Ludovic Henrio
I3S – SCALE project
2000, route des Lucioles - Les Algorithmes - bât. Euclide
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FRANCE

Born: 27/08/1976 in St Etienne (France)
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Education and Experience

2016 Leader of the SCALE Project.
COMRED team – CNRS/I3S/Univ. of Nice Sophia Antipolis

2014–2015 Scientific leader of the SCALE Team
joint project INRIA/CNRS/I3S/Univ. of Nice Sophia Antipolis

2012 *Habilitation à diriger des recherches* (HDR). Defended the 19th of July 2012
subject: *Formal Models for Programming and Composing Correct Distributed Systems.*
jury members: Gordon Blair (reviewer), pascal Poizat (reviewer), Davide Sangiorgi (reviewer), Fabienne Boyer, Michel Riveill, Alan Schmitt.

2005-2013 OASIS Team - joint project INRIA/CNRS/I3S/Univ. of Nice Sophia Antipolis

since 2005 Associate Scientist at **CNRS** – CR1 since 2009

2004 - 05
1 year Research fellow at the **University of Westminster**:
Teaching at Harrow School of Computer Science
Research in the "Distributed and High Performance Computing" department.
Keywords: components, Grid, non-functional aspects, reconfiguration.

2003 - 04
1 year Temporary teaching and Research assistant:
Univ. of Nice Sophia-Antipolis at ESSI (computer science engineer school)
Research at INRIA Sophia-Antipolis - OASIS team (INRIA/CNRS/I3S/Univ. of Nice Sophia Antipolis)

2001 - 03
3 years Ph.D in Computer Science: University of Nice Sophia-Antipolis
defended the 28th of November 2003 in Sophia Antipolis
Subject: *Asynchronous Object Calculus: Confluence and Determinacy*

Advisor:	Denis Caromel	UNSA, IUF
Co-advisor:	Bernard Paul Serpette	INRIA Sophia Antipolis
Reviewer:	Luca Cardelli	Microsoft research, Cambridge
	Ugo Montanari	Universita di Pisa
	Elie Najm	ENST, Paris
Jury members:	Gérard Boudol (president)	INRIA Sophia Antipolis
	Gilles Kahn	INRIA

Keywords: Parallelism, concurrency, object calculus, confluence, distribution.

2000 5 months	Research internship at **INRIA Sophia Antipolis** - OASIS project Static analysis of Java Card Object Sharing. keywords: Security, Java Card, static analysis, typing.
1999 - 00	Master Degree in Computer Science: "*Programming* : semantics proofs and languages". University of Paris 7.
1999 4 months	Research internship at INRIA Sophia Antipolis - OASIS team Interactive testing of Java Card Applications. keywords: static analysis, Java Card, tests.
1996 - 99	*Polytechnique School*

10 Selected Publications

- Ludovic Henrio and Justine Rochas. From modelling to systematic deployment of distributed active objects. In *COORDINATION 2016*, June 2016.
- Ludovic Henrio, Oleksandra Kulankhina, and Eric Madelaine. Integrated environment for verifying and running distributed components. In *Proc. International Conference on Fundamental Approaches to Software Engineering (FASE 2016)*
- Françoise Baude, Ludovic Henrio, and Cristian Ruz. Programming distributed and adaptable autonomous components - the GCM/ProActive framework. *Software, Practice and Experience*, 2014.
- Francesco Bongiovanni and Ludovic Henrio. A mechanized model for can protocols. In *16th International Conference on Fundamental Approaches to Software Engineering (FASE'13)*, LNCS. Springer, 2013
- Ludovic Henrio, Fabrice Huet, and Zsolt István. Multi-threaded active objects. In *COORDINATION 2013*, June 2013.
- Mario Leyton, Ludovic Henrio, and José M. Piquer. Exceptions for algorithmic skeletons. In *16th Int. European Conference on Parallel and Distributed Computing (Euro-Par 2010)*.
- Tomás Barros, Rabéa Ameur-Boulifa, Antonio Cansado, Ludovic Henrio, and Eric Madelaine. Behavioural models for distributed fractal components. *Annales des Télécommunications*, 64(1-2):25–43, 2009.
- Denis Caromel, Ludovic Henrio, and Bernard P. Serpette. Asynchronous sequential processes. *Information and Computation*, 207(4):459–495, 2009.
- Denis Caromel and Ludovic Henrio. *A Theory of Distributed Objects*. Springer-Verlag, 2005.
- Denis Caromel, Ludovic Henrio, and Bernard Paul Serpette. Asynchronous and deterministic objects. In *Proceedings of the 31st ACM SIGACT-SIGPLAN symposium on Principles of programming languages (POPL)*, pages 123–134. ACM Press, 2004.

List of Publications

Most of my papers are available at `http://www-sop.inria.fr/members/Ludovic.Henrio`. Note that in most of my papers authors are ordered alphabetically.

▶ Book:

[1] Denis Caromel and Ludovic Henrio. *A Theory of Distributed Objects*. Springer-Verlag, 2005.

▶ Book Chapters:

[2] Francoise Baude, Denis Caromel, Ludovic Henrio, and Paul Naoumenko. A flexible model and implementation of component controllers. In *Making Grids Work – Post-Proceedings Selected Papers From The Coregrid Workshop On Grid Programming Model, Grid And P2p Systems Architecture, Grid Systems, Tools And Environments, June 2007*, pages 31–43. Springer US, 2008. 10.1007/978-0-387-78448-9_3.

[3] Antonio Cansado, Denis Caromel, Ludovic Henrio, Eric Madelaine, Marcela Rivera, and Emil Salageanu. *The Common Component Modeling Example: Comparing Software Component Models*, volume 5153 of *Lecture Notes in Computer Science*, chapter A Specification Language for Distributed Components implemented in GCM/ProActive. Springer, 2008. `http://agrausch.informatik.uni-kl.de/CoCoME`.

[4] Maciej Malawski, Tomasz Gubala, Marek Kasztelnik, Tomasz Bartynski, Marian Bubak, Francoise Baude, and Ludovic Henrio. High-level scripting approach for building component-based applications on the grid. In *Making Grids Work – Post-Proceedings Selected Papers From The Coregrid Workshop On Grid Programming Model, Grid And P2p Systems Architecture, Grid Systems, Tools And Environments, June 2007*, pages 309–321. Springer US, 2008. 10.1007/978-0-387-78448-9_25.

