Curriculum Vitae

Laurent Tournier

Born April 2, 1979
French nationality

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Research interests

- Modelling of biological systems (genetic and metabolic regulatory networks)
- Mathematical and algorithmic analysis of continuous, discrete and hybrid systems

Current Position

since Sept 2006 — **Post-doctoral researcher, INRIA** (French National Institute for Computer Science and Control), Sophia-Antipolis, France.
Team: COMORE (Modelling and Control of Renewable Resources).

Education

2001 – 2005 — **Ph.D., Applied Mathematics**
Institut National Polytechnique de Grenoble (INPG), Laboratoire Jean Kuntzmann (LJK).

2000 – 2001 — **Master of Science, Applied Mathematics**, with honours.
Université Joseph Fourier, Grenoble, France.

1998 – 2001 — **Diplôme d'ingénieur (M.Sc.) ENSIMAG**, with honours.
French Superior School of Computer Science and Applied Mathematics, Grenoble, France.

Research experience

Sept 06 – Aug 08 — Post-doctoral Researcher, INRIA Sophia-Antipolis, France.
Project/Team: COMORE (Modelling and Control of Renewable Resources).
Advisor: Jean-Luc Gouzé.
Main research topic: *Mathematical analysis of gene regulatory models.*

Oct 01 – Nov 05 — Ph.D. student, Laboratoire Jean Kuntzmann (LJK), previously named: Modelling and Computation Laboratory (LMC), Grenoble, France.
Scholarship: MENRT (granted by the french *Ministère de la Recherche*).
Advisor: Jean Della Dora.
Title: *Mathematical modelling of genetic and metabolic regulatory networks.*
Keywords: dynamical systems, ordinary differential equations, hybrid systems, boolean networks, systems biology, S-systems, network identification.

Thesis defence: November 30, 2005. Committee members:

Anestis Antoniadis,	Prof., Université Joseph Fourier, France	President
Albert Sorribas,	Prof., Lleida University, Spain	Reviewer
Léon Brenig,	Prof., Université Libre de Bruxelles, Belgium	Reviewer
Arnaud Tonnelier,	*Chargé de Recherche*, INRIA Lorraine, France	Examiner
Jean Della Dora,	Prof., INPG, Grenoble, France	Supervisor

Mar 01 – June 01 M.Sc. thesis: *Models of gene regulatory networks*, Laboratoire LJK, Grenoble, France. Advisor: Jean Della Dora.

June 00 – Sept 00 Engineering internship in CNRS (French National Center for Scientific Research), at the CRIC (Network Management Center), Grenoble, France.
Subject: Programming of a web interface to help the distribution of internal access of DNS.

Teaching experience

Oct 04 – Aug 06 Teaching assistant (french *ATER*) in **Computer Science**.
Université Pierre Mendès-France, Grenoble, France.
Main courses:

- *Database*, theoretical and practical undergraduate course.
- *Basic computer skills*, undergraduate courses.

Oct 01 – Sept 04 Instructor (french *Moniteur*) in **Computer Science**.
Université Pierre Mendès-France, Grenoble, France.
Main courses:

- *Algorithms and Programming Languages*, graduate and undergraduate courses. (programming languages: `Java`, `Ada`, `Scheme`)
- *Basic computer skills*, undergraduate courses.

2005 – 2006 Participation in the development of an educational web-site for certification of basic computer skills. C2i project, Université Pierre Mendès-France.
web: `http://www.upmf-grenoble.fr/74353274/0/fiche___pagelibre/` (in french).

2003 – 2005 Isolated lectures in graduate courses of *Hybrid Systems* and *Dynamical Networks* (common courses of Université Joseph Fourier and ENSIMAG).

Research projects

2006 – 2007 **Hygeia** - Hybrid Systems for Biochemical Network Modeling and Analysis.
European project, *New and Emerging Science and Technology* (NEST 4995).
Participants: ETH (Switzerland), INRIA (France), University of Patras (Greece), EMBL (Germany), Rockefeller University (NYC, USA), Università di Pavia (Italy).
Coordinator: John Lygeros, Professor, ETH Zürich, Switzerland.

