Curriculum Vitæ

Last Name : Guéhéneuc

First Name : Yann-Gaël

Department : Département de Génie Informatique et Génie Logicielle (DGIGL)
Organisation : École Polytechnique de Montréal
C.P. 6079, succ. Centre-Ville
Montreal, Quebec, Canada
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Date : June 5, 2009

Signature :

Personal Information

Degrees:

- February 2009 : certificate of ethical formation from the Ministère de la Santé et des Services Sociaux, Quebec, Canada, modules 1, 3.1, and 3.2.
- June 2003: Ph.D. degree in software engineering from Université de Nantes, obtained at École des Mines de Nantes, France.
- October 1998: M.Sc. degree in computer science from Université de Nantes, France (in French: diplôme d'études approfondies en informatique).
- October 1998: Engineering degree from École des Mines de Nantes, France.
- July 1993: B.Sc. degree in mathematics and techniques from Lycée Livet, Nantes, France (in French: diplôme de baccalauréat en mathématiques et technique).

Professional Career:

- Since June 2008, associate professor at DGIGL, École Polytechnique de Montréal.
- Since May 2007, associate member of CIRRELT.
- From August 2003 to May 2008, assistant professor at DIRO, Univeristé de Montréal.

Other Titles:

- Engineer (registered to Quebec Engineering Order).

Prices:

- Featured article in *IEEE Transactions in Software Engineering* in June 2007: "Feature Location using Probabilistic Ranking of Methods based on Execution Scenarios and Information Retrieval".
- Best Paper Award at *IEEE International Conference on Program Comprehension* in June 2006.
- Best Paper Award at *IEEE International Conference on Software Maintenance* in September 2005.

Contents

Teaching

1. Courses

Number	Title	Organisation	Cycle	Session	Credits	Students
LOG4430	Advanced Software Architecture and Design	DGIGL, ÉPM	1^e	W09	3	23
LOG3900	Project of Evolution and Maintenance of a Software System	DGIGL, ÉPM	1^e	W09	3	32
LOG2410	Software Design *(Coordinator)*	DGIGL, ÉPM	1^e	W09	3	45
IFT2255	Software Engineering	DIRO, FAS	1^e	S08	3	36
IFT6310	Software Engineering	DIRO, FAS	2^{nd}	W08	4	8
IFT3912	Development, Maintenance of Software	DIRO, FAS	1^{st}	F07	3	24
IFT6251	Subjects in Software Engineering	DIRO, FAS	2^{nd}	F06	4	9
IFT3902	Development, Maintenance of Software	DIRO, FAS	1^{st}	F06	4	28
IFT3903	Software Quality and Metrics	DIRO, FAS	1^{st}	W06	4	18
IFT6251	Subjects in Software Engineering	DIRO, FAS	2^{nd}	F05	4	14
IFT3902	Development, Maintenance of Software	DIRO, FAS	1^{st}	F05	4	24
IFT2251	Software Engineering	DIRO, FAS	1^{st}	W05	4	33
IFT3902	Development, Maintenance of Software	DIRO, FAS	1^{st}	F04	4	30
IFT2251	Software Engineering	DIRO, FAS	1^{st}	W04	4	70
IFT3902	Development, Maintenance of Software	DIRO, FAS	1^{st}	F03	4	36
					15 courses	430

2. Supervision of Graduate Students

2.1. Post-doctorates and Research Associates

Name	Title	Cycle	Role	Start	End
Gerardo Cepeda	Assessment of the layouts of class diagrams	3^e	Supervisor	F08	F08
					1 research associate done
Simon Denier	Evolution and Aspectisation of Design Patterns	3^{rd}	Supervisor	F07	F08
					0 post-doctorate(s)/research associate(s) in progress 2 post-doctorates/research associates done

2.2. Ph.D. Theses

Name	Title	Level	Role	Start	End
Sahar Kayhani Kermanshahi		3^e	Co-supervisor with Giuliano Antoniol	F09	
Venera Arnaoudova		3^e	Co-supervisor with Giuliano Antoniol	F09	
Sahar Kayhani Kermanshahi		3^e	Co-supervisor with Giuliano Antoniol	F09	
Laleh Mousavi-Eshkevari		3^e	Co-supervisor with Giuliano Antoniol	F09	
Ferdaous Boughanmi		3^e	Co-supervisor with Giuliano Antoniol	F08	
Abdou Maiga		3^{rd}	Co-supervisor with Giuliano Antoniol (DGIGL)	F08	
Salima Hassaine	Application of Bio-informatic Algorithms to Software Evolution Analysis	3^{rd}	Co-supervisor with Sylvie Hamel (DIRO)	F07	
Foutse Khomh	Design Pattern-based Quality Models	3^{rd}	Supervisor	F06	

Naouel Moha	Classification, Detection, and Correction of Design Defects	3^{rd}	Co-supervisor with Laurence Duchien (LIFL, France)	S05	S08
				8 Ph.D. thesis(es) in progress 1 Ph.D. thesis done	