[5] Maciej Malawski, Marian Bubak, Françoise Baude, Denis Caromel, Ludovic Henrio, and Matthieu Morel. Interoperability of grid component models: GCM and CCA case study. In Thierry Priol and Marco Vanneschi, editors, *Towards Next Generation Grids: Proceedings of the CoreGrid Symposium*, pages 95–105. Springer US, 2007. 10.1007/978-0-387-72498-0_9.

▶ Journals:

[6] Matías Ibañez, Cristian Ruz, Ludovic Henrio, and Javier Bustos-Jiménez. Reconfigurable applications using gcmscript. *IEEE Cloud computing. Special issue: Autonomic clouds*, 2016. To appear.

[7] Tatiana Aubonnet, Ludovic Henrio, Soumia Kessal, Oleksandra Kulankhina, Frédéric Lemoine, Eric Madelaine, Cristian Ruz, and Noëmie Simoni. Management of service composition based on self-controlled components. *Journal of Internet Services and Applications*, 6(15):17, 2015.

[8] Françoise Baude, Ludovic Henrio, and Cristian Ruz. Programming distributed and adaptable autonomous components - the GCM/ProActive framework. *Software, Practice and Experience*, 2014.

[9] Ludovic Henrio, Florian Kammüller, and Bianca Lutz. ASPfun : A typed functional active object calculus. *Science of Computer Programming*, 77(7-8):823–847, July 2012.

[10] Françoise Baude, Virginie Legrand, Ludovic Henrio, Paul Naoumenko, Heiko Pfeffer, Louay Bassbouss, and David Linner. Mixing Workflows and Components to Support Evolving Services. *International Journal of Adaptive, Resilient and Autonomic Systems (IJARAS)*, 1(4):60–84, 2010.

[11] Tomás Barros, Rabéa Ameur-Boulifa, Antonio Cansado, Ludovic Henrio, and Eric Madelaine. Behavioural models for distributed fractal components. *Annales des Télécommunications*, 64(1-2):25–43, 2009.

[12] Françoise Baude, Denis Caromel, Cédric Dalmasso, Marco Danelutto, Vladimir Getov, Ludovic Henrio, and Christian Pérez. GCM: a grid extension to fractal for autonomous distributed components. *Annales des Télécommunications*, 64(1-2):5–24, 2009.

[13] Denis Caromel, Ludovic Henrio, and Bernard P. Serpette. Asynchronous sequential processes. *Inf. Comput.*, 207(4):459–495, 2009.

[14] Françoise Baude, Denis Caromel, Christian Delbé, and Ludovic Henrio. Un protocole de tolérance aux pannes pour objets actifs non préemptifs. *Technique et Science Informatiques*, 2006.

[15] Isabelle Attali, Denis Caromel, Carine Courbis, Ludovic Henrio, and Henrik Nilsson. An integrated development environment for Java Card. *Computer Networks*, 2001.

▶ Conferences and Workshops:

[16] Ludovic Henrio, Eric Madelaine, and Min Zhang. A theory for the composition of concurrent processes. In Elvira Albert and Ivan Lanese, editors, *FORTE 2016*, LNCS. IFIP International Federation for Information Processing, Springer, June 2016. 11th International Federated Conference on Distributed Computing Techniques, Heraklion, Greece. Extended version available at: `https://hal.archives-ouvertes.fr/hal-01299562`.

[17] Ludovic Henrio and Justine Rochas. From modelling to systematic deployment of distributed active objects. In Alberto Lluch Lafuente and José Proença, editors, *COORDINATION 2016*, LNCS. IFIP International Federation for Information

Processing, Springer, June 2016. 11th International Federated Conference on Distributed Computing Techniques, Heraklion, Greece. Extended version available at: `https://hal.archives-ouvertes.fr/hal-01299817`.

[18] Ludovic Henrio, Oleksandra Kulankhina, and Eric Madelaine. Integrated environment for verifying and running distributed components. In *Proc. International Conference on Fundamental Approaches to Software Engineering (FASE 2016)*, LNCS. Springer, 2016. Extended version available at: `https://hal.archives-ouvertes.fr/hal-01252323`.

[19] Nuno Gaspar, Ludovic Henrio, and Eric Madelaine. Painless support for static and runtime verification of component-based applications. In *Fundamentals of Software Engineering (FSEN'2015)*, page 15, Teheran, Iran, April 2015.

[20] Ludovic Henrio, Eric Madelaine, and Min Zhang. pNets: an Expressive Model for Parameterised Networks of Processes. In *Formal Approaches to Parallel and Distributed Systems (4PAD)-Special Session of Parallel, Distributed and network-based Processing (PDP)*, Turku, Finland, 2015. Extended version available at: `https://hal.inria.fr/hal-01055091v2`.

[21] Ludovic Henrio, Oleksandra Kulankhina, Dongqian Liu, and Eric Madelaine. Verifying the correct composition of distributed components: Formalisation and Tool. Rome, September 2014.

[22] Ludovic Henrio and Justine Rochas. Declarative scheduling for active objects. In Sung Y. Shin, editor, *SAC 2014 - 29th Symposium On Applied Computing*, Gyeongju, March 2014. ACM Special Interest Group on Applied Computing, ACM.

[23] Gustavo Pabón and Ludovic Henrio. Self-configuration and self-optimization autonomic skeletons using events. In Pavan Balaji, Minyi Guo, and Zhiyi Huang, editors, *Proceedings of the 2014 PPOPP International Workshop on Programming Models and Applications for Multicores and Manycores, PMAM 2014, Orlando, Florida, USA, February 15, 2014*. ACM, 2014.

[24] Ludovic Henrio, Fabrice Huet, and Justine Rochas. An optimal broadcast algorithm for content-addressable networks. In *Principles of Distributed Systems, 17th International Conference, OPODIS 2013, Nice, France*, LNCS. Springer, December 2013.

[25] Nuno Gaspar, Ludovic Henrio, and Eric Madelaine. Formally Reasoning on a Reconfigurable Component-Based System — A Case Study for the Industrial World. In *The 10th International Symposium on Formal Aspects of Component Software*, Nanchang, China, October 2013.

[26] Nuno Gaspar, Ludovic Henrio, and Eric Madelaine. Bringing coq into the world of gcm distributed applications. In *International Symposium on High-level Parallel Programming and Applications, HLPP*, Paris, France, July 2013.

[27] Ludovic Henrio, Fabrice Huet, and Zsolt István. Multi-threaded active objects. In Christine Julien and Rocco De Nicola, editors, *COORDINATION 2013*, LNCS. IFIP

International Federation for Information Processing, Springer, June 2013. 15th International Conference on Coordination Models and Languages, Florence, Italy.