2004 – 2006 **CalCel** (Calcul cellulaire), French project funded by the "Région Rhône-Alpes", LJK, Grenoble, France. Coordinator: Jean Della Dora.

Other professional activities

Summer 2007 Co-advisor of a master student (Université de Nice) in a summer internship (INRIA).
Title: *A new approach for the analysis of linear and Lotka-Volterra systems.*

2007	Reviewer for *IEEE Transactions on Biomedical Circuits and Systems*.
2003 – 2005	Participation in the organization of the "Fête de la Science", a French popularizing scientific event, dedicated to a wider public.

Summer schools

Spring 2004	EJCACF (French school for junior researchers in Computer Algebra), Grenoble, France.
Spring 2004	Lecture week on *Chaos in Mathematics*. Organized by the Université Joseph Fourier, Grenoble, France..
Summer 2002	ESMTB (European Society for Mathematical and Theoretical Biology) summer school: *Dynamical Systems in Physiology and Medicine*, Urbino (Italy).

Areas of competence

Mathematics

- Ordinary differential equations and differential inclusions,
- Dynamical systems (both discrete and continuous),
- Hybrid systems,
- Mathematical modelling of biological systems (Systems Biology).

Soft skills

- *Operating systems*: UNIX/LINUX, Windows.
- *Programming langages*: `Java, Ada95, Scheme` (see *teaching experience*), `C`.
- *Mathematical softwares*: `Matlab` (including `Simulink`), `Maple`. Notions of `Scilab`.
- *Common tools*: Latex, MS Office, OpenOffice.

Languages

- *French*: native.
- *English*: good writing and speaking skills.
- *Italian*: need some reactivation.

References

• **Jean-Luc Gouzé**, Senior Researcher (Directeur de Recherche), INRIA.
Leader of the group COMORE.

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• **Jean Della Dora**, Professor, INPG

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38041 Grenoble Cedex 9, France

e-mail: `Jean.Delladora@imag.fr`

Publications

Most of my preprints and reports are available on my web page :
`http://www-sop.inria.fr/comore/personnel/Laurent.Tournier/`

Refereed journals

2008 L. Tournier, J.-L. Gouzé, *Hierarchical analysis of piecewise affine models of gene regulatory networks,* Theory in Biosciences, 127 : 125–134 (2008).

2008 L. Tournier, J.-L. Gouzé, *Qualitative stability patterns for Lotka-Volterra systems on rectangles,* Hybrid Systems : Computation and Control, HSCC 2008, LNCS 4981, pp 662–665 (2008).

Refereed international conference proceedings

Oct 2007 L. Tournier, J.-L. Gouzé, *Hierarchical analysis of piecewise affine models of gene regulatory networks,* Proc. of ECCS'07 (European Conference on Complex Systems), Dresden (Germany), 2007. (Acceptance rate : $\sim 33\%$).

July 2005 L. Tournier, *Approximation of dynamical systems using S-systems theory : application to biological systems,* Proc. of ISSAC'05 (International Symposium on Symbolic and Algebraic Computation), Beijing, China, pp 317 – 324, ACM Press, 2005. (Acceptance rate : $\sim 43\%$).

Mar 2006 J. Della Dora, A. Maignan, L. Tournier, *Dynamical systems, an algorithmic point of view,* Proc. of *Transgressive Computing*, Granada (Spain), 2006.

Work in progress

in prep. L. Tournier, M. Chaves, *Asynchronous boolean models of gene networks, application to an Apoptosis Signalling Pathway.*

in prep. L. Tournier, J.-L. Gouzé, *Towards a qualitative analysis of Lotka-Volterra equation.*

Dissertations

Nov 2005 L. Tournier, *Etude et modélisation mathématique de réseaux de régulation génétique et métabolique*, Thèse de doctorat (Ph.D. Thesis), LMC-IMAG, 2005.

