mathieu Verbaere, Oege de Moor (*Programming Tools Group, University of Oxford, United Kingdom*).
- *Efficient Object Querying for Java*  
Darren Willis, David Pearce, James Noble (*Victoria University of Wellington, New Zealand*).
- *Automatic Prefetching by Traversal Profiling in Object Persistence Architectures*  
Ali Ibrahim, William R. Cook (*University of Texas at Austin, USA*).

### **13:30 - 15:30** *Ownership and Concurrency*

*Session Chair: Patrick Eugster (Purdue University, USA).*

- *The Runtime Structure of Object Ownership*  
Nick Mitchell (*IBM TJ Watson Research Center, USA*).
- *Flexible Ownership Types with Owner Variance*  
Yi Lu, John Potter (*The University of New South Wales, Australia*).
- *STARS: Scoped Types and Aspects for Real-Time Systems*  
Chris Andreae, James Noble (*Victoria University of Wellington, NZ*);  
Yvonne Coady, Celina Gibbs (*University of Victoria, Canada*); Jan Vitek,  
(*Purdue University, USA*); Tian Zhao, (*University of Wisconsin – Milwaukee, USA*).
- *Transparently Reconciling Transactions with Locking for Java Synchronization*  
Adam Welc, Antony Hosking, Suresh Jagannathan (*Purdue University, USA*).

**16:00 - 18:00*****Special 20th Edition Session***

- *Presentation of the Dahl Nygaard Prize to the Gang of Four.*  
Eric Jul (*VP AITO and Chair Awards Committee*).
- *The 20th Anniversary Panel – The Future of Object.*  
*Chair: Jean-François Perrot (University of Paris 6).*

ECOOP's 20th edition Special Session "Summing up the Past and trying to outline the Future". Distinguished guests from all over the world have agreed to meet in Nantes. They include Jérôme Chailloux (ERCIM), Steve Cook (Microsoft), William Cook (University of Texas), Henry Lieberman (MIT MediaLab), Ole Lehrmann Madsen (Aarhus University) and Akinori Yonezawa (Tokyo University).

They all are in senior positions with a deep technological knowledge and broad experience. They all contributed in various ways to OO Technology. They all have a lasting relationship with ECOOP. They will discuss on the strengths and weaknesses of OO Technology so far and on what the next step is likely to be.

**Thursday, July, 6th****Keynote****9:00 - 10:00***Session Chair: Pierre Cointe (Ecole des Mines de Nantes, France)*

*Turning the Network into a Database with Active XML*  
Serge Abiteboul (INRIA-Futurs, LRI, Orsay, France).

Because of information ubiquity, one observes an important trend towards transferring information management tasks from database systems to networks. We introduce the notion of data ring that can be seen as a network version of a database or a content warehouse. A main goal is to achieve better performance for content management without requiring the acquisition of explicit control over information resources. In this paper, we discuss the main traits of data rings and argue that Active XML provides an appropriate basis for such systems.

**10:30 - 12:00 Languages***Session Chair: Mira Mezini (Darmstadt University, Germany).*

- *SuperGlue: Component Programming with Object-oriented Signals*  
Sean McDirmid (Ecole Polytechnique Federale Lausanne, Switzerland);  
Wilson C. Hsieh (University of Utah, USA).
- *Ambient-oriented Programming in AmbientTalk*  
Jessie Dedecker, Tom Van Cutsem, Stijn Mostinckx, Theo D'Hondt, Wolfgang De Meuter (Vrije Universiteit Brussel, Belgium).
- *Responders: Language Support for Interactive Applications*  
Brian Chin, Todd Millstein (University of California, Los Angeles, USA).

**14:00 - 15:00 Type Theory I***Session Chair: William Cook (University of Texas at Austin, USA).*

- *Variance and Generalized Constraints for C# Generics*  
Andrew Kennedy, Claudio Russo (Microsoft Research Ltd, UK); Burak Emir (EPFL, Lausanne, Switzerland); Dachuan Yu (DoCoMo Communications Labs, USA).
- *A Semantic Analysis of C++ Templates*  
Jeremy Siek (Walid Taha, Rice University, USA).

**16:00 - 17:00 Type Theory II***Session Chair: Erik Ernst (Aarhus University, Denmark).*

- *Session Types for Object-Oriented Languages*  
Mariangiola Dezani-Ciancaglini (Universita di Torino, Italy); Dimitris Mostrous, Nobuko Yoshida, Sophia Drossopoulou (Imperial College London, UK).
- *Parameterized Modules for Classes and Extensible Functions*  
Keunwoo Lee, Craig Chambers (University of Washington, USA).

**Friday, July, 7th****Keynote****9:00 - 10:00***Session Chair: Jean Bézivin (University of Nantes, France)**The Closing of the Frontier**Ralph Johnson (University of Illinois, USA)***Technical Papers****10:30 - 12:00****Tools***Session Chair: Roel Wuyts (Université Libre de Bruxelles, Belgium).*

- *Augmenting Automatically Generated Unit-Test Suites with Regression Oracle Checking*  
Tao Xie (Department of Computer Science, North Carolina State University, USA).
- *Automated Detection of Refactorings in Evolving Components*  
Danny Dig, Can Comertoglu, Darko Marinov, Ralph Johnson (University of Illinois, USA).
- *Modeling Runtime Behavior in Framework-Based Applications*  
Nick Mitchell, Gary Sevitsky (IBM TJ Watson Research Center, USA);  
Harini Srinivasan (IBM Software Group, USA).

**13:00 - 14:30****Modularity***Session Chair: Erik Meijer (Microsoft, USA).*

- *Modular Software Upgrades for Distributed Systems*  
Sameer Ajmani (Google, Inc., USA); Barbara Liskov (MIT Computer Science and Artificial Intelligence Laboratory, USA); Liuba Shrira (Brandeis University Computer Science Department, USA).
- *Demeter Interfaces: Adaptive Programming without Surprises*  
Therapon Skotiniotis, Jeffrey Palm, Karl Lieberherr (Northeastern University, USA).
- *Managing the Evolution of Aspect-Oriented Software with Model-based Pointcuts*  
Andy Kellens (Vrije Universiteit Brussel, Belgium) Kim Mens (Université Catholique de Louvain, Belgium); Johan Brichau, Kris Gybels (Vrije Universiteit Brussel, Belgium).

