

Etienne Borde

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Date of birth : 05th October 1982

Research field: Model-Driven Engineering for Critical, Real-time, and Embedded Systems

Education

2006-2009 : Ph.D student : software engineering for critical embedded systems, in partnership with *TelecomParisTech* and *Thales Group*.

2003-2006 : Post graduate degree in Computer Science (Real-time and Embedded Systems) at *IRCCyN*.

2003-2006 : *Centrale Nantes* diploma, top French engineering school (major Automatics, minor Project Management).

Professional achievements

Jan 11 – Now : **Assistant Professor at Telecom ParisTech (Paris – France). Design and implementation of RAMSES : Refinement of AADL Models for Synthesis of Embedded Systems. Based on OSATE : Opes-Source AADL Tool-suite Environment (developed at SEI/CMU).**

- Research
 - Advising PhD students.
 - Responsible for Telecom ParisTech contributions in the scope of ANR PARSEC (national research project).
 - Participation to research project proposals (National and European projects).
- Teaching
 - Teaching Model Driven Engineering techniques (based on UML and AADL).
 - Basic course of C language and operating system concepts.
 - Initiation to Software Engineering and group project course.
 - Erasmus contract for staff exchanges with Mälardalens Högskola (Sweden).

Jan 10 – Jan 11 : **Post-doctoral fellow at Mälardalens Högskola (Västerås – Sweden). Code generation for the formal semantics of the ProCom component model; design and implementation of a synthesis plugin for PRIDE (ProCom component model).**

- Research
 - Prototype development using Eclipse-based state-of-the art technologies (Xtext, QVT, Acceleo, CDT, etc...).
 - Involvement in the SSF – PROGRESS national project.
 - Research proposal writing (personal funding).
- Teaching
 - Advanced Component-Based Software Engineering (ACBSE) course.

Nov 06 – Dec 09 : **Ph.D student at Thales Group. Design and implementation of MyCCM-HI (Make your Component Container Model – High Integrity), a software component framework providing with tools the system/software design process for the realization of critical and multi-modal distributed real-time embedded systems.**

- Involvement in national and European collaborative projects (Flex-eWare, INFLEXION, and SPICES).
- In the scope of Flex-eWare project :
 - Specification of COAL (Component-Oriented Architecture Language): an architecture description language that enables to represent the modes, modes switches, and software (re)configuration of a real-time embedded system.
 - Specification of COAL to AADL mapping
 - Implementation of MyCCM-HI¹ C code generators (ANTLR parser, EMF Meta-models, java code, StringTemplate) dedicated to implement the adaptation and mode switch protocols.
- In the scope of INFLEXION project :
 - Implementation of CORBA based reconfiguration mechanisms
 - Implementation of Python script in order to apply reconfiguration scripts.
- Participation to the AADL (Architecture Analysis & Design Language) standardization committee.

Apr 06 – Nov 06 : **Feasibility study and realization of a safety verification prototype for avionics embedded systems. M.Sc contribution realized for Dassault Aviation at IRCCyN (research institute in communication and cybernetics).**

- Case studies modeling with AADL.
- Specification of transformation rules into timed Petri nets formalism.
- Implementation of the transformation rules into Roméo tool (timed Petri nets analyzer).

Apr 05 - Aug 05 : **Design and realization of a new architecture (based dynamic library) for software products of the Expandium company, start-up specialized in quality of service analysis for mobile telecommunication networks.**

- Design and realization of a new software architecture.
- Creation of dynamic libraries for identified modules (C++) on Linux, Windows and Mac OS X.
- Collaborative work (sharing of modification thanks to CVS).

¹ MyCCM-HI is an open source component framework available at <http://myccm-hi.sourceforge.net>

Computing and Linguistics Skills

<u>Computing</u> :	Operating Systems : Linux, Windows , Mac OS X, Elinos (commercial RTOS). Modeling and standardization : EMF, UML, AADL, CCM, D&C, CORBA. Programming Languages : C/C++, Java, python, VHDL. Real-time design tools : Cheddar (schedulability analysis), Roméo (timed Petri nets), UPPAAL (timed automata)
<u>Foreign Language</u> :	English : Fluent. Spanish : Conversational.