2.3. M.Sc. Theses

Name	Title	Level	Role	Strat	End
Marwen Abbes		2^{nd}	Co-supervisor with Giuliano Antoniol (DGIGL)	F08	
Gerardo Cepada	Study of UML Class Diagrams Understanding with Eye-tracker	2^{nd}	Supervisor	F07	S08
Wei Wu	Evolution of Software Systems	2^{nd}	Supervisor	F07	
François Charbonneau	Quantitative and Qualitative Study of Development Processes in the Gaming Industry	2^{nd}	Supervisor	F07	
Julien Tanteri	Software Evolution and Advanced Visualisation	2^{nd}	Supervisor	F07	
Mathieu Lemoine	Transformations and Evolution	2^{nd}	Supervisor	F07	
Paul Bertrand	A Java Geographical Component for Pocket-PC	2^{nd}	Supervisor	F06	S08
Yousra Tagmouti	Code Generation from Design Patterns for Hardware Systems	2^{nd}	Co-supervisor with El Mostpaha Aboulhamid (DIRO)	F06	W08
Norddin Habti	Static Analyses of the Composition Relationsip	2^{nd}	Co-supervisor with Stefan Monnier (DIRO)	W06	W08
Jean-Yves Guyomarc'h	A Quality Model for Aspect-oriented Programs	2^{nd}	Supervisor	F04	W06
Olivier Kaczor	Efficient Algorithms for Design Motif Identification	2^{nd}	Co-supervisor with Sylvie Hamel (DIRO)	F04	W06
Janice Ka-Yee Ng	Modelisation and Analysis of Behavioural Design Motifs	2^{nd}	Supervisor	F04	W08
Saliha Bouden	Non-behaviour Refactorings	2^{nd}	Supervisor	W04	F06
Samah Rached	Analysis of Program Behaviour using Adjacency Matrices	2^{nd}	Co-supervisor with Petko Valtchev (DIRO)	W04	S05
Khashayar Khosravi	Design-pattern based Quality Model	2^{nd}	Supervisor	F03	S05
				5 M.Sc. thesis(es) in progress 10 M.Sc. theses done	

2.4. B.Sc. Projects

Name	Title	Level	Role	Start	End
Diane Gnimadi	Evolution of design defects	1^{er}	Supervisor	F08	
Nelson Cabral	PtidejEclipse Connector	1^{st}	Supervisor	W08	W08
Pierre Benedicto	A C♯ Parser for Ptidej	1^{st}	Supervisor	W08	W08
Maëlle Saïag and Bastien Marivint	XMI Support and Hibernate in Ptidej	1^{st}	Supervisor	F07	F07
Feras Arabi	PalmBibDB	1^{st}	Supervisor	F07	F07
François Charbonneau	A Questionnaire on Development Processes in the Gaming Industry	1^{st}	Supervisor	W07	W07
Gulam Modelin	Eyetracker Experiments	1^{st}	Supervisor	W07	W07
Jad Karam	SOUL and Ptidej Comparison	1^{st}	Supervisor	W07	W07
Mathieu Lemoine	A Experimental Platform for the Perfect Ear	1^{st}	Co-supervisor with Patrick Bermudez (McGill, Canada)	W07	W07
Fatoumata Traoré	Identification of Micro-architectures similar to Design Defects	1^{st}	Supervisor	W07	W07
Mohamed Kahla (Boursier CRSNG)	Implantation of Sugiyama Algorithms in Ptidej	1^{st}	Supervisor	S06	S06
Nicola Grenon, Abdeljabar Hammodan, and Rafik Ouanouki	Identification of Micro-architectures similar to Design Motifs	1^{st}	Supervisor	S06	S06
David St Hilaire (Boursier CRSNG)	An Open-source Collection of Operation Research Algorithms	1^{st}	Co-supervisor with Jean-Yves Potvin (DIRO)	S06	S06
Amine Mohammed Harmamk and Laila el Badaoui	Identification of Micro-architectures similar to Design Motifs	1^{st}	Supervisor	W06	W06
Pierre Leduc and Julien Tanteri	Implantation of Micro-patrons in Ptidej	1^{st}	Supervisor	W06	W06
Mohammed Amine El Haimer and Najib Tajeddine	Semi-automated Detection of Design Defects	1^{st}	Supervisor	F05	F05
Mehdi Lahlou	Improving the User Interface of Ptidej and Integrating Multilingual Capabilities	1^{st}	Supervisor	S05	S05
Sébastien Boisclair, Vinh Thinh Le, and Joseph Vong	Identification of Micro-architectures similar to Design Motifs	1^{st}	Supervisor	S05	S05

Rida Bouchaib, Anouar Ben Daho, Boubkre El Allani, and Khalid Kandouli	An Open-source Collection of Operation Research Algorithms	1^{st}	Co-supervisor with Jean-Yves Potvin (DIRO)	W05	W05
Denise Getibo, Emmanuelle Orcel, Mehdi El Moutaouakkil, and Yves Bia Toe	Identification of Micro-architectures similar to Design Motifs	1^{st}	Supervisor	W05	W05
Lliv Dialine Nkouka Diamona	Identification of Micro-architectures similar to Design Defects	1^{st}	Supervisor	W05	W05
Antoine Tremblay	Kayak – A Multi-platforms C++ BitTorrent	1^{st}	Supervisor	F04	F04
Ward Flores and Sébastien Robidoux	A C/C++ Parser for PADL	1^{st}	Supervisor	S04	S04
Lulzim Laloshi and Driton Salihu	PTIDEJ in ECLIPSE	1^{st}	Supervisor	S04	S04
Salim Bensemmane, Iyadh Sidhom, and Fayçal Skhiri	JPTIDEJSOLVER: A Java Explanation-based Constraint Solver for Design Motif Identification	1^{st}	Supervisor	S04	S04
Nawfal Chraibi, Duc-Loc Huynh, and Janice Ka-Yee Ng	Identification of Micro-architectures similar to Design Patterns	1^{st}	Supervisor	S04	S04
Karim Larichi and Jean-Nicolas Malek	Representation of the Dynamic Aspects of Design Patterns	1^{st}	Supervisor	W04	W04
Marc-André Bois	A BIBTEX Extension to ECLIPSE	1^{st}	Supervisor	W04	W04
				1 project(s) in progress (1 students) 27 projects done (48 students)	