**14:30 - 14:45****ECOOP 2006 Closing**

## – Posters

The poster display runs from Tuesday evening (during the Pays de la Loire council cocktail) until Friday. It will take place at the mezzanine. The posters will be presented during the Tuesday evening cocktail as well as during the Thursday afternoon coffee break.

- **P1** — *A Role-Based Implementation of Context-Dependent Communications Using Split Objects*

Jorge Vallejos, Peter Ebraert, Tom Van Cutsem, Stijn Mostinckx, Brecht Desmet, Pascal Costanza, Theo D'Hondt (*Vrije Universiteit Brussel*)

We focus on the context-awareness feature in the domain of pervasive computing. Our particular interest is to investigate how context information may influence the communication between software applications. We observe that the response of a message (the behaviour of the message's receiver) may not only depend on its own context, but also on the context of the message's sender. The problem is then how to model such a double influence of the context. We claim that a programming language that does not provide dedicated features to express the context of communications, inevitably leads to the problem of tangling context information with the functional behaviour of applications. We propose the use of a rolebased model to overcome this problem. An application is composed of roles representing its different context-dependent behaviours which are selected according to the context information of the communication. We describe an implementation of context-dependent roles based on split objects, which were presented by Bardou and Dony in their 1996 OOPSLA paper.

- **P2** — *Ambient References: Addressing Objects in Mobile Networks*  
Tom Van Cutsem (*Vrije Universiteit Brussel*)

A significant body of research in ubiquitous computing deals with mobile networks, i.e. networks of mobile devices interconnected by wireless communication links. Due to the very nature of such mobile networks, addressing and communicating with remote objects is significantly more difficult than in their fixed counterparts. This poster describes ambient references, a novel remote object referencing abstraction in the context of such mobile networks. Remote object references are one of the most fundamental programming abstractions of any distributed object-oriented programming language. The poster describes why novel referencing abstractions are needed and describes the benefits of ambient references over classic remote object references in mobile networks.

- **P3** — *Ambient-Oriented Exception Handling*  
Stijn Mostinckx (*Vrije Universiteit Brussel*)

Exception handling mechanisms are essential parts of current-day programming language because they provide a clean mechanism to separate the handling of exceptional events from default behaviour. In the context of mobile ad hoc networks, the increasing probability of exceptional events (such as disconnections, software mobility, changing environmental conditions) clearly necessitates the introduction of adequate support to handle exceptions. This poster presents a systematic analysis of the requirements for an exception handling mechanism for mobile ad hoc networks and outlines how these criteria can be mapped onto a set of easily implementable and reusable language constructs.

- **P4** — *Semi-Automatic Garbage Collection for Mobile Networks*  
Elisa Gonzalez Boix (*Vrije Universiteit Brussel*)

In the context of mobile networks, distributed garbage collection (DGC) must deal with volatile connections which may break remote references unexpectedly for an undetermined

amount of time. This poster discusses the new challenges that mobile networks pose to DGC and describes a new approach called semi-automatic garbage collection to cope with them. The rationale behind semi-automatic garbage collection is that automatic transparent DGC is irreconcilable with such highly partial disconnected network topology. We propose that the responsibility of DGC is shared among collector and developer in such a way that the collector is steered by the developer who has semantic knowledge of the object graph.

- P5 — *Codevo: Investigating and Visualizing Structures for Code Evolution*  
Henrik S. Hansen, Christoffer S. Hansen (*Aalborg University Esbjerg*)

Codevo is a system for tracking and visualizing software evolution. By collecting the motivation and intent behind version control commits, and by grouping changes in "low-level change" and "composite change" structures, Codevo makes semantically meaningless commits impossible. Composite changes are composed of low-level changes, and can be one of two types: "composite behavioral change" (altering the program behavior), or "composite refactoring" (changing the internal code structure, but not the behavior). The code evolution is visualized using views, which display both the object-oriented structural changes and their metadata.

- P6 — *Model Level Validation of Component Based Software for Distributed Embedded Systems*  
Dietmar Schreiner, Karl M. Göschka (*Vienna University of Technology*)

When building a component based application for distributed embedded systems, it's overall behavior depends not only on the contracts applying to the components and their interfaces, but even more so on explicit as well as implicit connectors emerging from component composition, deployment and interaction. Explicit connectors provide additional contracts on resource requirements and information channels. We contribute by showing how to perform model level validation of component and contract composition beyond simple interface matching. Moreover, we discuss a classification of typical component connectors to simplify application development for distributed embedded systems. This avoids the need of extensive knowledge of communication subsystems and the existence of any heavy weight middle-ware.

- P7 — *Tiny Devices Deserve Object Oriented Technologies*  
Fred Rivard (*Industrial Software Technology*)

There is a class of devices still programmed the "hard way", by use of languages such as C and Asm. Surprisingly, these devices are all around us: phones, cars, home appliances, toys, various controls and sensors, networks, music players, etc... At their heart, there is one of the nearly 10 billion microcontrollers released every year. But more than 85% of them (8bits, 16bits and low-end 32bits) lack the possibility to be programmed with high-productivity software languages, such as Java. This poster is about IceTea™, a new java-like language that embraces OOP on tiny devices that target deeply embedded or resource constrained applications. With a syntax à la Java, IceTea™ semantics are close to Java's, it has borrowed from C hardware interfaces and from assembly speed and code compacity. IceTea's aims to make it possible to create very small and fast programs with tight requirements using Java-like source code. A first implementation targets Atmel AVR microcontrollers.

- P8 — *A Systematic Method for the Detection and Correction of Design Defects*  
Naouel Moha, GEODES - Research Group on Open, Distributed Systems,  
Experimental Software Engineering (*University of Montreal*)

Design defects are poor design choices that lessen the quality of object-oriented architectures and impede their evolution and their maintenance. A good architecture without defects reduces significantly maintenance costs by easing comprehension and changes. However, the detection and correction of design defects are difficult because of the lack of precise

specifications and tools. Our goal is to provide a systematic method to specify design defects consistently and precisely and to generate detection and correction algorithms using refactorings from their specifications semi-automatically. We propose to apply and validate these algorithms on open-source object-oriented programs to show that our method allows the systematic description, detection, and correction of design defects with a reasonable precision.