[28] Francesco Bongiovanni and Ludovic Henrio. A mechanized model for can protocols. In *16th International Conference on Fundamental Approaches to Software Engineering (FASE'13)*, LNCS. Springer, 2013.

[29] Rabéa Ameur Boulifa, Raluca Halalai, Ludovic Henrio, and Eric Madelaine. Verifying safety of fault-tolerant distributed components. In *International Symposium on Formal Aspects of Component Software (FACS 2011)*, Lecture Notes in Computer Science, Oslo, Sept 2011. Springer.

[30] Ludovic Henrio, Fabrice Huet, Zsolt István, and Gheorghen Sebestyén. Adapting active objects to multicore architectures. In *ISPDC*. IEEE Computer Society, 2011.

[31] Ludovic Henrio, Muhammad Uzair Khan, Nadia Ranaldo, and Eugenio Zimeo. First class futures: Specification and implementation of update strategies. In *Post-Proceedings Selected Papers From The Coregrid Workshop On Grids, Clouds and P2P Computing August 31, 2010*, August 2010.

[32] Rabéa Ameur Boulifa, Ludovic Henrio, and Eric Madelaine. Behavioural models for group communications. In *WCSI-10: International Workshop on Component and Service Interoperability*, 2010.

[33] Ludovic Henrio, Florian Kammüller, and Muhammad Uzair Khan. A framework for reasoning on component composition. In *FMCO 2009*, Lecture Notes in Computer Science. Springer, 2010.

[34] Ludovic Henrio and Muhammad Uzair Khan. Asynchronous components with futures: Semantics and proofs in isabelle/hol. In *Proceedings of the Seventh International Workshop, FESCA 2010*. ENTCS, 2010.

[35] Mario Leyton, Ludovic Henrio, and José M. Piquer. Exceptions for algorithmic skeletons. In *16th Int. European Conference on Parallel and Distributed Computing (Euro-Par 2010)*, 2010.

[36] Boutheina Bannour, Ludovic Henrio, and Marcela Rivera. A reconfiguration framework for distributed components. In *SINTER Workshop Software Integration and Evolution @ Runtime*. ACM, 2009.

[37] Françoise Baude, Ludovic Henrio, and Paul Naoumenko. Structural reconfiguration: An autonomic strategy for gcm components. In *International Conference on Autonomic and Autonomous Systems*, pages 123–128, Los Alamitos, CA, USA, 2009. IEEE Computer Society.

[38] Ludovic Henrio and Florian Kammüller. Functional active objects: Typing and formalisation. In *Proceedings of the International Workshop on the Foundations of Coordination Languages and Software Architecture (FOCLASA)*. Elsevier, 2009.

[39] Ludovic Henrio, Florian Kammüller, and Marcela Rivera. An asynchronous distributed component model and its semantics. In Frank S. de Boer, Marcello M.

Bonsangue, and Eric Madelaine, editors, *Formal Methods for Components and Objects, 7th International Symposium, FMCO 2008, Sophia Antipolis, France, October 21-23, 2008, Revised Lectures*, volume 5751 of *Lecture Notes in Computer Science*, pages 159–179. Springer, 2009.

[40] Antonio Cansado, Ludovic Henrio, and Eric Madelaine. Transparent first-class futures and distributed component. In *International Workshop on Formal Aspects of Component Software (FACS'08)*, Malaga, Sept 2008. Electronic Notes in Theoretical Computer Science (ENTCS).

[41] Antonio Cansado, Ludovic Henrio, and Eric Madelaine. Unifying architectural and behavioural specifications of distributed components. In *International Workshop on Formal Aspects of Component Software (FACS'08)*, Malaga, Sept 2008. Electronic Notes in Theoretical Computer Science (ENTCS).

[42] Denis Caromel, Ludovic Henrio, and Mario Leyton. Type safe algorithmic skeletons. In *Proceedings of the 16th Euromicro International Conference on Parallel, Distributed and network-based Processing*, Toulouse, France, February 2008.

[43] Denis Caromel, Ludovic Henrio, and Eric Madelaine. Active objects and distributed components: Theory and implementation. In Frank de Boer and Marcello Bonsangue, editors, *FMCO 2007*, number 5382 in LNCS, pages 179–199, Berlin Heidelberg, 2008. Springer-Verlag.

[44] Ludovic Henrio and Marcela Rivera. Stopping safely hierarchical distributed components: application to gcm. In *CBHPC '08: Proceedings of the 2008 compFrame/HPC-GECO workshop on Component based high performance*, pages 1–11, New York, NY, USA, 2008. ACM.

[45] Denis Caromel, Guillaume Chazarain, and Ludovic Henrio. Garbage collecting the grid: a complete dgc for activities. In *Proceedings of the 8th ACM/IFIP/USENIX International Middleware Conference*, Newport Beach, CA, November 2007.

[46] Françoise Baude, Ludovic Henrio, and Paul Naoumenko. A Component Platform for Experimenting with Autonomic Composition. In *First International Conference on Autonomic Computing and Communication Systems (Autonomics 2007). Invited Paper*. ACM Digital Library, Oct 2007.

[47] Ludovic Henrio and Florian Kammüller. A mechanized model of the theory of objects. In *9th IFIP International Conference on Formal Methods for Open Object-Based Distributed Systems (FMOODS)*, LNCS. Springer, June 2007.

[48] Françoise Baude, Denis Caromel, Ludovic Henrio, and Matthieu Morel. Collective interfaces for distributed components. In *CCGrid 2007: IEEE International Symposium on Cluster Computing and the Grid*, May 2007.

[49] Françoise Baude, Denis Caromel, Christian Delbé, and Ludovic Henrio. Promised messages: Recovering from inconsistent global states. In *ACM SIGOPS conference Principles and Practice of Parallel Programming (PPoPP). Poster*, 2007.

[50] Sébastien Bezinne, Virginie Galtier, Stéphane Vialle, Françoise Baude, Mireille Bossy, Viet-Dung Doan, and Ludovic Henrio. A fault tolerant and multi-paradigm grid architecture for time constrained problems. application to financial option pricing. In *2nd IEEE International Conference on e-Science and Grid Computing*. IEEE, December 2006.

[51] Denis Caromel and Ludovic Henrio. Asynchonous distributed components: Concurrency and determinacy. In *Proceedings of the IFIP International Conference on Theoretical Computer Science 2006 (IFIP TCS'06)*, Santiago, Chile,, August 2006. Springer Science. 19th IFIP World Computer Congress.

[52] Antonio Cansado, Ludovic Henrio, and Eric Madelaine. Towards real case component model-checking. In *5th Fractal Workshop*, Nantes, France, July 2006.

