
PUBLICATIONS AND TOOLS

Software

1. *Breach (main developer)* : a toolbox for systematic simulation of hybrid dynamical system, supporting signal temporal logic (STL) specifications
2. *CPSGrader (main developer)* : UC Berkeley autograder for Cyber-Physical Systems
3. *SpaceEx (contributor)* : modeling and reachability analysis for hybrid systems
4. *EVL (contributor)* : a library for multi-methods in C++

Patents

1. X. Jin, A. Donzé, J. Deshmukh, S. A. Seshia, *Systems and Methods for Mining Temporal Requirements from Block Diagram Models of Control Systems*, U.S. Patent Application No. 13/651,961

Peer-reviewed Articles in International Journals

1. Jin X., Donzé A., Deshmukh J. V., Seshia S. A., *Mining Requirements from Closed-Loop Control Models*, Transactions on Computer-Aided Design of Integrated Circuits and Systems, accepted with minor revisions
2. Legoc Y. and Donzé A., *EVL, A Framework for Multi-Methods in C++*, Science of Computer Programming, 2015
3. Pourcelot, E., Mobilia, N., Donzé, A., Maler, O., Mossuz, P., Fanchon, E., *Cellular iron regulation in animals : need and use of suitable models*, Nutzen-Risiko-Bewertung von Mineralstoffen und Spurenelementen : Biochemische, physiologische und toxikologische Aspekte, KIT Scientific Publishing, 2014
4. Nuzzo P., Xu H., Ozay N., Finn J. B., Sangiovanni-Vincentelli A. L., Murray R. M., Donzé A., Seshia S. A., *A Contract-Based Methodology for Aircraft Electric Power System Design*, IEEE Access, 2014
5. Stoma S., Donzé A., Bertaux F., Maler O., Batt G., *STL-based analysis of TRAIL-induced apoptosis challenges the notion of type I/type II cell line classification*, PLoS Computational Biology, 2013
6. Donzé A., Fanchon E., Gattepaille L., Maler O., Tracqui P., *Robustness Analysis and Behavior Discrimination in Enzymatic Reaction Networks*, PLoS ONE, 2011
7. Donzé A., Langmead C. J., Clermont G., *Parameter Synthesis in Nonlinear Dynamical Systems : Application to Systems Biology*, Journal of Computational Biology, 2010
8. Clarke E. M., Donzé A., Legay A., *On Simulation-Based Probabilistic Model Checking of Mixed-Analog Circuits*, Formal Methods in Systems Design, 2009.

Peer-reviewed Articles in Conference Proceedings

1. Raman V., Donzé A., Sadigh D., Murray R. M., Seshia S. A., *Reactive Synthesis from Signal Temporal Logic Specifications*, Hybrid Systems Computation and Control, HSCC'15
2. Raman V., Donzé A., Maasoumy M., Murray R. M., Sangiovanni-Vincentelli A., Seshia S. A., *Model Predictive Control with Signal Temporal Logic Specifications*, Conference on Decision and Control, CDC'14
3. Juniwal G., Donzé A., Jensen J. C., Seshia S. A., *CPSGrader : Synthesizing Temporal Logic Testers for Auto-Grading an Embedded Systems Laboratory*. International Conference on Embedded Software, EMSOFT'14
4. Donzé A., Valle R., Akkaya I., Libkind S., Seshia S. A., and Wessel. D. *Machine Improvisation with Formal Specifications*, International Computer Music Conference,ICMC'14
5. Donzé A., Ferrère T., Maler O., *Efficient Robust Monitoring of Signal Temporal Logic*, Computer Aided Verification,CAV'2013,