2.5. Trainees

Name	Title	Level	Role	Strat	End
Bertrand van den Plas	A Study of Design Pattern Understanding with Eye-tracker	2^{nd}	Supervisor	F08	F08
Alban Tiberghien	Implantation of a DSL for Specifying Design Defects	2^{nd}	Co-supervisor with Naouel Moha (DIRO)	S08	S08
Sébastien Jeanmart	A Study of Design Pattern Understanding with Eye-tracker	2^{nd}	Co-supervisor with Houari Sahraoui (DIRO)	F07	F07
Alban Tiberghien	Une comparaison d'outils de détection des défauts de conception	2^{nd}	Supervisor	S07	S07
Rabih Mustapha	A Recommender for Design Patterns	2^{nd}	Supervisor	S06	F06
Pierre Leduc (Boursier CRSNG)	Definition of a DSL for Design Defects	2^{nd}	Supervisor	S06	S06
Eddy Ghassan	Customisation of an E-Commerce Site	2^{nd}	Supervisor	W05	W05
Ilya Bibik	Documentation Standardisation Software Project	2^{nd}	Supervisor	S05	S05
Steeve Chantrel	An Environment to Convert Java Programs in Web Services	1^{st}	Co-supervisor with Julie Vachon (DIRO)	W04	W04
Farouk Zaidi	A Eclipse Plug-in to Compute Metrics	1^{st}	Co-supervisor with Houari Sahraoui (DIRO)	W04	S04
				0 traineeship(s) in progress 9 traineeships done	

3. Jurys

3.1. Ph.D. Theses

Name	Title	Level	Organisation	Role	Date
Abdelaal Mohamed Mostageer	LINC based Amplifier Architectures for Power Efficient Wireless Transmitters	3^e	DGIGL, ÉPM	Representative of the Director of the Graduate Studies	24/04/09
Usman Bhatti	Object Identification and Aspect Mining in Procedural Object-Oriented Code	3^{rd}	Université Paris-Sud, Orsay, France	Member of the jury	15/12/08
Edgardo Palza	A Referential of Unified Processes and Genetic Metric Repository for Critical Systems	3^{rd}	ETS, Montreal, Québec, Canada	Member of the jury	12/12/08
Laila Cheikhi	Empirical Study of the Relationships between ISO 9126 Quality Models using the ISBSG Repository and the Taguchi Method	3^{rd}	ETS, Montréal, Québec, Canada	Member of the jury	19/02/08
Ghazwa Malak	A Probabilistic Approach to Assess Web Application Quality	3^{rd}	DIRO, FAS	Member of the jury	29/11/07
Andy Kellens	Co-design and Co-evolution of Source Code and its Structural Regularities using Intensional Views	3^{rd}	VUB, Bruxelles, Belgique	Member of the jury	8/06/07
Emmanuel Blanchard	Motivation and Culture in E-Learning	3^{rd}	DIRO, FAS	Member of the jury	9/05/07
Salah Bouktif	Improving the Prediction of Software Quality by Combining Models	3^{rd}	DIRO, FAS	Member of the jury	23/06/05
Sarita Bassil	Applying Workflows Technology to Socio-technical Complex Problems	3^{rd}	DIRO, FAS	Member of the jury	22/02/05

Arnoldo Rodriguez Chaves	An Intelligent Help System to Support Teachers to Author Learning Session in Decision-making	3^{rd}	DIRO, FAS	Member of the jury	08/02/05
					10 Ph.D. thesis jurys

3.2. M.Sc. Theses

Name	Title	Level	Organisation	Role	Date
Zeina Awedikian	Automatic Data Generation for MC/DC Test Criterion using Metaheuristic Algorithms	2^e	DGIGL, ÉPM	Membre of the jury	28/04/09
Sihem Benzalis		2^e	DIRO, FAS	Membre of the jury	31/03/09
Jeanne D'Arc Uwatowenimana	Identification of Motifs in the Collaborative Writing in Wikis	2^{nd}	DIRO, FAS	Member of the jury	15/05/08
?		2^{nd}	DIRO, FAS	Member of the jury	28/04/08
?		2^{nd}	DIRO, FAS	Member of the jury	28/04/08
Sihem Benlizidia	Loresa: A Recommender for Teaching Objects based on Semantic Annotations	2^{nd}	DIRO, FAS	Member of the jury	31/03/08
Karim Dhambri	Visual Identification of Design Anomalies in Object-oriented Programs	2^{nd}	DIRO, FAS	Chair of the jury	19/02/08
Marie-Élise Cordeau	Improving the Spatial and Emotive Perception in an Interactive Virtual Environment by Managing Camera Views	2^{nd}	DIRO, FAS	Member of the jury	8/02/08
Fan Yang	Rule-based Quality Heuristics Formalization and Identification	2^{nd}	DIRO, FAS	Chair of the jury	17/10/07
Olga Trembach	Rewriting a Ticketing System	2^{nd}	DIRO, FAS	Member of the jury	16/10/07
Maxime Benoît-Gagné	A New Sort Algorithm by Transposition	2^{nd}	DIRO, FAS	Member of the jury	27/08/07
David Daboué	Using Web Technologies to Improve the Processes of Quebec Soccer League	2^{nd}	DIRO, FAS	Member of the jury	12/04/07
Xi Ning Zhu	Design and Implementation of an AI Portal	2^{nd}	DIRO, FAS	Member of the jury	12/04/07
Frédéric Bastien	Design of a Behavioural Model for Formal Verification	2^{nd}	DIRO, FAS	Member of the jury	24/01/07
Amal el Ouarari	A Pursuit Game in Non-reflexive Graphs	2^{nd}	DIRO, FAS	Chair of the jury	7/11/06