- **P9** — *Ambient-Oriented Programming in AmbientTalk*  
Jessie Dedecker (*Computer Vrije Universiteit Brussel*)

A new field in distributed computing, called Ambient Intelligence, has emerged as a consequence of the increasing availability of wireless devices and the mobile networks they induce. Developing software for such mobile networks is extremely hard in conventional programming languages because of new distribution issues related to volatile network connections, dynamic network topologies and partial failures. This leads us to postulate a suite of characteristics of future Ambient-Oriented Programming languages. A simple reflective programming language, called AmbientTalk, that meets the characteristics is presented.

- **P10** — *SmPL: A Domain-Specific Language for Specifying Collateral Evolutions in Linux Device Drivers*  
Yoann Padioleau, Gilles Muller (*Ecole des Mines de Nantes / INRIA, LINA*)  
Julia L. Lawall, DIKU (*University of Copenhagen*)

Collateral evolutions are a pervasive problem in large-scale software development. Such evolutions occur when an evolution that affects the interface of a generic library entails modifications, i.e., collateral evolutions, in all library clients.

We have studied the collateral evolution problem in the context of Linux device drivers. Currently, collateral evolutions in Linux are mostly done manually using a text editor, or with tools such as sed. The large number of Linux drivers, and complexity of the collateral evolutions, however, implies that these approaches are time-consuming and unreliable, leading to subtle errors when modifications are not done consistently.

To address these problems, we propose a transformation language, SmPL, to specify collateral evolutions. Because Linux programmers are used to exchange, read, and manipulate program modifications in terms of patches, we have built our language around the idea and syntax of a patch, extending patches to Semantic Patches.

- **P11** — *ComDeCo (Composable Derivative Contracts)*  
Markus Reitz (*University of Kaiserslautern*)

The project ComDeCo aims at providing a component-oriented design and valuation framework for a wide range of derivative contracts. Based on the concept of an Active Document, the principle of thinking in components is transferred to the end-user domain. Because financial engineers often do not have in-depth software development expertise, easy composition techniques superseding low-level, inflexible, and error-prone state of the practice approaches have to be developed. Using ComDeCo's domain-specific framework, current as well as future types of contracts are designed and evaluated efficiently, providing a scalable solution for the problems of shortening product life and time to market cycles.

ComDeCo is an interdisciplinary joint work of the Financial Mathematics Group and the Software Technology Group at the University of Kaiserslautern and the Department of Financial Mathematics of Fraunhofer ITWM within the scope of the cluster of excellence DASMOD (<http://www.dasmod.de>) of Rhineland-Palatinate, Germany.

## – Demonstrations

Demonstrations will be played during the technical sessions, a first time on Wednesday and on Thursday (see below). Possibly we will organize a second round on Thursday in the evening or on Friday in the morning (have a look at the message board).

• **D1** — *Language Constructs for Context-oriented Programming - A Demonstration of ContextL*

**Wednesday, 10:30 - 11:00**

Pascal Costanza (*Vrije Universiteit Brussel*), Robert Hirschfeld (*Hasso-Plattner-Institut Potsdam*)

ContextL is one of our first programming language extensions that explicitly support Context-oriented Programming. In Context-oriented Programming, programs consist of partial class and method definitions that can be selected and composed at runtime as needed, encouraging continually adjusting behavior of programs according to their context of use.

The following examples are to motivate the need to provide code depending on its deployment and execution context.

- Mobile applications running on mobile devices might need to dynamically adjust their behavior according to the geographical context in which they are used.
- Mobile code typically depends on the context of the runtime environment in which it is executed, such as applets or software agents.
- Exploration environments create safe contexts in which to execute applications and can considerably help users to learn how to use them.

With contemporary mainstream programming languages, the only way to introduce context-dependent behavior into a program is either by inserting if statements wherever necessary to check for the context in which a program is running, violating one of the fundamental principles of object-oriented programming, namely to avoid explicit conditionals for achieving polymorphic behavior, or else by factoring out the context-dependent behavior into separate objects that can be substituted according to specific contexts of use. Both approaches lead to unnecessarily complicated code that is hard to comprehend and even harder to maintain.

With Context-oriented Programming on the other hand, we can modularize context-dependent parts of a software system using partial class and method definitions which are organized within layers. Layers are composed into or out of the system depending on the context apparent during program execution. The basic concept of layers as partial program definitions has been suggested before, but with our approach we extend this idea by the notion of dynamically scoped layer activation, resulting in a viable approach for expressing context-dependent behavior.

In our demonstration of ContextL we will show and discuss the following.

- The basic language constructs for Context-oriented Programming.
- The development of comprehensive non-trivial examples.
- Implementation issues, especially with regard to retaining efficient method dispatch.
- Future work, including steps towards a notion of first-class contexts.

ContextL is used as a research platform, but has already been used in industrial settings as well. Activities concerning ContextL are carried out in an open-source project which is available at <http://common-lisp/project/closer>.

- **D2** — *Ambient-Oriented Programming in AmbientTalk: Combining mobile hardware with simplicity and expressiveness*

**Wednesday, 11:00 - 11:30**

Jessie Dedecker, Tom Van Cutsem, Stijn Mostinckx, Theo D'Hondt, Wolfgang De Meuter (*Vrije Universiteit Brussel*)

Software development for mobile devices (such as smart phones and PDAs) is given a new impetus with the advent of mobile networks. Mobile networks surround a mobile device equipped with wireless technology and are demarcated dynamically as users move about. They turn applications running on mobile devices from mere isolated programs into smart applications that can cooperate with their environment. As such, mobile networks comprise an important part of the hardware landscape of next-generation pervasive computing and Ambient Intelligence applications. To deal with the implications of these radically changing hardware characteristics on the software engineering level, we have proposed a new paradigm of computing named ambient-oriented programming the details of which are presented in the Languages technical track.

The demonstration showcases AmbientTalk, a first exemplar ambient-oriented programming language. In essence, AmbientTalk is a distributed object-oriented programming language. It is a small dynamic language the features of which are entirely geared towards developing software for mobile (ad hoc) networks. Concurrency and distribution are achieved via the use of active objects, akin to the well-known actor model. In the demo, we illustrate the language's design via the demonstration of an application running on a number of PDAs connected via a wireless network. We interleave the demonstration with slides illustrating code snippets from the source code of the application.

The goal of the demonstration is to show how programming in AmbientTalk significantly eases the conceptual burden of developing software for distributed systems where devices are mobile, where connections are volatile and intermittent and where communicating parties often have to be discovered spontaneously in the nearby environment. In order to show where expressiveness and simplicity are gained in comparison to other approaches, we discuss the mechanics of a number of dedicated ambient-oriented language constructs.