[53] Jeyarajan Thiyagalingam, Nikos Parlavantzas, Stavros Isaiadis, Ludovic Henrio, Denis Caromel, and Vladimir Getov. Proposal for a lightweight generic grid platform architecture. In *Proceedings of CompFrame 2006, Component and Framework Technology in High-Performance and Scientific Computing*, Paris, France, June 2006. IEEE.

[54] Alessandro Basso, Alexander Bolotov, Artie Basukoski, Vladimir Getov, Ludovic Henrio, and Mariusz Urbanski. Specification and verification of reconfiguration protocols in grid component systems. In *Proceedings of the 3rd IEEE Conference On Intelligent Systems IS-2006*. IEEE Computer Society, 2006. long version published as a CoreGRID Technical Report, TR-0042.

[55] Tomás Barros, Ludovic Henrio, and Eric Madelaine. Verification of distributed hierarchical components. In *International Workshop on Formal Aspects of Component Software (FACS'05)*, Macao, October 2005. Electronic Notes in Theoretical Computer Science (ENTCS).

[56] Isabelle Attali, Denis Caromel, Ludovic Henrio, and Felipe Luna Del Aguila. Secured information flow for asynchronous sequential processes. In *3rd International Workshop on Security Issues in Concurrency (SecCo'05)*, Electronic Notes in Theoretical Computer Science, San Francisco, USA, August 2005. Elsevier.

[57] Laurent Baduel, Françoise Baude, Denis Caromel, Ludovic Henrio, Fabrice Huet, Stéphane Lanteri, and Matthieu Morel. Grid components techniques: Composing, gathering, and scattering. In *Coupled Problems 2005, Computational Methods for Coupled Problems in Science and Engineering, an ECCOMAS Thematic Conference*, Santorini, Greece, may 2005.

[58] Tomás Barros, Ludovic Henrio, and Eric Madelaine. Behavioural models for hierarchical components. In *Proceedings of SPIN'05*. Spinger Verlag, 2005.

[59] Françoise Baude, Denis Caromel, Christian Delbé, and Ludovic Henrio. A Hybrid Message Logging-CIC Protocol for Constrained Checkpointability. In *Proc. of the 11th International Euro-Par Conference*, volume 3648 of *LNCS*. Springer-Verlag, 2005.

[60] Ludovic Henrio, Bernard Paul Serpette, and Szabolcs Szentes. Algorithmes et complexités de la réduction statique minimale. In *Actes des journées JFLA*, Sainte-Marie-de-Ré, France, January 2004.

[61] Denis Caromel, Ludovic Henrio, and Bernard Paul Serpette. Asynchronous and deterministic objects. In *Proceedings of the 31st ACM SIGACT-SIGPLAN symposium on Principles of programming languages (POPL)*, pages 123–134. ACM Press, 2004.

[62] Ludovic Henrio and Bernard Paul Serpette. A parameterized polyvariant Byte-Code verifier. In *Actes des journées JFLA*, Chamrousse, France, January 2003.

[63] Denis Caromel, Ludovic Henrio, and Bernard Serpette. Context inference for static analysis of java card object sharing. In *Proceedings e-Smart 2001*. Springer-Verlag, 2001.

[64] Isabelle Attali, Denis Caromel, Carine Courbis, Ludovic Henrio, and Henrik Nilsson. Smart Tools for Java Cards. In Josep Domingo-Ferrer, David Chan, and Anthony Watson, editors, *Smart Card Research and Advanced Applications*. Kluwer Academic Publishers, September 2000. Proceedings of the IFIP Fourth Working Conference on Smart Card Research and Advanced Applications (CARDIS 2000), HP Labs, Bristol, UK.

▶ Thesis and Habilitation thesis:

[65] Ludovic Henrio. *Formal Models for Programming and Composing Correct Distributed Systems*. PhD thesis, Université de Nice Sophia-Antipolis, July 2012. HDR Thesis.

[66] Ludovic Henrio. *Calcul d'Objets Asynchrones : Confluence et Déterminisme*. PhD thesis, Université de Nice Sophia-Antipolis, 2003. `http://www-sop.inria.fr/oasis/Ludovic.Henrio/these`.

▶ Research Reports:

[67] Justine Rochas and Ludovic Henrio. A ProActive Backend for ABS: from Modelling to Deployment. Research Report RR-8596, INRIA, September 2014.

[68] Ludovic Henrio and Eric Madelaine. Behavioural verification of distributed components. preproceedings of ICE 2013, 2013.

[69] Rabéa Ameur-Boulifa, Ludovic Henrio, Eric Madelaine, and Alexandra Savu. Behavioural Semantics for Asynchronous Components. Research Report RR-8167, INRIA, December 2012.

[70] Ludovic Henrio, Fabrice Huet, and Zsolt István. A language for multi-threaded active objects. Research Report RR-8021, INRIA, July 2012.

[71] Francesco Bongiovanni and Ludovic Henrio. Mechanical Support for Efficient Dissemination on the CAN Overlay Network. Research Report RR-7599, INRIA, April 2011. Also accepted at CFSE 2011.

[72] Heiko Pfeffer, Louay Bassbouss, Paul Naoumenko, Daniele Miorandi, David Lowe, Mihaela Ion, and Lahti Janne. Bio inspired service creation and evolution. Technical Report D.3.2.6, BIONETS IP Project Delivrable from the Autonomic Service Life-Cycle And Service Ecosystems WP (3.2), December 2009.

[73] Françoise Baude, Ludovic Henrio, Paul Naoumenko, Daniele Miorandi, and Janne Lathi and. Evaluating the fitness of service compositions. Technical Report D.3.2.5, BIONETS IP Project Delivrable from the Autonomic Service Life-Cycle And Service Ecosystems WP (3.2), September 2009.

[74] Muhammad Uzair Khan and Ludovic Henrio. First class futures: A study of update strategies. Technical report, INRIA a CCSD electronic archive server based on P.A.O.L [http://hal.inria.fr/oai/oai.php] (France), 2009. RR-7113.

[75] J. Lahti, Ludovic Henrio, K. Ville, F. Laura, Daniele Miorandi, David Linner, Heiko Pfeffer, and Françoise Baude. Advanced service life-cycle and integration. Technical Report D.3.2.4, BIONETS IP Project Delivrable from the Autonomic Service Life-Cycle And Service Ecosystems WP (3.2), June 2008.

[76] David Linner, Heiko Pfeffer, Stephan Steglich, Françoise Baude, Ludovic Henrio, and Paul Naoumenko. Service probes implementation and evaluation. Technical Report D.3.4.1, BIONETS IP Project Delivrable from the Service Probes WP (3.4), June 2008.