June 2001 L. Tournier, *Etude et modélisation de réseaux de régulation génétiques*, Rapport de DEA (M.Sc. Thesis), LMC-IMAG, 2001.

Research reports

Nov 2007 L. Tournier, J.-L. Gouzé, *Qualitative stability patterns for Lotka-Volterra systems on rectangles,* Research report INRIA, RR-6346, 2007. `http://hal.inria.fr/inria-00186247`

Jan 2007 L. Tournier, J.-L. Gouzé, *Hierarchical analysis of piecewise affine models of gene regulatory networks*, Research report INRIA, RR-6189, 2007. `http://hal.inria.fr/inria-00145357`

Dec 2006 L. Tournier, J.-L. Gouzé, *Deterministic hierarchical modeling of biochemical networks*, Deliverable D1.3, European Project HYGEIA (Hybrid Systems for Biochemical Network Modeling and Analysis, NEST 4995) `http://www.hygeiaweb.gr/home.html`

Dec 2006 — M. Souren, L. Ettwiller, J. Wittbrodt, L. Tournier, J.-L. Gouzé, *Report on biochemical parameters and modeling of the Six3 transcriptional network*, Deliverable n^o D5.3, European Project HYGEIA (Hybrid Systems for Biochemical Network Modeling and Analysis, NEST 4995) `http://www.hygeiaweb.gr/home.html`

Dec 2002 — L. Tournier, E. Farcot, *Hybrid model of gene regulatory networks, the case of the lac-operon*, Research report LMC-IMAG, 2002.

Selected presentation and seminars

Oct 2007 — L. Tournier, *Hierarchical analysis of piecewise affine models of gene regulatory networks,* ECCS'07 (European Conference on Complex Systems), Dresden, Germany. Video available at : `http://videolectures.net/eccs07_tournier_hap/`

Feb 2007 — L. Tournier, *Deterministic hierarchical modeling of biochemical networks*, European Project HYGEIA Meeting, ETH Zürich, Switzerland.

July 2006 — L. Tournier, *Modèles mathématiques de régulation génétique*, COMORE Team seminar, INRIA Sophia-Antipolis.

July 2005 — L. Tournier, *Approximation of dynamical systems using S-systems theory : application to biological systems*, ISSAC'05, Beijing, China.

Apr 2004 — L. Tournier, *Modèles hybrides de systèmes de régulation biologiques*, EJCACF (Young researcher in Computer Algebra Spring School), Grenoble, France.

Jan 2003 — L. Tournier, *Vers la compréhension de la régulation génétique : modèle hybride de l'opéron lactose*, MOSAIC Team seminar, Laboratoire LJK, Grenoble, France.

Jan 2002 — L. Tournier, E. Farcot, *Piecewise linear models for genetic networks*, Computation and Control Workshop Meeting, Grenoble, France.

Some past and present collaborations

since 2006 — INRIA Sophia-Antipolis, COMORE Team (Modelling and Control of Renewable Resources). Main co-workers : J.-L. Gouzé, Senior Researcher (*Directeur de Recherche*), INRIA, M. Chaves, Research Scientist (*Chargé de Recherche*), INRIA.

2006 – 2007 — European project HYGEIA (Hybrid Systems for Biochemical Network Modeling and Analysis, NEST 4995), coordinated by J. Lygeros (ETH Zürich).
I worked in particular with J. Wittbrodt team (Biologists at EMBL, Heidelberg, Germany).

2001 – 2005 — Different working groups during my Ph.D., among which :
Biopuces : coordinated by A. Antoniadis (Prof. Université de Grenoble).
Arabidopsis : G. Curien, Research Scientist (biologist) at CEA Grenoble, E. Farcot, Research Scientist (*Chargé de Recherche*), INRIA.