- **D3** — *Java and IceTea™ on 8bits AVR RISC microcontrollers using Eclipse*

**Wednesday, 11:30 - 12:00**

Fred Rivard (*IST, Industrial Software Technology, in collaboration with ATMEL*)

The purpose of the demo is to show full Object Oriented Programming on small 8-bits microcontrollers as a reality. In collaboration with Atmel, IST demonstrates Object Oriented software design for the ATMEL RISC AVR Core. OO software is designed on the Eclipse platform and target two 8-bit microcontrollers: AT90CAN128 and ATmega128. These two devices embed 8KB of data RAM and 128KB of Flash program memory and fit very well to embedded applications found in consumer, industrial, security, communications and automotive markets.

Demo's hardware involves a regular PC running Eclipse. The PC also features a CAN network node that sends music frames to a DVK90CAN development. Amongst others things, that board offers many LEDs, a buzzer and a serial port. A second development board that features Ethernet connectivity and a small LCD device is connected to the DVK90CAN board using the serial port. The DVK90CAN uses that second board to display titles of the streamed music. A full-featured Java virtual machine runs on the ATmega128. IceTea, a java-like language, runs on the AT90CAN128. During the demo it will be possible to modify software running on the two boards according to attendees' wishes. Through the use of Eclipse Plugins, both Java and IceTea romizers will be used in order to generate ROM images that will be downloaded directly to microcontroller Flash program memories. Doing so, attendees will be able to interact and manipulate OOP on small devices. The whole development cycle will also get involved through the use of traditional IDE features (breakpoints, interruptions, memory inspection, code browsing, etc. ).

Software basis of the demo consists of streaming music from a PC to another CAN node, buffering the music. Buffer's load is shown using LEDs while the music is played to the buzzer.

The music name is grabbed from the music stream, and sent through the serial port. On the other end of the serial connection, a java program (running on top of a jvm) listens through an opened `SerialInputStream` for data to be received. Once the music title is received, it is displayed to the LDC display using the library `Display` class APIs.

• **D4** — *Acceleo: Eclipse and EMF template based system for MDA generation*  
**Wednesday, 14:00 - 14:30**

Etienne Juliot, Stéphane Lacrampe (*Obeo*)

Acceleo is an innovative and OpenSource MDA (Model Driven Architecture) code generator, based on eclipse and EMF (Eclipse Modeling Framework). It has been designed to improve software development productivity, durability and agility, but also to make MDA easier to learn and use.

It makes it possible for architects and developers to embed complex and powerful architecture patterns in generators and apply them automatically to functional models. Acceleo is used in the context of the Y development cycle, for gathering the left (functional) and right (technical) parts of the Y altogether to produce automatically application code. Designers can concentrate on high level design models and architects can link efficiently these models with the development phase.

This presentation will demonstrate Acceleo features and how it is used in the context of a real MDA project. A focus will be made on traceability, which deals with synchronisation between models and generated code, one of the main concerns when moving to a model centric approach.

The demo of Acceleo includes the following topics:

- How to make high level models using UML2 or a DSL modeler based on GMF
- How to generate code massively from a PIM to a standard JEE application using Acceleo's chains
- How to design an Acceleo template and use the reflective editor to tune it
- How Acceleo can deal with iterative development process
- How model/code traceability is used to ease developers work, to ensure quality and to implement a perfect

integration of the MDA approach within projects in the long run

This presentation will give the audience an illustration of how to use MDA and Acceleo with efficiency and pragmatism. It will try to bring a concrete answer to the question: how to solve the numerous challenges encountered when using a model centric approach in real projects ? Acceleo is freely available on <http://www.acceleo.org> with documentation, examples and quickstart.

• **D5** — *OSGi Component Programming*  
**Wednesday, 14:30 - 15:00**

Peter Kriens (*OSGi Alliance*)

Eclipse vividly demonstrates the success of component oriented programming because it is based upon a large set of plug-ins that collaborate to deliver the user experience. Not so well known is that the base that enables this collaboration model is very lean, flexible, managed and standardized: It is an instance of the Service Platform as specified by the OSGi Alliance. There are over 12 certified frameworks in the market, three open source (Eclipse Equinox, Knopflerfish, and Apache Felix), and numerous private implementations. The OSGi Service Platform provides an excellent platform for extendable applications that increase flexibility and reduce maintenance cost. OSGi is being adopted in many different designs, from embedded to mobile to enterprise applications.

This demonstration will show you hands-on how to develop applications based on OSGi bundles (plug-ins are bundles). We will start with a simple "Hello World" application that

highlights the modularity and life cycle features. This application is then further developed into a web based application that uses services from other bundles, as well as providing services to other bundles. We will show you what is under the covers as well as how Eclipse keeps any complexity under those covers. After this demonstration you will be able to write better, more flexible, more standalone, and more dynamic bundles that can be deployed in any OSGi service platform (Eclipse's Equinox or others).

• **D6** — *A programming environment for the development of modular 3D biomedical image processing applications*

**Wednesday, 15:00 - 15:30**

Alice Villéger, Julien Montagner, Jean-Yves Boire (*Faculté de Médecine, Clermont-Ferrand*) Frédéric Flouvat (*LIMOS, Aubière*)

ImageLib is a free object-oriented development environment dedicated to biomedical image processing. The software package contains a graphical MDI (kernel) to display and handle biomedical images, a programming library (C++ language) to develop new image processing components (plugins) and a rapid prototyping wizard (AutoLib), to simplify the plugin creation process.

The major interest (and originality) of these tools is to provide a framework for creating versatile, user-friendly, modular applications. Users with no programming knowledge can simply use the kernel GUI and import specific existing plugins to process biomedical images according to their needs, while users with basic C++ knowledge can quickly start to develop, test and share advanced image processing methods within the same environment. No specific object-oriented nor graphical programming skills are required.

The programming library provides all the necessary wrapping material (e.g. generic structures based on C++ templates) to develop (and/or import) any kind of image processing methods and manage advanced user interactions. User-written components such as processing functions and image read/write facilities (loaders) are compiled independently as DLLs ; at runtime, the resulting plugin objects are dynamically imported into the kernel environment, which manages all the graphical aspects of 2D/3D image handling (e.g. OpenGL). As a rapid prototyping application, AutoLib provides a simple GUI which automatically generates the appropriate base code to handle communications between a plugin DLL and the kernel interface.