[77] Marco Aldinucci, Sonia Campa, Massimo Coppola, Marco Danelutto, G. Zoppi, Alessandro Basso, Alexander Bolotov, Francoise Baude, Hinde Bouziane, Denis Caromel, Ludovic Henrio, Christian Pérez, Jose Cunha, Classen Michael, Philipp Classen, Christian Lengauer, J. Cohen, S. Mc Gough, Natalia Currle-Linde, Patrizio Dazzi, Nicola Tonellotto, Jan Dünnwebber, Sergei Gorlatch, Peter Kilpatrick, Nadia Ranaldo, and Eugenio Zimeo. Proceedings of the programming model institute technical meeting 2008. Technical Report TR-0138, Institute of Programming Model, CoreGRID - Network of Excellence, May 2008.

[78] Françoise Baude, Ludovic Henrio, Paul Naoumenko, and Heiko Pfeffer. Graph-Based Service Individual specification: Creation and Representation. Technical report, BIONETS IP Project Delivrable from the Autonomic Service Life-Cycle And Service Ecosystems WP (3.2), Jan, revised June 2008. `http://www.bionets.eu/docs/BIONETS_D3_2_3.pdf`.

[79] Ludovic Henrio and Marcela Rivera. An algorithm for safely stopping a component system. Research Report RR-6444, INRIA, 2008.

[80] OASIS team and other partners in the CoreGRID Programming Model Virtual Institute. Innovative features of gcm (with sample case studies): a technical survey. Technical report, CoreGRID, Programming Model Virtual Institute, Sep. 2007. Deliverable D.PM.07.

[81] Françoise Baude, Ludovic Henrio and partners TUB, UBASEL, CN, SUN, NOKIA, VTT, TI of the BIONETS consortium. Specification of service evolution. Technical

report, BIONETS IP Project Delivrable from the Autonomic Service Life-Cycle And Service Ecosystems WP (3.2), Aug 2007. http://www.bionets.eu/docs/BIONETS_D3_2_2.pdf.

[82] Ludovic Henrio, Florian Kammüller, and Henry Sudhof. Aspfun: A functional and distributed object calculus semantics, type-system, and formalization. Research Report 6353, INRIA, 11 2007.

[83] F. Baude, V. D. Doan, L. Henrio, P. Naoumenko, and partners VTT, TUB, UBasel, CreateNet, SUN, Nokia of the BIONETS consortium. Specification of service life-cycle. Technical Report D.3.2.1, BIONETS IP Project Delivrable from the Requirement and Analysis workpackage (3.2), Dec. 2006.

[84] OASIS team and other partners in the CoreGRID Programming Model Virtual Institute. Survey of advanced component programming models. Technical report, CoreGRID, Programming Model Virtual Institute, Oct. 2006. Deliverable D.PM.05, CoreGRID, Programming Model Institute.

[85] CoreGRID Programming Model Virtual Institute. Programming models for the single gcm component: a survey, Sep. 2006. Deliverable D.PM.06.

[86] F. Baude, L. Henrio, and partners VTT, TUB, UNIHH of the BIONETS consortium. Service architecture requirement specification. Technical Report D.3.1.1, BIONETS IP Project Delivrable from the Requirement and Analysis workpackage (3.1), July 2006.

[87] Françoise Baude, Denis Caromel, Ludovic Henrio, Matthieu Morel, and Paul Naoumenko. Fractalising fractal controller for a componentisation of the non-functional aspects. 5th Fractal Workshop in conjunction with ECOOP'20 – poster, July 2006.

[88] Alessandro Basso, Alexander Bolotov, Artie Basukoski, Vladimir Getov, Ludovic Henrio, and Mariusz Urbanski. Specification and verification of reconfiguration protocols in grid component systems. Technical report, Institute on Programming Model (WP3), May 2006. CoreGRID Technical Report, TR-0042.

[89] OASIS team and other partners in the CoreGRID Programming Model Virtual Institute. Proposals for a grid component model. Technical Report D.PM.02, CoreGRID, Programming Model Virtual Institute, Feb 2006. Responsible for the delivrable.

[90] Rosa M. Badia, Olav Beckmann, Sofia Panagiotidi, Denis Caromel, Ludovic Henrio, Marian Bubak, Maciek Malawski, Vladimir Getov, Stavros Isaiadis, Jeyarajan Thiyagalingam, and Vladimir Lazarov. Lightweight grid platform: Design methodology. Technical report, Institute on Grid Systems, Tools and Environments, Jan 2006. CoreGRID Technical Report, TR-0020.

[91] D. Caromel, C. Delbé, and L. Henrio. Promised consistency for rollback recovery. Technical report, INRIA, Sophia Antipolis, 2006. Technical report n RR-5902.

[92] CoreGRID, Programming Model Institute. Basic features of the grid component model (assessed). Technical report, CoreGRID, Programming Model Virtual Institute, 2006. Deliverable D.PM.04, `http://www.coregrid.net/mambo/images/stories/Deliverables/d.pm.04.pdf`.

[93] Ludovic Henrio and Florian Kammüller. A formalization of the theory of objects in Isabelle/HOL. Rapport de recherche, INRIA, 2006. RR-6079.

[94] F. Baude, D. Caromel, L. Henrio, and M. Morel. Collective interfaces for a grid component model, proposed extensions to the fractal component model. Technical report, Internal technical report, CRE France Telecom R&D, Nov 2005.

[95] T. Barros, L. Henrio, and E. Madelaine. Behavioural models for hierarchical components. Technical Report RR-5591, INRIA, June 2005.

[96] Françoise Baude, Denis Caromel, Christian Delbé, and Ludovic Henrio. A fault tolerance protocol for ASP calculus : Design and proof. Research Report, INRIA Sophia Antipolis, June 2004. RR-5246.

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[99] Ludovic Henrio, Bernard Serpette, and Szabolcs Szentes. Implementation and complexity of the lowest static reduction. Research Report, INRIA Sophia Antipolis, 2003. RR-5034.

[100] Ludovic Henrio. Analyses de partage pour applications javacard. Rapport de DEA, septembre 2000.