Guillaume Germain	Design of a Programming Language for Distributed Programs	2^{nd}	DIRO, FAS	Member of the jury	29/05/06
Ikbal Taleb	Quality in Web Services	2^{nd}	DIRO, FAS	Chair of the jury	24/04/06
Nicolas Bergeron	Generation of Normal and Illumination Maps in Digital Composition	2^{nd}	DIRO, FAS	Chair of the jury	01/05/06
Ai Thanh Ho	DiGiCam: A Need-based Recommander System	2^{nd}	DIRO, FAS	Member of the jury	15/02/06
Xiaoqing Zhu	Online Fundraising Campaign	2^{nd}	DIRO, FAS	Member of the jury	24/01/06
Badis Merdaoui	Queri: A Collaborative and Interactive Question–Answer System	2^{nd}	DIRO, FAS	Member of the jury	21/10/05
Eric Buist	Design and Implementation of a Library for the Simulation of Call Centers	2^{nd}	DIRO, FAS	Member of the jury	15/09/05
Kamal Yammine	Applying a Recommender for Pedagogical Resources using the Z39.50 Protocol	2^{nd}	DIRO, FAS	Member of the jury	20/05/05
Laila Cheikhi	Change Impact Analysis in Object-oriented Programs	2^{nd}	DIRO, FAS	Member of the jury	26/11/04
Rachida Elaroussi-Chentoufi	Exchange of B2B Documents	2^{nd}	DIRO, FAS	Member of the jury	22/09/04
Jean-François Saint Amour	Real-time Rendering of Fuzzy Shadows using Depth Buffers	2^{nd}	DIRO, FAS	Chair of the jury	21/09/04
Dongfeng Li	Nego: A Virtual Negotiation Market	2^{nd}	DIRO, FAS	Member of the jury	07/09/04
Song Zhang	Semantic Query Parsing in Classification of Harmonised System Code	2^{nd}	DIRO, FAS	Member of the jury	28/05/04
					28 M.Sc. thesis jurys

3.3. B.Sc. Tutorials

faculté-département, titre du travail, cycle,

3.4. Other

Name	Title	Level	Organisation	Role	Date
Kamel Ayari	Automatic Generation of Test Data for DO-178B/ED-12B using Search-based Software Engineering Techniques	3^e	DGIGL, ÉPM	Chair of the jury for the comprehensive exam	6/02/09
Segla Kpodjedo	Approximate Graph Matching and Applications in Software Engineering	3^{rd}	DGIGL	Chair of the jury for the comprehensive exam	
Dominic Letarte	Static Analysis for the Evaluation of Security in Evolving Programs	3^{rd}	DGIGL	Member of the jury for the comprehensive exam	24/04/08
Romain Pacanowski	Structures for Editing Lighting	3^{rd}	DIRO, FAS	Member of the jury for the comprehensive exam	13/09/07
James Lapalme	Building a "Top Down" Solution to Model/Simulate Hardware Systems with Software Engineering Technologies	3^{rd}	DIRO, FAS	Member of the jury for the comprehensive exam	29/08/06
Younés el Fakhar	Integrating Many Geographical Data Sources	3^{rd}	DIRO, FAS	Chair of the jury for the comprehensive exam	19/02/06

Amal Zouaq	Managing Expertise and Knowledge in Organisation	3^{rd}	DIRO, FAS	Member of the jury for the comprehensive exam	02/09/05
Ghazwa Malak	Models and Methods to Assess the Quality of Web Applications	3^{rd}	DIRO, FAS	Chair of the jury for the comprehensive exam	01/04/05
El Hachemi Alikacem	Assessing Quality using Design Defect Detection in Object-oriented Programs	3^{rd}	DIRO, FAS	Chair of the jury for the comprehensive exam	17/05/04
Mustapha Kamel Abdi	Change Impact Analysis	3^{rd}	DIRO, FAS	Member of the jury for the comprehensive exam	29/04/04
Thi Lan Ahn Dinh	Metamodel to Manage Models	3^{rd}	DIRO, FAS	Member of the jury for the comprehensive exam	18/12/03
					11 jurys

4. Teaching Methods

4.1. Teaching Material

4.2. Teaching Methods

When supervising students, I make sure that they work in teams and with the state-of-the-practice tools, which are used in the industry: IDE, such as Eclipse, version repository, such as CVS, test frameworks, such as JUnit, and so on.

I implemented semester-long team projects in the courses IFT2251/IFT2255 (Winter 2005 and Summer 2008), IFT3902/IFT3912 (Fall 2004, 2005, 2006, and 2007) and IFT3903 (Winter 2006) to show students a glimpse of the ways in which the industry work and related difficulties.

I implemented in the courses IFT6251 (Fall 2005, 2006, and Winter 2008) the writing of scientific articles, in teams of 2 to 4 students, to teach students about the rules and difficulties of working in teams, the different types of articles, and ethical rules.

4.3. Course Notes

- IFT2251/IFT2255 – "Software Engineering", I improved the notes prepared by my predecessor, Julie Vachon. I put on-line these course notes, the exercises and their corrections, the exams and their corrections. I prepared special classes on software quality and design patterns.
  (`www.iro.umontreal.ca/~pift2255`.)

- IFT3902 – "Development, Maintenance of Software", I rebuilt the course notes using the material from my predecessor, François Lustman. I put on-line these course notes, the exercises and their corrections, the exams and their corrections.
  (`www.iro.umontreal.ca/~pift3912`.)

- IFT3903 – "Software Quality and Metrics", I revised entirely the previous material from Houari Sahraoui. I added more than 50 new slides. I put on-line these course notes, the exercises and their corrections, the exams and their corrections.
  (`www.iro.umontreal.ca/~pift3903`.)

- IFT3912 – "Development, Maintenance of Software", I revised entirely the content of course IFT3902, changing its description, to present both the basics of project management and methods and techniques for maintenance. These methods and techniques give the students the necessary knowledge to be ready for work in the industry and to evolve in their careers. Indeed, maintenance work is often the first type of job given to a new employee and maintaining/evolving software systems is now the main duty of professional software engineers.
  (`www.iro.umontreal.ca/~pift3912`).