Initially proposed to support the conception of image processing functions, ImageLib specifications have evolved (and are still evolving) to accommodate the needs of a growing number of various users. ImageLib is commonly used by our research team as a shared development environment. Thanks to its open, component-oriented architecture, it has also become a major collaboration tool with our research, biomedical, and industrial partners. Though initially designed to handle biomedical images, ImageLib is generic enough to be used as a framework for general image processing, be it in for research or education purpose.

Developed with Borland C++Builder 6.0 Tested under Windows 2000 and Windows XP  
Available for download on <http://www.u-clermont1.fr/erim/>

• **D7** — *The Silver Extensible Java Compiler and Modular Language Extensions*

**Thursday, 13:30 - 14:00**

Eric Van Wyk, Derek Bodin, Lijesh Krishnan, Phil Russell (*University of Minnesota*)

An extensible compiler can easily be extended with a collection of domain-specific language features to define an extended language that raises the level of abstraction to that of a particular problem, even when the problem crosses multiple domains. Such languages have the potential to improve the software development process and software quality by reducing the semantic gap between the programmer's high-level understanding of the problem and the relatively low-level language in which problem solutions are encoded.

In this demonstration of the Silver extensible Java compiler, we show how programmers can create new domain-adapted languages by importing a set of domain-specific language extensions into their extensible host language compiler. The attribute grammar-based extensible compiler framework supports the development of extensions that have two

important characteristics. First, language extensions should be complete in that they are as well-developed as host language features and fit seamlessly into the host language. Besides defining the syntax of new language constructs, extensions also define the semantic analyses and optimizing transformations of the new constructs. One aspect of semantic analysis is error checking; extensions should report useful error messages when they are used incorrectly. Second, extensions should be modular so that a programmer can extend the Java host language compiler by selecting a set of previously defined language extensions without needing any implementation-level knowledge of the extensions. Thus we make a distinction between a domain-expert feature designer who implements a language extension and a programmer who uses it by importing it into his or her host language. Several extensions will be demonstrated. One embeds SQL into Java so that natural syntax and compile-time syntax and type checking can be used for SQL queries. Another introduces condition tables from synchronous languages like RSML-e and SCR. These present complex boolean conditions in an easy-to-read tabular format. A third extension facilitates the writing of computational geometry programs via efficient unbounded integer types and symbolic perturbation to handle data degeneracies and improve program robustness. We also demonstrate general purpose language extensions, for example, one adds algebraic data types and pattern matching constructs similar to those in Pizza. All of these extensions are modular and can be imported together into the Java host language compiler. All prototypes are available at <http://www.melt.cs.umn.edu>.

• **D8** — *Latest News from Squeak: the Open-Source Smalltalk*  
**Thursday, 15:00 - 15:30**

Stephane Ducasse (*University of Savoie*)

Squeak, <http://www.squeak.org/>, is an open-source Smalltalk with strong multimedia facilities. After a really brief introduction, this demo will present the latest advances in Squeak using the new version 3.9 which contains a new compiler, new browser frameworks, new package system, a service mechanism, the traits implementation. We will present also Sophie a multimedia open-source frameworks <http://www.futureofthebook.org/sophie/>, Seaside <http://www.seaside.st/>, Croquet <http://www.croquet.org> and Spoon a new micro kernel for Squeak <http://www.netjam.org/spoon/>. We will present also the latest exciting news about the license.

• **D9** — *AJATO: an AspectJ Assessment Tool*  
**Thursday, 16:00 - 16:30**

Eduardo Figueiredo, Carlos Lucena (*PUC-Rio*) Alessandro Garcia (*Lancaster University*)

Aspect-oriented (AO) software development is an emerging paradigm that provides new mechanisms to support the modularization of concerns, which otherwise would crosscut the OO system decomposition. However, the accurate identification of concerns to be aspectized is far from being trivial, and it requires a systematic design assessment and reasoning about multiple modularity principles. Even the aspectization of certain tangled and scattered concerns can negatively affect fundamental software attributes, such as coupling, cohesion, and conciseness. In this context, this demonstration presents an assessment tool, called AJATO, to support the quantitative assessment of AO software artefacts. The goals of the tool are: (i) to compute existing AO metrics, and (ii) to support the application of a heuristics suite.

Most of the AO metrics available in our tool are based on traditional metrics, such as lines of code, and on extensions of those widely used with object-oriented design, such as the Chidamber and Kemerer metrics. Besides, the metrics suite also encompasses new metrics for measuring separation of concerns. Some of the metrics available in AJATO are Concern Diffusion over Components (CDC), Number of Attributes per Concern (NOAconcern), Number of Operations per Concern (NOOconcern), Vocabulary Size (VS), Number of Attributes (NOA), and Number of Operations (NOO).

In addition to the metrics, our assessment tool also implements some heuristics rules in order to automate some modularity analysis about the numbers. For example, the set of heuristics provides contextual information on how the realization of a given concern satisfies other soft-

ware engineering attributes, such as coupling, cohesion, and size. It also supports the automatic generation of warnings when certain design principles are violated. We present below some of these rules associated to separation of concerns.

```
R01 : IF CDC / VS of CONCERN is high
      THEN CONCERN is a HIGHLY SCATTERED CONCERN
R02 : IF (NOAconcern / NOA is low) and (NOOconcern / NOO
      is low) for at least one component with HIGHLY
      SCATTERED CONCERN
      THEN HIGHLY SCATTERED CONCERN is a CROSSCUTTING
      CONCERN
```

The investigated heuristics have been derived from our long-term experience on assessing aspect-oriented design and implementation. AJATO also supports the association of application-specific thresholds with the metrics and heuristics.

- **D10** — *Correcting a Buffer Overflow Vulnerability at Runtime with Arachne*  
**Thursday, 16:30 - 17:00**

Nicolas Lorient, Jean-Marc Menaud (*École des Mines de Nantes / INRIA, LINA*)

Arachne is an aspect-oriented system for C applications. It features a general purpose aspect language, and a runtime aspect weaver for C applications on x86/Linux architectures. Arachne has been built to pragmatically explore the advantages and drawbacks of Aspect-Oriented solutions to software evolution issues on "on production" applications. Arachne has already been applied to correct a security issue in wu-ftpd, to extend the Squid web cache with a prefetching policy and to adapt a medical image software.