Students and Teaching

▶ Advised PhD Students

- **Vincenzo Mastandrea**: *" Deadlock analysis for concurrent and distributed programming "* (from Oct 2014).
  PhD advisors: Ludovic Henrio and Cosimo Laneve
  Scientific advisor: Elena Giachino, Ludovic Henrio, and Cosimo Laneve
  Summary: This thesis contribute to the formal model of multi-active objects and to their practical implementation. In particular, we will provide tools for the static analysis of deadlocks. As regards this last point, while several works already focus on the safe design of distributed applications, those works are not massively adopted in practice. The main originality of our approach is twofold. First we rely on a programming model that enforces a strong separation between remote entities. This helps us for automatically inferring behavioral types for those entities and will make our analysis more compositional, more scalable, and thus better adapted to real applications. Second, the design of our language will be mainly driven by the efficiency of program execution, by the expressiveness of the model, and by the easiness of writing distributed applications.
- **Justine Rochas**: *"Execution Support for Multi-threaded Active Objects: Design and Implementation"* (from Oct 2013).
  PhD advisors: Ludovic Henrio
  Scientific advisor: Ludovic Henrio
  Summary: In order to tackle the development of concurrent and distributed systems, the active object programming model promotes execution safety and portability of the applications that are developed with it. Active objects allow the programmer to focus on the business of concurrent entities, and let the programming model handle asynchronous interactions. There exists a variety of active object frameworks targeted at all kinds of application domains: modelling, verification, efficient execution. However, among these frameworks, a very few of them consider the multi-threaded execution of active objects, which consists in introducing shared-memory parallelism inside each concurrent entity. In this thesis, we take interest in the challenges of having multiple threads inside an active object, and how to safely schedule them for executing the tasks of an active object. We enhance the model with programming language constructs for coordination, that allow us to simulate various active object languages and frameworks, thanks to a mindful synchronisation of threads. We also give the means for making multi-threaded active objects resilient in a distributed context, through generic engineering constructs and by using the developed programming abstractions. Overall, we design a flexible programming model and framework for the development of distributed and highly concurrent applications, and we provide it with a thorough support for distributed execution.

We reinforce our programming model by formalising our work, thus exposing the execution guarantees that it gives to the programmer. Finally, we develop a peer-to-peer application that shows multi-threaded active objects and their features in action.

- **Oleksandra Kulankhina**: *"A framework for rigorous development of distributed components: formalisation and tool"* (from Oct 2013).
  PhD advisors: Eric Madelaine
  Scientific advisor: Eric Madelaine and Ludovic Henrio
  Summary: In this thesis we introduce an approach for rigorous design and development of distributed hierarchical component-based systems. The core idea of the presented work is to combine the well-known among the programmers techniques for model-driven software design and the powerful formal verification methods able to ensure the functional properties of a distributed system and to detect errors at the design stage.
  First, we introduce a UML-based graphical formalism for modeling architecture and behavior of hierarchical components. Second, we formally specify a set of constraints that ensure the correct components composition with a focus on separation between the functional and non-functional aspects. Third, we explain how the graphical models can be automatically translated into an input for a model-checker. For this aim, we rely on a formally specified intermediate structure encoding the semantics of components behavior as a network of synchronised parametrised label transition systems. We focus here on encoding the advanced features of distributed components such as one-to-many communications, reconfiguration and asynchronous communications based on request-reply.
  Finally, we implement the approach in an integrated model-driven environment which comprises a set of graphical editors, an architecture static correctness validation module, a module translating the conceptual model into an input for a verification toolsuite CADP and a generator of the implementation code.
- **Nuno Gaspar**: *"Integrated, Autonomic, and Reliable Deployment and Management for SaaS composite applications"'* (from Oct 2011).
  PhD advisors: Eric Madelaine
  Scientific advisor: Eric Madelaine and Ludovic Henrio
  Summary: The objective of this thesis is to contribute to the safety of distributed component systems. The approach proposed is to join efforts for the specifications of correct component architectures, done in the Coq theorem prover, and contribution on the behavioural specifications, done in the Vercors environment and verified by model-checking techniques.
- **Marcela Rivera**: *"Reconfiguration and Life-cycle of Distributed Components : Asynchrony, Coherence and Verification"* (Dec 2006 - Dec 2011).
  PhD advisors: Denis Caromel and Ludovic Henrio
  Scientific advisor: Ludovic Henrio
  Summary: For component programming, but even more specifically in distributed and Grid environments, components need to be highly adaptative. A great part of adaptativeness relies on dynamic reconfiguration of component systems. We introduce a new approach for reconfiguring distributed components with the main objective to facilitate the reconfiguration process and ensure the consistency and coherence of the system. First, before executing a reconfiguration it is necessary that the components is a coherent and quiescent state. This

is done to avoid inconsistency in the reconfiguration process. To achieve this, we design an algorithm for stopping a component in a safe manner and reach this quiescent state. This was realized by implementing a tagging and interception mechanism that adds informations to the requests and manipulates their flow in order to decide which of them must be served before stopping the component. Additionally, for triggering the reconfiguration tasks, we extended the FScript language to give it the capability of executing distributed reconfiguration actions, by delegating some actions to specific components. To achieve this objective, we defined an additional controller inside the management part of the components. We tested our implementation over two GCM/ProActive based applications: the CoCoME example and the TurnTable example.

- **Paul Naoumenko**: *"Designing non-functional aspects with components"* (Oct 2006 - Jul 2010)
  PhD advisors: Françoise Baude and Ludovic Henrio
  Scientific advisors: Françoise Baude and Ludovic Henrio
  Summary: In this thesis we considered programming models for large-scale and distributed applications that are deployed in dynamic ever-changing environments, like the Grid. To maintain their function with minimal involvement of human operators, those applications must provide self-adaptive capabilities. We ground our research on the autonomic computing paradigm, which proposes to design applications as compositions of autonomic elements. Those are software entities exposing two parts: a business part, and a management part, with managers in charge of supervising the business part by reacting to environmental changes. Managers have the possibility to implement complex management strategies: additionnaly to the supervision of the business part, they can contact managers from other autonomic elements involved in the application, and collaborate with them in order to elaborate adequate reactions. Strategies of managers can be dynamically updated. We propose to design distributed autonomic applications using a component-oriented model: the GCM (Grid Component Model). GCM components are distributed by essence and the model features as a part of its specification separation of concerns (GCM components have a business part and a management part), hierarchical structure, and dynamic reconfiguration. Our contribution is twofold.First, we extend the management part of GCM components, giving the possibility to include managers that correspond to the vision of autonomic computing. Thanks to newly introduced architectural elements, the managers are able to supervise the business part of GCM components. They can also contact managers of other components and collaborate with them. A GCM component with self-adaptive capabilities should be easy to produce: we suggest a development process to design and implement the management part separately from the business part, and then integrate both parts inside one unified software entity. We modify the Architecture Description Language to statically describe GCM component assemblies according to the new development process. We included the previously presented extensions in the reference implementation of GCM.