5. Teaching Improvement Activities

I participated to the following activities:

- Programme, "Initiation to Teaching Dynamics", CEFES, 2, 3 et 4 juin 2004.
- Discussion group, "How is my Class?" Formative Evalution of Class during the Semester, CEFES, 19 février 2004.

Thanks to these activities, since Winter 2004, I assess my classes in the middle of the semester to quickly correct any problems, if possible, and to improve the material and the method, next semester.

Research

6. Research Projects

6.1. Funded Research Projects

Software Engineering

Title	Agency	Program	Amount	Start	End
Software patterns and patterns of software	NSERC	Canada Research Chair Tier II	$500,000 ($100,000/year)	S09	H14
Constraint-based Methods to Verify Mixed Software–Hardware Systems	FQRNT	Team Project with Gilles Pesant (DGIGL)	$168,900 ($56,300/year)	S09	W12
A Tool to Evaluate the Architectural Quality	Université de Montréal	VINCI	$6,720	S07	W08
Understanding the Impacts of Software Design Patterns and Design Defects	NSERC	Discovery Grant	$135,000 ($27,000/year)	S07	W12
Application of Bio-informatic Algorithms to Study and Analyse Software Evolution	FQRNT	Team Project with Sylvie Hamel (DIRO)	$155,000 ($47 000/year + $14 000 for hardware)	S07	W10
REMOOS Associate Team	INRIA	Team Project with Stéphane Ducasse (INRIA Lille) and Oscar Nierstrasz (IAM, Bern)	$36,570	W08	F08
Metrics for the Visualisation, Assessment, and Re-engineering of Object-oriented Programs	SNCF (France)	Team Project with Houari Sahraoui (DIRO)	$112,000	S07	F09
Tools to Improve Architectural Maintainability of Object-oriented Programs	NSERC	Discovery Grant	$74,100 ($24,700/year)	S04	W07

A Laboratory for Experimental Software Engineering to Evaluate Online Static Analyses and Program Understanding Techniques that Support Program Maintenance and Development	CFI	Infrastructure Project with Stefan Monnier (DIRO)	$362,140	F05	W06
PTIDEJ, A Tool-suite to Assess and Improve Software Quality by Promoting the Uses of Patterns	Université de Montréal	Startup Funds	$30,000 ($20 000 + $10 000 for a bursary)	F03	W06
				0 submitted project(s)	
				8 funded projects for a total of $1,580,430	

Software Engineering Applications

Title	Agency	Program	Amount	Start	End
Assessment of a Virtual Intervention (Web Application) to Improve Anti-retroviral Intake	FRSQ	Research in Population Health with José Côté (Nursing Faculty)	$229,160 ($76,386/year)	S08	W11
Assessment of a Virtual Intervention (Web Application) to Help People living with HIV to Manage their Therapy	IRSC	Operation Funds with José Côté (Nursing Faculty)	$288,200	Submitted	
Efficacy of a Custom Intervention Program to Improve Anti-retroviral Intake	IRSC	Team Project with José Côté (Nursing Faculty)	$143,000 ($71,500/year)	S07	W09
Computer Support to Assess the Improvement to the Behaviour of People living with a long-term Disease	FRSQ	Team Project with José Côté (Nursing Faculty)	$15,000	F05	S06
				1 submitted project(s)	
				3 funded projects for a total of $675,360	

6.2. Travel Funds

Agency	Program	Amount	Start	End	
Naouel Moha's Ph.D. Defense	Crédits BQR – Internationalisation de la recherche, Université de Lille	Refund of Travel Costs to Montreal	$2,215	W08	S08
Detection and Correction of Design Defects	Foreign Affairs and International Trade Canada	Refund of Travel Costs to the WBT Showcase	$495	S07	S07
Towards a Domain-specific Language to Suggest Corrections to Design Defects	INRIA–FQRNT	Team Project with Laurence Duchien et Anne-Francoise Le Meur (INRIA Futurs ADAM)	$12,000 ($1 000/months + $850 for travel expenses)	F07	W08
Invited Professor	Égide	Team Project with Laurence Duchien et Anne-Francoise Le Meur (INRIA Futurs ADAM)	$4,400	W07	W07
				0 submitted project(s) 4 funded projects for a total of $19,110	

subventionnés

7. Significant Contributions

7.1. Design Pattern Identification

One of my most important contribution pertains to design pattern identification. Maintenance is difficult, even with higher-level models and features, because of lost design choices. Design pattern identification helps recover these lost choices. I set a landmark in the field with tools to model the structures of design patterns and to identify variants *similar* to these structures statically. The tools that I developed feature unique characteristics to highlight design choices: They automatically handle variations in the models [38 ; 37] and incomplete variants and explain their findings. They were also the first use of explanation-based constraint programming in software engineering [40]. They attracted the attention of many researchers, stirred up exchanges in many workshops. This work led to a publication in the IEEE Transactions on Software Engineering (TSE) [5], recognised as the best journal in software engineering. Then, I developed a novel technique based on data mining to improve the time and space efficiency of the identification [32 ; 30]. I also suggested a bridge with bio-informatics to allow identification in (very) large programs and developed a time- and space-efficient tool using a bit-vector algorithm [26] and the identification of behavioural and creational patterns [42]. I recently showed with colleagues that some roles are more prone to change than others, which could help make informed choices when designing and maintaining programs [11].

7.2. Reverse Engineering

I also contributed to the traceability between source code and higher-level models of programs, such as UML class diagrams, with definitions, algorithms, and tools to recover such models of programs. My tools are based on (1) precise definitions of binary class relationships and of their implementation [34 ; 35] and (2) a systematic study of the reverse engineering of several programming languages [31 ; 33]. This traceability is important during maintenance to allow working with more abstract and rich data than raw source code. This work fostered several collaborations and led to my co-organising the international ECOOP Workshop on Object-Oriented Reengineering series. This work is also led to contributions on trace requirements in source code [14] and on Prereqir, a new method to extract pre-requirements information from programs [12].