Publications

Conferences :

- Fabien Cadoret, Etienne Borde, Sébastien Gardoll and Laurent Pautet. **Design Patterns for Rule-based Refinement of Safety Critical Embedded Systems Models.** *International Conference on Engineering of Complex Computer Systems (ICECCS'12), Paris (FRANCE), 2012.*
- Michael Lafaye, Laurent Pautet, Etienne Borde, Marc Gatti, and David Faura. **Model driven resource usage simulation for critical embedded systems.** *International Conference on Design, Automation and Test in Europe (DATE'12), Dresden (GERMANY), 2012.*
- Hang Yin, Etienne Borde, and Hans Hansson. **Composable mode switch for component-based systems.** *3rd Workshop on Adaptive and Reconfigurable Embedded Systems (APRES'11), Chicago (USA), 2011.*
- E.Borde and J.Carlson. **Towards verified synthesis of ProCom, a component model for real-time embedded systems.** *Component-Based Software Engineering (CBSE'11), Boulder (USA), 2011.*
- E.Borde and J.Carlson. **Automatic Synthesis and Adaption of Gray-Box Components for Embedded Systems - Reuse vs. Optimization.** *COMPSAC'11 Workshops, Munich (GERMANY), 2011.*
- Thomas Leveque, Jan Carlson, Séverine Sentilles, and Etienne Borde. **Flexible Semantic-Preserving Flattening of Hierarchical Component Models.** *EUROMICRO Conference on Software Engineering and Advanced Applications (SEAA'11), Oulu (Finland), 2011.*
- T.Leveque, E.Borde, A.Marref and J.Carlson. **Hierarchical Composition of Parametric WCET in a Component Based Approach.** *IEEE International Symposium on Object/Component/Service-Oriented Real-Time Distributed Computing (ISORC'11), Newport Beach (USA), 2011.*
- E.Borde. **Formal Model Assisted Code Generation for Critical Embedded Systems.** *International Workshop on Component-Oriented Programming (WCOP'10), Prague (CZECH REPUBLIC), 2010.*
- E.Borde, G.Haik, L.Pautet, and P.Feiler. **A New Design Approach for Adaptive Embedded Systems.** *Workshop on Adaptive and Reconfigurable Embedded Systems (APRES'09), Grenoble (FRANCE), 2009.*
- E.Borde, G.Haik, and L.Pautet. **Dynamic Adaptation of Critical Systems, an new approach.** (Adaptation dynamique des systèmes critiques, une nouvelle approche.) *Ecole d'été Temps-réel² (ETR'09), Paris (FRANCE), 2009.*
- E.Borde, G.Haik, and L.Pautet. **Mode-Based Reconfiguration of Critical Software Component Architectures.** *International Conference on Design, Automation and Test in Europe (DATE'09), Nice (FRANCE), 2009*
- H.Balp, E.Borde, G.Haik, and J.-F.Tilman. **Automatic Composition of AADL Models for the Verification of Critical Component-Based Embedded Systems.** *International workshop on AADL and UML (UML-AADL'08), Belfast (IRELAND), 2008.*
- E.Borde, G.Haik, V.Watine and L.Pautet. **Really Hard Time developing Hard Real Time.** *National Workshop on Control Architectures of Robots (CAR'07), Paris (FRANCE) 2007*

National Journals :

- E.Borde, F.Gilliers, G.Haik, J.Hugues and L.Pautet. **MyCCM-HI : a component framewrok carrying out a model driven engineering approach.** (MyCCM-HI : un framework à composants mettant en œuvre une approche d'ingénierie dirigée par les modèles.) *Revue Génie Logiciel³, n° 89, juin 2009.*
- E.Borde, C.Castellanos, H.Balp, F.Cadoret, L.Pautet, D.Potop-Butucaru, Y.Sorel and P.Dissaux. **Les apports de l'IDM à la sécurité et à la sûreté de fonctionnement. Une application à la radio logicielle** *Revue Génie Logiciel, n°101, juin 2012.*

Book chapters :

- E.Borde, G.Haik, V.Seignole, and V.Watine. **From model to platform, a multi-domain component framework.** (Du modèle à la plate-forme, un framework à composants Multi-Domains). *Chapter 4 of the book : Distributed Systems in action : from embedded to large scale systems. (Systèmes répartis en action: de l'embarqué aus systèmes à large échelle), Ed. Lavoisier.*
- E.Borde. **Software Engineering for Adaptive Embedded Systems.** *Chapter 8 of the book: Distributed Systems Design and Algorithms. Ed. WILEY.*

Miscellaneous

Sports : Mountaineering, rowing (national and international competition), rugby, running.
Hobbies : Harmonica (blues).