6. Jin X., Donzé A., Deshmukh J., Seshia S., *Mining Requirements from Closed-Loop Control Models*, Hybrid Systems Computation and Control, HSCC'13
7. Donzé A., Frehse G., *Modular, Hierarchical Models of Control Systems in SpaceEx*, European Control Conference, ECC'13
8. Bogomolov S., Donzé A., Frehse G., Grosu R., Johnson T. T., Ladan H., Podelski A., Wehrle M., *Abstraction-Based Guided Search for Hybrid Systems*, SPIN'13
9. Mobilia N., Donzé A., Fanchon E., Moulis J. M., *Producing a Set of Models for the Iron Homeostasis Network*, Hybrid Systems in Biology, HSB'13
10. Donzé A., Maler O., Bartocci E., Nickovic D., Grosu R., Smolka S., *On Temporal Logic and Signal Processing*, ATVA'12
11. Mobilia N., Donzé A., Fanchon E., Moulis J. M., *A Model of the Cellular Iron Homeostasis Network Using Semi-Formal Methods for Parameter Space Exploration*, Hybrid Systems in Biology, HSB'12
12. Asarin E., Donzé A., Maler O., Nickovic D. *Parametric Identification of Temporal Properties*, Runtime Verification, RV'11
13. Frehse G., Le Guernic C., Donzé A., Ray R., Lebeltel O., Ripado R. , Girard A., Dang T. , Maler O., *SpaceEx : Scalable Verification of Hybrid Systems*, Computer Aided Verification (CAV'11)
14. Donzé A., Maler O., *Robust Satisfaction of Temporal Logic over Real-Valued Signals*, Formal Modelling and Analysis of Timed Systems, FORMATS'10
15. Donzé A., *Breach, A Toolbox for Verification and Parameter Synthesis of Hybrid Systems*, Computer Aided Verification, CAV'10
16. Jha S. K., Donzé A., Paul R., Dutta-Moscato J., Mi Q., Clermont G., Vodovotz Y., Langmead C. J., *Parameter Estimation and Synthesis for Systems Biology : New Algorithms for Nonlinear and Stochastic Models*, 9th International Conference on Complexity in Acute Illness, ICCAI'10
17. Donzé A., Langmead C. J., Clermont G., Legay A., *Parameter Synthesis in Nonlinear Dynamical Systems : Application to Systems Biology*, Research in Computational Molecular Biology, RE-COMB'09
18. Donzé A., Krogh B., Rajhans A., *Parameter Synthesis for Hybrid Systems with an Application to Simulink Models*, Hybrid Systems Computation and Control, HSCC'09
19. Clarke E. M., Donzé A., Legay A., *Statistical model checking of mixed-analog circuits with an application to a third-order delta-sigma modulator*, Haifa Verification Conference HVC'08 (**Best Paper Award**)
20. Kapinski J. P., Lerda F., A. Donzé, B. Krogh, H. Maka, S. Wagner, *Control software model checking using bisimulation functions for nonlinear systems*, Conference on Decision and Control CDC'08
21. Dang T., Donzé A., Maler O., Shalev *Sensitive state space exploration N.*, Conference on Decision and Control, CDC'08
22. Donzé A., Maler O., *Systematic Simulation using Sensitivity Analysis*, Hybrid Systems Computation and Control, HSCC'07
23. Donzé A., *On Temporal Differences Algorithms For Continuous Systems*, International Conference on Informatics in Control, Automation and Robotics, ICINCO'05
24. Dang T., Donzé A., Maler O., *Verification of Analog and Mixed Signal Circuits using Hybrid Systems Techniques* Formal Methods in Computer-Aided Design, FMCAD'04

Workshop

1. Aksanli B., Akyurek A. S., Behl M., Clark M., Donzé A., Dutta P., Lazik P., Maasoumy M., Mangharam R., Nghiem T. X., Raman V., Rowe A., Sangiovanni-Vincentelli A., Seshia S. A., Simunic-Rosing T., Venkatesh J., *Distributed control of a swarm of buildings connected to a smart grid : demo abstract*, 1st ACM Conference on Embedded Systems for Energy-Efficient Buildings, 2014

2. Raman V., Donzé A., Maasoumy A., *Model Predictive Control from Signal Temporal Logic Specifications : A Case Study (Work in Progress)*, Design, Modeling and Evaluation of Cyber Physical Systems (CyPhy'14)
3. Jin X., Donzé A., Ciardo G., *Mining Weighted Requirements from Closed-Loop Control Models*, Numerical Systems Verification, NSV'13
4. Donzé A., Libkind S., Seshia S., Wessel D., *Control Improvisation with Application to Music*, First International Workshop on the Swarm at the Edge of the Cloud, SEC'13
5. Donzé A., *Parameter Synthesis for Mixed-Signal Circuits using Numerical Optimization*, Frontiers in Analog Circuit (FAC) Synthesis and Verification, Workshop of CAV'2011
6. E. M. Clarke, A. Donzé, A. Legay *Statistical model checking of mixed-analog circuits*, Formal Verification of Analog Circuits, Workshop of CAV'2008