- **Muhammad-Uzair Khan**: *"A Study of First Class Futures: Specification, Formalisation, and Mechanised Proofs"* (Oct 2007 - Feb 2011)

PhD advisors: Denis Caromel and Ludovic Henrio
Scientific advisor: Ludovic Henrio
Summary: Futures enable an efficient and easy to use programming paradigm for distributed applications. A future is a placeholder for result of concurrent execution. Futures can be "first class objects"; first class futures may be safely transmitted between the communicating processes. Consequently, futures spread everywhere. When the result of a concurrent execution is available, it is communicated to all processes which received the future. In this thesis, we study the mechanisms for transmitting the results of first class futures; the 'future update strategies'.
We provide a detailed semi-formal specification of three main future update strategies adapted from ASP-Calculus ; we then use this specification for a real implementation in a distributed programming library. We study the efficiency of the three update strategies through experiments. Ensuring correctness of distributed protocols, like future update strategies is a challenging task. To show that our specification is correct, we formalise it together with a component model. Components abstract away the program structure and the details of the business logic; this paradigm thus facilitates reasoning on the protocol. We formalise in Isabelle/HOL, a component model comprising notions of hierarchical components, asynchronous communications, and futures. We present the basic constructs and corresponding lemmas related to structure of components. We present formal operational semantics of our components in presence of a future update strategy; proofs showing correctness of our future update strategy are presented. Our work can be considered as a formalisation of ProActive/GCM and shows the correctness of the middleware implementation.

- **Alessandro Basso**: *"Integrating formal reasoning into a component-based approach to reconfigurable distributed systems"*. Univ. of Westminster. (Feb 2006 - Mar 2010)
  PhD advisors: Alexander Bolotov, Vladimir Getov and Ludovic Henrio
  Scientific advisors: Alexander Bolotov
  Summary: Grid systems were born out of necessity, and had to grow quickly to meet requirements which evolved over time, becoming today's complex systems. Even the simplest distributed system nowadays is expected to have some basic functionalities, such as resources and execution management, security and optimisation features, data control, etc. The complexity of Grid applications is also accentuated by their distributed nature, making them some of the most elaborate systems to date. It is often too easy that these intricate systems happen to fall in some kind of failure, it being a software bug, or plain simple human error; and if such a failure occurs, it is not always the case that the system can recover from it, possibly meaning hours of wasted computational power.
  The difficulty of Grid systems to deal with unforeseen and unexpected circumstances resulting from dynamic reconfiguration is related to the fact that Grid applications are large, distributed and prone to resource failures. This research has produced a methodology for the solution of this problem by analysing the structure of distributed systems and their reliance on the environment which they sit upon. It is concluded that the way that Grid applications interact with the infrastructure is not sufficiently addressed and a novel approach is developed in which formal verification methods are integrated with distributed applications development and deployment in a way that includes the environment. This approach allows for reconfiguration

scenarios in distributed applications to proceed in a safe and controlled way, as demonstrated by the development of a prototype application.

▶ Internship Students

- Master 2: Paul Naoumenko : "A component-oriented approach for adaptive and autonomic computing: application to situated autonomic communications" (2006)
- Master 2: Muhammad Uzair Khan: "A Fault-tolerance Mechanism for Future Updates" (2007)
- Master 2 + Enseirb: Boutheina Bannour: "Langage de Reconfiguration pour Composants Distribués" (2008)
- Master 1: Sona Djohou: "Outils pour la preuve formelle de propriétés ASP" (2008)
- Master 2: Justine Rochas: "Request Scheduling for Multiactive Objects" (2013)
- Engineer (Chili): Matias Ibañez: "distributed execution of algorithmic skeletons" (2013), "Support for distributed autonomic components" (2014).

▶ PhD Committees

- Johan Östlund – Uppsala university – Opponent: "Language Constructs for Safe Parallel Programming on Multi-Cores" (2016)
- Sylvain Daillé – Univ. d'Orléans – Reviewer: "Compilation certifiée paramétrée pour la programmation parallèle" (2015)
- Thomas Pinsard – Univ. d'Orléans – Reviewer: "Sections atomiques emboîtées avec échappement de processus légers : sémantiques et compilation" (2014)
- Karl Palmskog – KTH – jury member: "Towards Correct and Efficient Program Execution in Decentralized Networks: Programming Languages, Semantics, and Resource Management" (2014)
- Yann Hodique – Univ. des Sciences et Technologies de Lille – jury member: "Sûreté et optimisation par les systèmes de types en contexte ouvert et contraint" (2007).

▶ Teaching

- Java Card Programming (48h - Master 2),
- Java Card Security (8h - Master 2),
- System programming (54h - ESSI 2nd year),
- C language (42h - ESSI 3rd year)
- Introduction to Programming – C++ (66h - Univ. of Westminster - first year)
- Object Oriented Software Development – Java (44h - Univ. of Westminster - first year)
- Semantics of Distributed and Embedded Systems (approx. 20h, Master 1 - 2009-2011)
- Distributed Systems: an algorithmic approach (approx. 45h, Master 2 - 2009-2015)

Contracts and Collaborations

I have been significantly involved and took responsibilities in the following projects:

▶ NoE CoreGrid

Type: European Network of excellence FP6
Title: The European Research Network of Excellence on Foundations, Software Infrastructures and Applications for large scale distributed, GRID and Peer-to-Peer Technologies
Dates: 2005-2009
Personal responsibility: Coordination of deliverables, local responsible for a workpackage (programming models)
Partners: ERCIM (France). CETIC (Belgium), IPP-BAS (Bulgaria), CNR-ISTI (Italy), CNRS (France), TUD (The Netherlands), EPFL (Switzerland), FhG (Germany), FZJ (Germany), USTUTT (Germany), ICS-FORTH (Greece), INFN (Italy), INRIA (France), KTH (Sweden), MU (Czech R.), PSNC (Poland), STFC (UK), SICS (Sweden), SZTAKI (Hungary), QUB (UK), WWU Muenster (Germany), UNICAL (Italy), UWC (UK), UCHILE (Chili), UCO (Portugal), UCY (Cyprus), Univ. Dortmund (Germany), UCL (Belgium), Univ. of Manchester (UK), UNCL (UK), Univ. Passau (Germany), Univ. Pisa(Italy), HES-SO (Switzerland), Univ. of Westminster (UK), UPC (Spain), VUA (The Netherland), ZIB (Germany), CYFRONET (Poland), Univ. of Innsbruck (Austria)

Summary: The CoreGRID Network of Excellence (NoE) aims at strengthening and advancing scientific and technological excellence in the area of Grid and Peer-to-Peer technologies. To achieve this objective, the Network brings together a critical mass of well-established researchers (161 permanent researchers and 164 PhD students) from forty-one institutions who have constructed an ambitious joint programme of activities. This joint programme of activity is structured around six complementary research areas that have been selected on the basis of their strategic importance, their research challenges and the recognised European expertise to develop next generation Grid middleware, namely:

- knowledge and data management;
- programming models;
- architectural issues: scalability, dependability, adaptability;
- Grid information, resource and workflow monitoring services;
- resource management and scheduling;
- Grid systems, tools and environments.