7.3. Code and Design Smell Detection

Higher-level models are also essential to assess the quality of program designs. Using my expertise on design pattern identification, I am working with a team of students on the detection of code and design smells, which are "opposite" to design patterns, *i.e.*, code and design smells embody "poor" implementation and design choices. Following the first published taxonomy of design smells [39], with then-Ph.D. student N. Moha, we proposed the first method to specify design smells systematically and detect them precisely and automatically [17 ; 18 ; 23 ; 24 ; 27]. This work also raised the interest of several companies to detect smells in their programs, ease their comprehension, and improve their maintainability.

7.4. Program Comprehension

There is a consensus on the usefulness of higher-level models, features, and design patterns to ease program comprehension during maintenance. Yet, few studies have assessed the *concrete* use of these pieces of information by maintainers. I therefore set up in 2004 a laboratory for experimental software engineering thanks to a CFI On-going New Opportunities grant. I developed a theory linking vision science and program comprehension [3 ; 69] and proposed the first study analysing with an eye-tracker the use of class diagrams by maintainers [22]. This preliminary work showed surprising results and was acclaimed for its originality. It yielded many fruitful discussions in the community and led to the hiring of a post-doctoral, S. Denier, student with whom we developed a model, metrics, and rules to understand class hierarchies based on the previous results [13].

7.5. Software Quality

The quality of programs or lack thereof has been shown to have an important impact on the costs of development and maintenance. My work on design pattern identification and code and design smell detection naturally led me and my team to further study the alleged relation between patterns, smells, and software quality. This study is leading to a better understanding of the impact of design patterns on quality characteristics [15 ; 44] and to the current development of a quality model taking into account the use of design patterns and–or the presence of smells. This work is being pursued with a Ph.D. student, F. Khomh, as part of his doctoral thesis.

7.6. Feature Identification

I developed the first 100%-pure Java tool to analyse on-the-fly Java programs [36]. This tool offers the advantage to develop sophisticated analyses of Java programs, *e.g.*, to help maintainers understand a program behaviour. I was the main proponent and developer of the tool while the co-authors assisted with its formal framework. Then, with Canada Research Chair holder G. Antoniol, we developed a novel technique to rank dynamic events and thus to identify features more precisely [29], for which we received the Best Paper award at the International Conference on Software Maintenance in 2005 and that we formalised with an epidemiological metaphor published in IEEE TSE [7]. This work led to further development using Latent Semantic Indexing to combine different techniques and thus improve their precision [25]. We received the Best Paper award at the International Conference on Program Comprehension in 2006 and expanded this work into an IEEE TSE journal article [6].

8. Publications

Students names are in bold. I always take an active part of the research work, software development, and writing of any article.

8.1. Books

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8.2. Book Chapters

[1] **Khashayar Khosravi** and Yann-Gaël Guéhéneuc. *On Issues with Software Quality Models*, chapter 11, pages 218–235. ICFAI University Press, January 2008. 28 pages. (NSERC grant 293213)

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8.5. Proceedings

[66] Serge Demeyer, Kim Mens, Roel Wuyts, Yann-Gaël Guéhéneuc, Andy Zaidman, Neil Walkinshaw, Ademar Aguiar, and Stéphane Ducasse, editors. *Report of the* 6^{th} *international Workshop on Object-Oriented Reengineering (WOOR)*. Springer-Verlag, July 2005. 12 pages.

8.6. Technical Reports

[67] Simon Denier, Foutse Khomh, and Yann-Gaël Guéhéneuc. Reverse-Engineering the Literature on Design Patterns and Reverse-Engineering. Technical report EPM-RT-2008-09, DGIGL, École Polytechnique Montréal, October 2008. 18 pages.

[68] **Foutse Khomh** and Yann-Gael Guéhéneuc. An Empirical Study of Design Patterns and Software Quality. Technical report 1315, University of Montreal, january 2008. 44 pages. (NSERC grant 293213)

[69] Yann-Gaël Guéhéneuc. A Theory of Program Comprehension – Joining Vision Science and Program Comprehension. Technical report 1267, University of Montreal, December 2005. 26 pages. (CFI project 10363)

[70] **Khashayar Khosravi** and Yann-Gaël Guéhéneuc. A Quality Model for Design Patterns. Technical report 1249, University of Montreal, September 2004. 94 pages. (NSERC grant 293213)

[71] Yann-Gaël Guéhéneuc. *Un cadre pour la traçabilité des motifs de conception*. Thèse de doctorat, École des Mines de Nantes et Université de Nantes, juin 2003. 350 pages. (Object Technology International, Inc. et IBM Eclipse Fellowship)

[72] Aline Lúcia Baroni, Yann-Gaël Guéhéneuc, and Hervé Albin-Amiot. Design Patterns Formalization. Technical report 03/03/INFO, Computer Science Department, École des Mines de Nantes, June 2003. 59 pages. (IBM Eclipse Fellowship)

[73] Yann-Gaël Guéhéneuc, Hervé Albin-Amiot, Rémi Douence, and Pierre Cointe. Bridging the Gap Between Modeling and Programming Languages. Technical report 02/09/INFO, Computer Science Department, École des Mines de Nantes, July 2002. 56 pages. (Object Technology International, Inc.)

[74] Yann-Gaël Guéhéneuc, Rémi Douence, and Narendra Jussien. No Java Without Caffeine – A Tool for Dynamic Analysis of Java Programs. Technical report 02/07/INFO, Computer Science Department, École des Mines de Nantes, May 2002. 16 pages. (Object Technology International, Inc.)

[75] Yann-Gaël Guéhéneuc. Syntax-error Recovery in Interactive Environments. Thèse de maîtrise, École des Mines de Nantes et Université de Nantes, septembre 1998. (Diplôme d'études approfondies).