Technical Reports

1. A. Donzé, S. Libkind, S. A. Seshia, D. Wessel, *Control Improvisation with Application to Music*, Technical Report No UCB/EECS-2013-183
2. T. Dang, P. Caspi, A. Donzé, G. Frehse, A. Girard, C. Le Guernic, O. Maler, T. Nahhal, and D. Nickovic. *Research report on static verification of analog design* Prosyd Deliverable D3.2/18, VERIMAG, 2007
3. T. Dang, A. Donzé, O. Maler, D. Nickovic and A. Pnueli. *Research report on timed/analog synthesis* Prosyd Deliverable D2.2/5, VERIMAG, 2007
4. A. Donzé. *On Temporal Differences Algorithms For Continuous Systems* Verimag Technical Report number TR-2005-8, May 2005
5. A. Donzé, S. Shapero. *Search Methods Based Control of the Simplified Model of the ABB Power Network*, Verimag Technical Report number TR-2005-6, Mar 2005

Thesis

1. Donzé A. (2007), *Trajectory-based verification and controller Synthesis for continuous and hybrid systems*, PhD thesis, University Joseph Fourier, Grenoble, 2007
2. Donzé A., *Étude d'un modèle de contrôleur hybride*, Master's thesis, DEA Informatique : Systèmes et Communication, Université Joseph Fourier, Grenoble, 2003
3. Donzé A. (2002), *Influence des paramètres dans l'apprentissage par renforcement*, Master's thesis, DEA Mathématiques Appliquées, Université Joseph Fourier, Grenoble, 2002

RESEARCH ACTIVITIES

Workshop Organizer

- Toward Systems Biology (TSB'11), Grenoble, France, May 2011, co-organized with O. Maler and E. Fanchon

Program Committee Member

- Runtime Verification (RV'15)
- Hybrid Systems : Computation and Control (HSCC'13, HSCC'14, HSCC'15)
- Formal Modeling and Analysis of Timed Systems (FORMATS'13, FORMATS'14)
- Modelisation of Reactive Systems (MSR'11, MSR'13)
- Summer Simulation Multi-Conference (SummerSim'14)
- Hybrid Systems in Biology (HSB'12, HSB'13, HSB'14)
- Design, Modeling and Evaluation of Cyber Physical Systems (CyPhy'14)
- Synthesis of Continuous Parameters (SynCoP'14)
- Applied Verification for Continuous and Hybrid Systems (ARCH'14, ARCH'15)

Peer-reviewing

I served as a reviewer for more than 100 articles submitted to journals and conferences, including :

- *Journals* : IEEE Transactions on Automatic Control, PloS One , International Journal of Robust and Nonlinear Control , Discrete Event Dynamic Systems , Journal of Selected Topics in Signal Processing , IEEE Transactions on Computational Biology and Bioinformatics , Information and Computation , ACM Transactions on Design Automation of Electronic Systems , European Journal of Control
- *Conferences and Workshops* : NASA Formal Methods (NFM'14) , International Conference on Robotics and Automation (ICRA'12, ICRA'13) , Principle of Programming Languages (POPL'13) , SPIN workshop (SPIN'13) , European Control Conference (ECC'13, ECC'14) , International Conference on Embedded Software (EMSOFT'13) , Workshop on Hybrid Autonomous Systems (HAS'13) , Quantitative Evaluation of Systems (QEST'12) , Computational Methods in Systems Biology (CMSB'11) , Verification, Model Checking, and Abstract Interpretation (VMCAI'12) , Euromicro Conference on Real-Time Systems (ECRTS'11) , Conference on Decision and Control (CDC'10) , Nonlinear Control Systems (NOLCOS'10) , Computer Aided Verification (CAV'10, CAV'11, CAV'13, CAV'15) , American Control Conference (ACC'09, ACC'13, ACC'14) , Hybrid Systems : Computation and Control (HSCC'04, HSCC'05, HSCC'06, HSCC'07, HSCC'12) , Formal Modeling and Analysis of Timed Systems (FORMATS'06, FORMATS'11) , Application of Concurrency to System Design (ACSD'04)