This demonstration shows Arachne correcting a buffer overflow vulnerability in an echo server. While buffer overflow is a well known vulnerability, it still accounts for more than 50% of the vulnerabilities reported in open source code in 2005. During the demo, we first demonstrate how to exploit a buffer overflow vulnerability to open a remote console with root privileges. To correct the vulnerability without stopping the server, we write an aspect to replace the vulnerable code by a safe one. Finally, we use Arachne to dynamically inject that aspect into the running server without downtime nor sensible slowdown.

## – *Exhibit*

During the whole conference, you will have the opportunity to visit a few stands on the *mezzanine*. Will be represented from Tuesday until Friday.

- The ECOOP 2006 organizers,
- The ECOOP 2006 sponsors,
- The ECOOP 2006 booksellers: Springer-Verlag and Thomson-Gale.

## – *Birds of a Feather Sessions*

For those who wish to, we will try to provide facilities for impromptu "Birds of a Feather" (BoF) sessions.

BoFs can be used to go on a discussion that began during a workshop, a paper or a demonstration, as a way for a group to pursue a common interest.

BoFs can be "open" or "closed". Open BoFs have an open-door policy, and all ECOOP participants are welcome. Closed BoFs are private meetings.

Some rooms will be available, mainly between 17:30 and 19:00. For a larger time, please let us know your needs as soon as possible, and we will try to find a solution.

Don't forget to leave a notice advertising your BoF on the BoF board in the *mezzanine*.

## EVENINGS SOCIAL ACTIVITIES

ECOOP 2006 is happy to invite you at many different social events, beginning with the Welcome party and ending with the Banquet.

Social Events ECOOP 06				
	Monday	Tuesday	Wednesday	Thursday
	<b>Welcome Party</b>	<b>Poster Party</b>	<b>Civic Reception</b>	<b>Banquet</b>
Time	18:30 - 20:00	18:30-20:00	18:30 - 20:00	18:00 - 23:30
Venue	Le Lieu Unique	Convention Center	Musée des Beaux Arts	Château de la Poterie
Transportation	2 mn by foot		10 mn by foot	boat and bus

### Monday 18:30: Welcome Party

The ECOOP Welcome Party sponsored by Microsoft will take place in Le Lieu Unique from 18:30 to 20:00. A wine & cheese buffet will be served, that will give you the opportunity to taste some of our famous French specialities.

### Tuesday 18:30: Poster Party

The Pays de Loire Council invites you to a cocktail where the ECOOP 2006 posters will be presented by their authors.

### Wednesday 18:30: Civic Reception

The City of Nantes invites you to a Civic Reception that will be held in the beautiful Musée des Beaux Arts.

After the reception, you will be offered to stay for a guided visit of the museum.

To reach the museum, the easiest way is... to walk ! As it is only 10 minutes walk from the Convention Centre, and within walking distance from the city centre hotels.

### Thursday 18:00: Conference Banquet

ECOOP 2006 invites you to join us at the Conference Banquet at the Château de la Poterie, one of the charming "follies" situated on the banks of the Erdre River, maybe the "most beautiful river in France" ?

You will have the opportunity to judge by yourself, as we have planned to take you there by boat. The journey back to the town centre will be made by bus.

Catering arrangements: dinner and drinks with the meal are provided.



## CATERING ARRANGEMENTS

Please let us now as soon as possible if you have any special enquiries about food (allergies, diabetes, salt-free diet...). We'll try to make our best to inform our caterers about your needs.

### Breakfast

Breakfast is provided in the hotels, and is therefore not provided in the Convention Centre.

### Coffee Breaks and Lunch

Coffee Breaks will be provided all week long in the *Mezzanine*. This same area will also host the poster exhibition. They will be served from 10:30 to 11:00 on mornings and from 15:30 to 16:00 in the afternoons.

From Monday to Friday, lunches will be served in the Convention Centre, in the open space next to the *Mezzanine*, on the *Upper Foyer* floor.

Please note that there **will not be** any additional catering facilities in the Convention Centre, but you can find what you need around the Centre.

### Food in the Evenings

The evening dining program is explained above. Depending on the registration pack you chose, you may take part to the banquet organised on Thursday evening in le "Château de la Poterie".

Anyway, apart from all the Social Events, we hope you will enjoy our gastronomy, as Nantes is full of nice restaurants. Lots of them are located in the "Bouffay" and "Decré" quarters, which are within walking distance from the Convention Centre. Ask the student volunteers for directions.

## ABOUT THE VENUES

### About Nantes International Convention Centre

The Cité des Congrès of Nantes was created by the architect Yves Lion and Associates in 1992. Elegance and sobriety are its main characteristics, with its wooden floors and huge windows... Past and future are combining themselves to create a sensation of space, light and comfort.

The Cité des Congrès is now famous worldwide thanks to the "Folle Journée", a cultural event dedicated to a classical music composer or group of composers that lasts for 5 days every year at the end of January. The idea of the "Folle Journée", created in 1995 by René Martin is to reach a large audience, thanks to an unusual proposition: the concerts, lasting for 1 hour, begin around 9 AM and finish at 10:30 PM. They are given everywhere in the Convention Centre: either little rooms or large auditorium, and even sometimes in the Great Hall itself ! This is an unique occasion for the audience and the musicians to meet, and, added to very interesting prices, this may be the key of the success of "the Folle Journée".

### About the Musée des Beaux Arts

The Nantes Fine Arts Museum is built around a square inner courtyard, which has natural lighting. This museum houses a great collection of European paintings starting from the 13th century. Italian, Flemish and French schools are widely represented in its collection. Three paintings of Georges de la Tour, *portrait of Madame Senonnes* by Ingres, and *The wheat sifters* by Courbet are a few examples to judge the museums collection. You can also admire Monet, Kandinsky, Max Ernst, and Gerhard Richter and there is a lot more. Many interesting temporary exhibitions are organized here. Kandinsky and Turner were recent themes. The museum's collection is chronologically divided into Ancient art, XIX century, Modern art and Contemporary art. This museum building, opened in 1900, was designed by Clément-Marie Josso and reflects the eclectic approach of this period.

### About the Château de la Poterie

Built at the end of the 18th Century, probably designed by the famous architect Ceineray, la Poterie is one of the nicest castles located on the banks of the Erdre River. When property of one of Nantes deputy, it became a main place for hunting. As a reminder, a special breed of dogs created in the castle still exists.

Nested between the river and the woods, it now offers a perfect place for receptions, with its large lounges, its big fireplaces made out of Loire stones, and its furniture, typical of the "Louis XIII" style.