8.7. Tool Demonstrations

[76] Naouel Moha and Yann-Gaël Guéhéneuc. PTIDEJ and DECOR: Identification of Design Patterns and Design Defects, February 2008. SATToSE: Seminar on Advanced Tools and Techniques for Software Evolution, Waulsort, Belgium.

[77] **Naouel Moha** and Yann-Gaël Guéhéneuc. PTIDEJ and DECOR: Identification of Design Patterns and Design Defects, November 2007. Tool demo at the 22^{nd} International Conference on Automated Software Engineering. (NSERC grant 293213)

[78] **Naouel Moha** and Yann-Gaël Guéhéneuc. PTIDEJ and DECOR: Identification of Design Patterns and Design Defects, October 2007. Tool demo at the 21^{st} International Conference on Object-Oriented Programming, Systems, Languages and Applications. (NSERC grant 293213)

[79] Yann-Gaël Guéhéneuc. PTIDEJ: A Flexible Reverse Engineering Tool Suite, October 2007. Tool demo at the 23^{rd} International Conference on Software Maintenance. (NSERC grant 293213)

[80] Yann-Gaël Guéhéneuc. PTIDEJ - A Tool Suite, May 2007. Tool demo at the 5^{th} World's Best Technologies Showcase. (NSERC grant 293213)

[81] Yann-Gaël Guéhéneuc. Design Pattern Identification in PTIDEJ, March 2007. Tool demo at GRASCOMP Graduate School in Computing Science 2007 (COMP013). (INRIA mobility grant)

[82] **Naouel Moha** and Yann-Gaël Guéhéneuc. DECOR and PTIDEJ, October 2006. Tool demo at the 16^{th} IBM Centers for Advanced Studies Conference. (NSERC grant 293213)

[83] Yann-Gaël Guéhéneuc, **Jean-Yves Guyomarc'h**, **Duc-Loc Huynh**, **Olivier Kaczor**, **Naouel Moha**, and **Samah Rached**. PTIDEJ - A Tool Suite, October 2005. Tool demo at the 15^{th} IBM Centers for Advanced Studies Conference. (NSERC grant 293213)

9. Software Systems

[84] Yann-Gaël Guéhéneuc. P-MART, since November 2004. A database of occurrences of patterns in object-oriented programs.

[85] Yann-Gaël Guéhéneuc. CAFFEINE, since May 2002. A tool to analyse Java programs dynamically.

[86] Yann-Gaël Guéhéneuc. PTIDEJ, since July 2001. A tool suite to evaluate and to enhance the quality of object-oriented programs.

[87] Yann-Gaël Guéhéneuc. PADL, since July 1999. A meta-model (and parsers) to represent and to manipulate object-oriented programs and design motifs.

Administrative Work

10. Organisation

10.1. Department, Faculty, or Research Center

- In charge of the 3^{rd} and 4^{th} years in software engineering at DGIGL, year 2008–2009.
- Chair of the Promotion Committee of DIRO, year 2006–2008.
- Chair of the Software Engineering Compulsory Exam Committee of DIRO, year 2006–2008.
- Member of the Promotion Committee of DIRO, year 2005–2006.
- Member of the Promotion Committee of DIRO, year 2004–2005.
- Member of the Compulsory Exam Committee of DIRO, year 2003–2004.

10.2. University

11. Other Administrative Duties

12. Negotiation Activities

Promotion of the University

13. Scientific and Professional Events

titre, date et lieu

13.1. Organisations

- Chair of the Organising Committee of the *Conférence sur les Architectures Logicielles* et *Langages et Modèles à Objets*, 2008, du 3/03/08 au 7/03/08.
- Co-founder and active membre of the *Montreal Software Analysis Research Talks*, 14/05/07.

Member of the Organising Committee of the:

- international conference *Working Conference on Reverse Engineering* (WCRE), 2009, in charge of the workshops.
- international conference *Information Security and Assurance*, 2008.
- international workshop *Qualitative Approaches in Object Oriented Software Engineering* at ECOOP, 2007.
- international workshop *Workshop on Object Oriented Reengineering* at ECOOP, 2007.
- international conference *European Conference on Object Oriented Programming* à ECOOP, 2006, Chair of the 27 Student Volunteers.
- international workshop *Qualitative Approaches in Object Oriented Software Engineering* at ECOOP, 2006.
- international workshop *Workshop on Object Oriented Reengineering* at ECOOP, 2006.
- international workshop *Design Pattern Detection for Re-engineering* at WCRE, 2006.
- international workshop *International Workshop on Design Pattern Theory and Practice*, at ICSM, 2005.

13.2. Program Committees

Member of the Editorial Board of the:

- international journal *The Open Software Engineering Journal*, 2009.
- international journal *International Journal of Software Engineering and its Applications*, 2007.

Member of the Program Committee of the:

- international workshop *International Workshop on International Workshop on Principles of Software Evolution/ERCIM Workshop on Software Evolution* (IWPSE/EVOL), 2009.
- international workshop *International Workshop on Data-intensive Software Management and Mining* at CIKM, 2009.
- international workshop *International Workshop on Software Patterns and Quality* at APSEC, 2008.
- international workshop *Workshop on Advanced Software Development Tools and Techniques* at ECOOP, 2008.
- international workshop *Mining Software Repositories*, 2008.
- international French-speaking conference *Langages et Modèles à Objets*, 2008.
- international conference *Information Security and Assurance*, 2008.
- international workshop *Workshop on FAMIX and Moose in Reengineering* at WCRE, 2008.
- international workshop *International Workshop on Software Patterns and Quality* at APSEC, 2007.
- international conference *Working Conference on Reverse Engineering* (WCRE), 2007, 2008.
- international conference *International Conference on Program Comprehension* (ICPC), 2007, 2008, 2009.
- international conference *International Conference on Software* (ICSOFT), 2007, 2008, 2009.
- international conference *International Conference on Software Maintenance* (ICSM), 2007, 2008, 2009.
- international workshop *International Workshop on Traceability in Emerging Forms of Software Engineering* at ICSM, 2009.
- international workshop *Tool Track* at CSMR, 2007.
- international workshop *Pattern Languages: Addressing the Challenges* at OOPLSA, 2007.
- international workshop *Building Systems Using Patterns* at OOPSLA, 2007.
- national conference *Journées Francophone sur le Développement de Logiciels Par Aspects*, 2007.
- national workshop *Qualité des Modèles de Conception*, 2007.
- national conference *Technologies de l'Information et de la Communication pour l'Enseignement*, 2006.