SELECTED TALKS

As invited speaker

1. 1st International Workshop on Synthesis of Continuous Parameters, Grenoble, 2014
2. ExCape Summer School on Synthesis, *Requirement Synthesis for Industrial-scale Control Systems Design*, Berkeley, June 2013
3. XXXI^{ème} Séminaire de la Société Francophone de Biologie Théorique, *Quantitative Temporal Logics for Systems Biology*, Autrans, 2011
4. Workshop on Identification and Control of Biological Interaction Networks, *Quantitative Temporal Logics for Systems Biology*, INRIA Rhône Alpes, Grenoble, 2011
5. Workshop on MetaModelling of multiscale systems, *Parameter Synthesis in Systems Biology*, Center of Integrative Genetics, University of Life Sciences, Aas, Norway, 2010

Tutorials

1. Third International Workshop on Hybrid Systems Biology HSB'14, Vienna, 2014, *Parameter Synthesis in Systems Biology*
2. International Conference on Runtime Verification 2013 (RV'13), *On Signal Temporal Logic* , Rennes, France, 2013
3. Sixth International Workshop on Numerical Software Verification (NSV'13), *Breach Toolbox : Instrumenting Simulation and Signal Temporal Logics for the Analysis of Hybrid Systems*, CPS Week, Philadelphia, 2013

Conference Attendance with Oral Presentation

SEC'13, ATVA'12, RV'11, CAV'11, FORMATS'10, CAV'10, RECOMB'09, HSCC'09, HVC'08, FAC'08, CDC'08, HSCC'07, ICINCO'05

TEACHING ACTIVITIES

- Fall 2014 **Guest Lecturer EECS149/249A, Formal Methods for Engineering Education**
— 1h30 lecture on *Using Temporal Logic in Autograders*
- Fall 2014 **edX 149.1x Cyber-Physical System (MOOC)**
— Main developer of the virtual lab and autograder, used by about 500 students
- Spring 2014 **Guest Lecturer EECS 294-98, Formal Methods for Engineering Education**
— 3h lecture on *Signal Temporal Logic*
- Fall 2013 **Guest Lecturer EECS 144/244, Fundamental Algorithms for System Modeling, Analysis, and Optimization**
— 2h lecture on *Signal Temporal Logic*
- Spring 2013 **Co-responsible on EECS 144/244, Fundamental Algorithms for System Modeling, Analysis, and Optimization** (University of California, Berkeley),
— 12h lecture (hybrid, continuous and stochastic systems, Signal Temporal Logic)
- 2010-2011 **Teaching assistant in Embedded Systems** (ENSIMAG Engineering School)
— 18h of control systems implementation
- 2009-2011 **Teaching assistant in Computer Science** (University of Grenoble I)
— 64h of introduction to algorithmics, Unix environment and the C prog. language
— 60h of introduction to logics for computer science
— 20h of software engineering (end of semester project)
- 2003-2006 **Teaching Assistant in Mathematics** (University of Savoie)
— 62 h of Elementary Algebra and Geometry ;
— 86 h of Calculus ;
— 36 h of Numerical Analysis ;
— 12 h of Elementary Statistics.
- 2003 **Teaching Assistant in Mathematics** (University of Grenoble I)
— 35h of Elementary Algebra and Geometry

Students

- Shromona Ghosh, *Online Monitoring of Signal Temporal Logics*, EECS 144/244 project, Fall 2013
- Akhil Neti, Nikhil Neti, Oren Berkowitz, Andrew Kwong, *Real-Time Music Improvisation*, EECS 149 (Introduction to Embedded Systems), Fall 2013
- Sophie Libkind, *Control Improvisation with Application to Music*, intern within SUPERB (Summer Undergraduate Program in Engineering Research at Berkeley), **selected to participate at the Conference of Research Experiences for Undergraduates Student Scholarship, October 27-28, 2013, Arlington, Virginia.**