## ABOUT NANTES

### Architecture

The castle was started in 1466, and completed by Duchess Anne, whose statue stands at the drawbridge entrance. Its severe ramparts hide a sumptuous white limestone palace, a forerunner of the sophistication of the Renaissance.

A few steps away, the Gothic Cathedral holds the amazing black and white marble tomb of the parents of Anne of Brittany, ornamented with allegorical statues. The meaning of one of them, with the faces of an old man and a young woman, remains a mystery. Near the castle, the medieval quarter of Bouffay has retained all its charm. Its façades with their wooden wall sections, half-timbering and corbels, some going back to the 15th Century, will carry you back in time.

The 18th Century was the golden era for the people of Nantes, thanks to the development of the trade with the colonies. The richest ship owners built on the "île Feydeau", where you can see their fine freestone façades trimmed with ironwork and ornamented with figureheads. That golden age of the Siècle des Lumières can also be seen at the place Graslin, which was designed in a semi-circle like an amphitheatre, and the place Royale, where the statue of Nantes dominating the Loire and its tributaries stands.

The heritage of Nantes has treasures from every century. The 19th Century was the century for "follies". The best known are the magnificent passage Pommeraye, combining neoclassical style with a sumptuous décor, and La Cigale, without a doubt the finest brasserie in the world in the 1900 style. The LU Tower and the Titan Crane are reminders of industrial dynamism and the era of the first naval shipyards. The Chantenay quarter, its Butte Ste-Anne and the delightful "guinguettes" of Trentemoult are eternal reminders of this period.

The urban landscape is daring in its contemporary design. Le Corbusier made his mark with the imposing Cité radieuse at Rezé. The newly-built Nouveau Palais de Justice by Jean Nouvel triggers the metamorphosis of the Ile de Nantes into a new modern centre for the conurbation.

### History

Currency of Nantes:

Formerly: *Oculi omnium in te sperant domine*

"Eyes of all turn with hope to you Lord "

Since the revolution: *Neptunus favet eunti*

"Neptune smiles to those that dare"

Badges of Nantes:

Green sea - gilded boat -  
sails of ermines - red bot-  
tom - white summit ermine.



The Namnates settled along the north shore of the Loire River at the beginning of the first millennium, and gave their name to the city of Nantes. They were a Celtic tribe, one of the five tribes of Brittany, the Celtic province in the west of France. The Pictons, from Latin origin, remained on the south shore of the Loire.

Nordic invaders attacked the city in 843 and killed the bishop in his cathedral. The Normands stayed for a century until Alain Barbe Torte came back from England and defeated them. He became the Duke of Brittany and chose Nantes as its capital. Later, the Duke Francois II encouraged trade, and the city became the country's first port on the Atlantic coast during the Middle Ages. The Edict of Nantes, signed by Henri IV, guaranteed civil rights and freedom of religion to French Protestants.

In the 18th century, Nantes' port economy reached its peak thanks to trading activity with India. Then it became the most important centre for the slave trade. Ships were leaving Nantes with manufactured goods, bartered these for slaves in West Africa who were then sold in the West Indies for tropical products such as sugar, tobacco, coffee, cotton, and cocoa. It is at this time that the Dubigeon naval shipyards developed and remained a major factor in the economy of the city for the next two centuries.

In 1793 Nantes resisted the attacks of the Vendéens who were rebelling against the French Revolution. The traders of the city, supportive of the Revolution, went as far as to drown anti-government suspects in the Loire River.

World War II took its toll on the city, when 48 innocent citizens (out of 50 initially chosen) were executed on what became the Place des 50 Otages, after a German colonel was killed in a coup attempt.

Greatly modified by an urban renewal plan that was adopted in 1920, Nantes was further altered and extended after having been partly destroyed in World War II. Arms of the river have been filled up and made into roads; the railway, which used to cut across the town, now runs largely underground; and the port has been extensively rebuilt. Under a national planning scheme, Nantes has been made a major economic development centre. In the late 20th century, road, air, and rail communications were being extended, and vast industrial zones were being built. The well-equipped port has more than 2 mi of quays, and the river has been dredged to allow access to larger vessels; it functions in close association with Saint-Nazaire, its out port (seaward terminal for deep-draft vessels).

The shipbuilding yards are important. The chemical (fertilizers, paint) and mechanical (rail and aircraft equipment) industries expanded during the 1970s. The traditional food industries (fruit preserves and baked goods) continue. The original university founded in 1460 was abolished during the French Revolution, but a new one was established in 1961.

Although the cathedral of Saint-Pierre was built over a period between the 15th and 20th centuries, it retains a Gothic unity. The imposing facade (1434-1508) has three finely sculptured doorways and two high towers. The cathedral, bombed during World War II, had been nearly completely restored in 1972 when a fire largely destroyed the roof. The magnificent Renaissance tomb of Francis II, duke of Brittany (ruled 1458-88), was luckily unharmed. This same Francis II had rebuilt the medieval castle in 1466. Viewed from without, it looks like a fort with crenulated towers, but the inner courtyard is a typical Renaissance palace. The Musée des Beaux-Arts has one of the most important and varied collections of paintings in France.

## Gastronomy

Thanks to its position between Loire River and the ocean, Nantes benefits from a profusion of quality products: freshwater and saltwater fish, salt and "fleur de sel" (this is a type of sea salt obtained by hand harvesting the "young" crystals that form on the surface of salt evaporation ponds), fruits and vegetables produced in the numerous truck gardens, and, of course, wine ! Among the specialities of the region, we can list: seafood, fleur de sel of Guérande and Guérande toffees, corn salad, and Muscadet (white wine).

Apart from these "natural" specialities, you must add those born of the cultural heritage of Nantes. Sugar and rum sent by the colonies helped creating candies like "berlingots" and "rigolette", cakes like "le gâteau nantais" or cocktails like "le nantillais". The list would not be complete without mentioning the famous biscuits of the LU and BN factories, born in Nantes in the XIXth Century: "Petit Lu", "Beurré Nantais", "Paille d'Or" and "Goûter BN".

## ADDITIONAL INFORMATIONS

### Bus, Tram, Train & Plane Information

#### Bus and Tram

Your CityPass provides you free access to buses and trams during the conference.

To access the public transit system, just hop in in any tram with your CityPass. You do not need to show your ticket to the tram driver and thus can come in and out from any door. Remember that queuing is not mandatory.