- international workshop *Workshop on Architecture Centric Evolution* at ECOOP, 2006.
- international workshop *Workshop on Quantitative-based Evaluation, Visualization, and Refactoring* at UML, 2004.
- international workshop *International Workshop on Advanced Software Development Tools and Techniques* at ECOOP, 2008.

13.3. Reviews

Reviewer for the:

- international journal *IEEE Transaction on Software Engineering* (TSE)
  - of 1 article in 2009.
  - of 2 article in 2008.
  - of 1 article in 2007.
  - of 1 article in 2006.
  - of 1 article in 2004.
- international journal *Journal of Automated Software Engineering* (JASE)
  - of 1 article in 2004.
  - of 1 article in 2003.
- international journal *Journal of Software Maintenance and Evolution* (JSME)
  - of 1 article in 2008.
  - of 1 article in 2007.
- international journal *Journal of Empirical Software and Systems* (JESS)
  - of 1 article in 2008.
  - of 1 article in 2006.
- international journal *Information and Software Technology* (IST)
  - of 1 article in 2007.
  - of 2 articles in 2006.
  - of 1 article in 2004.
- French-speaking international conference *Langages et Modèles à Objets* (LMO)
  - of 5 articles in 2008.
  - of 2 articles in 2007.
  - of 3 articles in 2006.

  - of 3 articles in 2005.
  - of 2 articles in 2004.
- international conference *Working Conference on Reverse Engineering* (WCRE)
  - of 5 articles in 2008.
  - of 7 articles in 2007.
- international conference *International Conference on Program Comprehension* (ICPC)
  - of 4 articles in 2008.
  - of 5 articles in 2007.
- international conference *International Conference on Software* (ICS)
  - of 3 articles in 2008.
  - of 3 articles in 2007.
- international conference *International Conference on Software Maintenance* (ICSM)
  - of 6 articles in 2008.
  - of 8 articles in 2007.
- 5 articles submitted to the international conference *International Conference on Quality Software* (QSIC), 2009.
- 1 article submitted to the international conference *European conference on patterns* (EuroPlop), 2009.
- 4 articles submitted to the *European Projects Track* at CSMR, 2009.
- 3 articles submitted to the international workshop *International Workshop on Advanced Software Development Tools and Techniques* at ECOOP, 2008.
- 1 article submitted to the international journal *IBM Journal of R&D*, 2008.
- 4 articles submitted to the international workshop *Mining Software Repositories* (MSR), 2008.
- 2 articles submitted to the international workshop *Software Patterns and Quality* at APSEC, 2007.
- 1 article submitted to the international conference *International Conference on Artificial Intelligence in Education*, 2007.
- 1 article submitted to the international conference *Model Driven Engineering Languages and Systems*, 2006.
- 2 articles submitted to the international workshop *Architecture-Centric Evolution* at ECOOP, 2006.

- 1 article submitted to the international conference *Principles and Practice of Declarative Programming* (PPDP), 2006.
- 3 articles submitted to the French-speaking international conference *Colloque Africain sur la Recherche en Informatique* (CARI), 2006.
- 3 articles submitted to the international workshop series *Software Technology and Engineering Practice* à ICSM, 2006.
- 2 chapter submitted for the book *Object-Oriented Design Knowledge: Principles, Heuristics, Best Practices*, 2005.
- 1 articles submitted to the international conference *International Symposium on Programming and Systems*, 2005.
- 2 articles submitted to the international workshop *International Workshop on Software Audits and Metrics* at ICEIS, 2004.
- 5 articles submitted to the international conference *Automated Software Engineering* (ASE), 2004.

13.4. Seminars

To be announced	Software Maintenance and Evolution Research Group, Concordia University
December 4, 2008	Department of Computer Science, Université du Québec à Montréal
November 17, 2008	Department of Computer Science, KAIST
October 2, 2008	DGIGL, École Polytechnique de Montréal
June 7, 2007	PROG, Vrije Universiteit Brussel
March 15, 2007	LIFL, Université des Sciences et Technologies de Lille
March 14, 2007	Institut d'informatique, Université de Mons-Hainaut
October 5, 2006	IBM Ottawa Software Lab.
September 5, 2006	Laboratoires Universitaires Bell
April 23, 2004	Department of Computer Science, Université du Québec à Montréal
April 1, 2004	DIRO, University of Montreal
March 25, 2003	SCG, Institute of Applied Mathematics, University of Bern
February 25, 2003	DIRO, University of Montreal
August 21, 2001	Object Technology International, Inc.

14. Other Services

- External referee for a "Networking and Technical Training" proposal to the MITACS network in 2009.
- External referee for two funding applications to NSERC, 2008.
- Student Activity Chair of Montreal IEEE Branch, year 2006–2007.
- Student Activity Chair of Montreal IEEE Branch, year 2005–2006.

- External referee for two funding applications to NSERC, 2005.
- Advisor to the Training Committee of the Undergraduate Association at DIRO, year 2004–2005.
- Student Activity Chair of Montreal IEEE Branch, year 2004–2005.