▶ IP BIONETS

Type: European IP FP6
Title: Bio-inspired Networks and Services.

Personal responsibility: Coordination of deliverables, local responsible for a workpackage
Dates: 2006-2011
Partners: CREATE-NET (Italy), University of Basel (Switzerland), TUB (Germany), University of Passau (Germany), Budapest University of Thechnologie and Economics (Hungary), Nokia Corporation, VTT (Finland), INRIA (France), National and Kapodistrian University of Athens (Greese), Telecom Italia. London School of Economics and Political Science (UK). Sun Microsystems Spain.

Summary: The motivation for BIONETS comes from emerging trends towards pervasive computing and communication environments, where myriads of networked devices with very different features will enhance our communication and tool manipulation capabilities. Traditional communication approaches are ineffective in this context, since they fail to address several new features: a huge number of nodes including low-cost sensing/identifying devices, a wide heterogeneity in node capabilities, high node mobility, the management complexity, the possibility of exploiting spare node resources. Nature and society exhibit many instances of systems in which large populations are able to reach efficient equilibrium states and to develop effective collaboration and survival strategies, able to work in the absence of central control and to exploit local interactions. We seek inspiration from these systems to provide a fully integrated network and service environment that scales to large amounts of heterogeneous devices, and that is able to adapt and evolve in an autonomic way. BIONETS overcomes device heterogeneity and achieves scalability via an autonomic and localised peer-to-peer communication paradigm. Services in BIONETS are also autonomic, and evolve to adapt to the surrounding environment, like living organisms evolve by natural selection. Biologically-inspired concepts permeate the network and its services, blending them together, so that the network moulds itself to the services it runs, and services, in turn, become a mirror image of the social networks of users they serve. This new paradigm breaks the barrier between service providers and users, and sets up the opportunity for "mushrooming" of spontaneous services, therefore paving the way to a service-centric ICT revolution.

▶ FUI OpenCloudWare

`http://www.opencloudware.org/`
Type: Programme d'Investissements d'Avenir - FUI
Dates: 2012-2014
Personal responsibility: Task coordinator
Partners: France Télécom, ActiveEon, Armines, Bull, eNovance, eXoINPT/IRIT, INRIA, OW2, peergreen, PetalsLink, Télécom Paris Tech, Télécom Saint Etienne, Thalès Communication, Thalès Services, Univ. Joseph Fourier/LIG, Univ. de Savoie/LISTIC, UShareSoft.

Summary: The OpenCloudware project aims at building an open software engineering platform for the collaborative development of distributed applications to be deployed on multiple Cloud infrastructures.
The results of OpenCloudware will contain a set of software components to manage the lifecycle

of such applications, from modelling (Think), developing and building images (Build), to a multi-IaaS compliant PaaS platform (Run) for their deployment, orchestration, performance testing, self-management (elasticity, green IT optimisation), and provisioning. Applications will be deployed potentially on multi IaaS (supporting either one IaaS at a time, or hybrid scenarios).The results of the project will be made available as open source components through the OW2 Open Source Cloudware initiative.

▶ Oseo-Isis Spinnaker

`http://www.spinnaker-rfid.com`
Type:
Dates: 2011-2015
Personal responsibility: Participant
Partners: SMEs: Inside-Secure, STIC, Legrand; Academic: IPG, ENS des Mines de St Etienne, Un. du Maine, Un, F. Rabelais Tours, AETS ESEO Angers, Un. Marne la Vallée, Un. Paris 6, Un. Rennes 1, INRIA.

Summary: The objective of Spinnaker is to really allow RFID technology to be widely and easily deployed. The role of the OASIS (now SCALE) team in this project is to allow the wide scale deployment and management of the specific RFID application servers in the cloud, so to build an end-to-end robust and flexible solution using GCM technology.

▶ Associate Team SCADA

`http://team.inria.fr/SCADA`
Type: INRIA - Associate team
Dates: 2012-2014
Personal responsibility: Project coordinator
Partners: OASIS/SCALE, NIC-Labs (Chile).

Summary: Besides a formal collaboration between NIC Labs and OASIS team (and now the SCALE team), the aim of the project is to contribute to programming models and languages for programming, running and debugging parallel and distributed applications. For this we will contribute both from at theoretical and practical perspectives to the design of languages, and their implementation and formalisation. In this project we will focus on composition models allowing to put together individual sequential code into complex applications featuring parallelism and distribution. More precisely we focus on two such composition models: algorithmic skeletons and software components.

▶ Associate Team DAESD

`http://team.inria.fr/DAESD`
Type: INRIA - Associate team
Dates: 2012-2014
Personal responsibility: Participant

Partners: OASIS/SCALE and AOSTE team from INRIA/CNRS/Univ. Nice Sophia Antipolis, East China Normal University (ECNU) Shanghai.

Summary: The aim of the DAESD associate team is to build models, methods, and prototype tools inheriting from synchronous and asynchronous models. We plan to address modelling formalisms and tools, for this combined model; to establish a method to analyze temporal and spatial consistency of embedded distributed real-time systems; to develop scheduling strategies for multiple tasks in embedded and distributed systems with mixed constraints.

I also participated to the following projects: GCPMF (ANR - 2006-2008), GridCOMP (EU FP6-Strep - 2006-2009), Reseco (Stic-Amsud - 2006-2009), MCorePHP (ANR blanc international - 2010-2012).

Other activities

• Program committee: *FMOODS/DAIS 2003 Student Workshop*, *FOCLASA* 2009 to 2013, *FESCA* 2009 to 2013, *ICE* workshop 2013 to 2015, *PDP/4PAD* 2016, *AGERE* 2015, Sophia Antipolis Formal analysis local workshops.

• Program committee chair of *ICE* workshop 2016.

• Reviews for many other conferences, and many journal reviews, including the following journals: SCP, TCS, MSCS, TOPLAS, ComSIS, DIST, STVR, SPE.

• Member of the Scientific Advisory board of the Envisage European project (FP7).