#### Train

The south entrance of the train station is 5 mn far (by foot) from the Convention Centre. To get there, turn right when leaving the Centre and reach the river "canal St Félix". Walk aside the Canal by the left; the train station is on the other bank. There are trains to Paris every hour.

#### Airport

Your CityPass allows you to take the special bus going to the airport. The journey to the airport lasts about 23 minutes, and there is a bus stop in front of the Cité des Congrès. Departures (Monday to Friday) from 7.35 AM to 21.05 PM: 5:35, 7:15, 7:35, 8:45, 9:40, 10:15, 11:05, 12:15, 12:45, 13:50, 14:55, 15:35, 16:05, 17:00, 18:15, 20:05, 21:05. For the Saturday and Sunday timetable, please come and see us at the information desk. If you want to take a taxi, we can help you ! The journey to the airport lasts for 30mn and costs around 20 €.

You will also find in your conference bag:

- a map of Nantes town centre
- a brochure presenting Nantes restaurants

If you have any questions, the Organisation Staff will be glad to help you.

### Health and Safety

#### Health Information

The French emergency telephone number is 15.

There are on-site first aid workers in all the conference venues, and a first-aid point in the Convention Centre. There is no on-site pharmacy. The closest is 5 minutes away (by foot) from the Convention Centre and is open from 10:00 to 19:00.

If you have any major allergy, don't forget to let us know about it. We will pass along the information to our caterers.

#### Fire Safety

All the venues have fire alarms and all fire exits are clearly indicated. In the event of an emergency please remain quiet and follow the instructions given by the venue staff or emergency services.

#### If you need to contact us

You can call the Convention Centre: 02 51 88 20 00, or, in case of emergency, you can join us on 06 07 53 46 40

## Language Problems

ECOOP 2006 takes place in France. French people speak a strange dialect called "french". Fortunately, the french language consists only of a few words which we list hereafter:

### A few words of french

#### *Every day*

bonjour	good morning
au revoir	bye bye
merci	thank you
s'il vous plaît	please
Sapristi !	great heavens !

#### *Restaurant, shopping*

la note	the bill
TTC	taxes included

Note: the tip is left at your own appreciation.

#### *Traveling*

la correspondance	connexion
le quai	platform
toutes destinations	all destinations
la douane	customs
PAF	air & borders police
TAN	Nantes bus company
arrêt de tram	tram station
arrêt de bus	bus station
gare (gare SNCF)	train station
Cité des Congrès	Conference Centre

## Student Volunteers

This year, 26 Student Volunteers coming from all over the planet have accepted to bring their help for Ecoop06: 11 come from Nantes, 6 from France, 5 from Europe and 4 from even further away ! You will easily recognize them thanks to their red Tshirts. At any time, feel free to contact the Student Volunteer in the venue or during the social events for any questions or comments. They will do all their best to help you. They will also know the best places to go and can give you tips and tricks to enjoy your conference and your stay even more.

First Names	Last Names	Institutions	Countries
Ali	Assaf	LINA, Nantes	France
Angel	Nuñez	LINA, Nantes	France
Cenk	Atlig	Edirne	Turkey
Darren	Willis	University of Wellington	New Zealand
Florian	Minjat	LINA, Nantes	France
Ghislain	Atemezing	University of Yaoundé	Cameroun
Ha	Nguyen	LINA, Nantes	France
Jacqueline	McQuillan	National University of Ireland	Eire
Jérémy	Buisson	IRISA, Rennes	France
Jihene	Rezgui	University of Montreal	Canada
Jorge	Manjarrez	LINA, Nantes	France
Jorge	Quiané-Ruiz	LINA, Nantes	France
Laszlo	Szathmary	LORIA, Nancy	France
Laurent	Burgy	LaBRI, Bordeaux	France
Luis	Daniel Benavides Navarro	LINA, Nantes	France
Marcos	Didonet Del Fabro	LINA, Nantes	France
Mary	Felkin	LRI, Orsay	France
Meriem	Belguidoum	ENST-bretagne, Brest	France
Naouel	Moha	LIFL Lille & University of Montreal	France
Philipp	Ruemmer	Chalmers University of Technology	Sweden
Sebastian	Pavel	LINA, Nantes	France
Sergio	Castro	Vrije Universiteit Brussel	Belgique
Simon	Denier	LINA, Nantes	France
Simplice	Djoko Djoko	LINA, Nantes	France
Thomas	Fritz	University of British Columbia	Canada
Tomasz	Lukasiewicz	Wroclaw University of Technology	Poland

## ECOOP 2006 Committee Membership

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Jean Bézivin	.....UN-LINA, INRIA	..... <b>Organizing Chairs</b>
Pierre Cointe	.....EMN-INRIA, LINA	

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Antoine Beugnard	.....ENST Bretagne	..... <b>Tutorial Chairs</b>
Thomas Ledoux	.....EMN-INRIA, LINA	
Didier Le Botlan	.....CNRS-EMN, LINA	..... <b>Webmaster and Registration Chair</b>
Christian Attiogbé	.....UN, LINA	..... <b>Local Arrangement Chair</b>
Gilles Muller	.....EMN-INRIA, LINA	..... <b>Sponsors and Industrial Relations</b>
Catherine de Charette	.....EMN	..... <b>Treasurer</b>
Olivier Roux	.....Ecole Centrale de Nantes, IRCCYN	..... <b>Publicity Chairs</b>
Nathalie Le Calvez	.....EMN	
Julien Cohen	.....Polytech'Nantes, LINA	..... <b>Poster and Demo Chairs</b>
Hervé Grall	.....EMN-INRIA, LINA	
Yann-Gaël Guéhéneuc	.....University of Montréal (Québec, Canada)	..... <b>Student Volunteer Chair</b>
Jean-François Perrot	.....University of Paris VI	..... <b>20th anniversary Chair</b>
Mircea Trofin	.....Dublin City University (Ireland)	..... <b>Doctoral Symposium Chair</b>

### Program Committee

Mehmet Aksit	.....University of Twente, Netherlands
Jonathan Aldrich	.....Carnegie Mellon University, USA
David F. Bacon	.....IBM Research, USA
Don Batory	.....University of Texas at Austin, USA
Françoise Baude	.....University of Nice Sophia-Antipolis, France
Andrew Black	.....Portland State University, USA
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Luca Cardelli	.....Microsoft Research, UK
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Shigeru Chiba	.....Tokyo Institute of Technology, Japan
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Erik Meijer	.....Microsoft, USA
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