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# Laurent Michel

## Professional Experience

- |                       |  |                  |
|-----------------------|--|------------------|
| 08/01/2018-Present    | <ul style="list-style-type: none"><li>• Professor<br/>co-Director for Comcast Center of Excellence for Security Innovation<br/>Director for Synchrony Cybersecurity Center<br/>co-Director for Connecticut Cybersecurity Center<br/>Computer Science &amp; Engineering<br/>UNIVERSITY OF CONNECTICUT</li></ul>   | Storrs, CT       |
| 08/23/2017-07/31/2018 | <ul style="list-style-type: none"><li>• Professor<br/>Associate Department Head<br/>co-Director for Comcast Center of Excellence for Security Innovation<br/>Director for Synchrony Cybersecurity Center<br/>co-Director for Connecticut Cybersecurity Center<br/>Computer Science &amp; Engineering<br/>UNIVERSITY OF CONNECTICUT</li></ul>           | Storrs, CT       |
| 08/23/2014-2017       | <ul style="list-style-type: none"><li>• Associate Professor<br/>Associate Department Head<br/>co-Director for Comcast Center of Excellence for Security Innovation<br/>Director for Synchrony Cybersecurity Center<br/>co-Director for Connecticut Cybersecurity Center<br/>Computer Science &amp; Engineering<br/>UNIVERSITY OF CONNECTICUT</li></ul> | Storrs, CT       |
| 08/23/2008-2014       | <ul style="list-style-type: none"><li>• Associate Professor<br/>Castleman Term Professor in Engineering Innovation<br/>Computer Science &amp; Engineering<br/>UNIVERSITY OF CONNECTICUT</li></ul>  | Storrs, CT       |
| 08/23/2002-08/22/2008 | <ul style="list-style-type: none"><li>• Assistant Professor<br/>Computer Science &amp; Engineering<br/>UNIVERSITY OF CONNECTICUT</li></ul>   | Storrs, CT       |
| 2000-2002             | <ul style="list-style-type: none"><li>• Visiting Assistant Professor<br/>Computer Science Department<br/>BROWN UNIVERSITY</li></ul>  | Providence, RI   |
| 1999-2000             | <ul style="list-style-type: none"><li>• Developer, manager for OPLStudio<br/>Ilog, S.A.</li></ul>  | Gentilly, France |
| 1995-1999             | <ul style="list-style-type: none"><li>• Teaching and Research assistant<br/>Computer Science Department<br/>BROWN UNIVERSITY</li></ul>   | Providence, RI   |

## Education

- 1999 • Ph.D. in Computer Science  
*Localizer: A Modeling Language for Local Search* Advisor: Pascal Van Hentenryck. Department of Computer Science, Brown University, Providence, RI
- 1997 • M.Sc. in Computer Science  
*Numerica: A Modeling Language for Global Optimization* Advisor: Pascal Van Hentenryck. Department of Computer Science, Brown University Providence, RI
- 1993 • B.S. & M.Sc. in Computer Science  
*Generic Abstract Interpretation Algorithms for Logic Programs.* Advisor: Baudouin Le Charlier. Institut d'Informatique Facultés Universitaires Notre-Dame de la Paix Namur, Belgium

## Leadership

### DEPARTMENT

- 2014-2018 1. Associate Department Head, Computer Science & Engineering.  
 2015 2. Security Search Committee Chair [100 applicants, 4 hires]  
 2015 3. Minor in Business Analytics in concertation with the Business school. Program development during Fall 2015.
- 2014-present 4. C&C, new concentration-based programs.  
 2014 5. Course coordination for UTC-IASE  
 2015 6. CSE3150: C++ Essentials. New course, flipped.  
 2014 7. CSE3100: System Programming. New course.

### DEVELOPMENT

- 2015 8. Hartford Steam Boiler engagement.  
 2015 9. UTC Engagement (Alison Gotkin).  
 2015 10. Synchrony Financial engagement (3.2M).  
 2014 11. ACM consortium engagement. (Security).

### CENTERS

- 2017-present 12. Synchrony Center. Co-director. 3.2M
- 2014-present 13. Comcast Center for Excellence in Security Innovation. Co-director. 1.5M annually.
- 2015 14. Academic Plan Proposal. Connecticut Cybersecurity Center:  $C^3$ . Proposal funded (1 faculty line). Joint effort with ECE.

## Research Foci

### CONSTRAINT PROGRAMMING

- Constraint Programming is concerned with the creation of algorithmic techniques, methods and tools to tackle hard combinatorial optimization problems. My main research theme is to design languages and implementations that automate difficult and error-prone tasks. Those stem from writing and maintaining optimization models for solvers using either complete, incomplete or hybrid techniques. I have been actively engaged in the development of multiple such systems, including NUMERICA, OPL, COMET. The COMET system in particular embodied many novel ideas and results. NUMERICA and OPL are commercialized by IBM. The most recent contributions led to the creation of OBJECTIVE-CP, an open-source optimization platform.

### VOTING TECHNOLOGY & SECURITY

- I am a founding member of the UCONN Voting Technology Research Center in which I bring my expertise in software engineering and hardware. We evaluate voting technologies, find weaknesses or attack vectors and develop processes for auditing and testing electronic voting equipment. Recent publications falling under this umbrella include papers at EVT ACSAC and IEEE that can be found at the center site <http://voter.engr.uconn.edu>.
- I am co-Director of the Comcast Center for Excellence in Security Innovation (CSI), Synchrony Center and  $C^3$ . The mission of these centers is to advance the state of the art in security solutions relevant to business units within Comcast (CSI), Synchrony Financial or CT companies at large ( $C^3$ ). The centers conduct penetration testing, security assessment of network protocols, virtualization efforts and embedded device security.

## Honors and Professional Activities

### AWARDS

- Connecticut Academy of Science and Engineering Inductee, 2018. <https://goo.gl/ESoieT>.
- NSF CAREER Award, “Synthesis of Search Procedures for Constraint Programs”, 2007-2012.
- Outstanding Teaching Faculty Award, CSE Department, 2004.
- Best Paper Award: P. Van Hentenryck and L. Michel. Control Abstractions for Local Search *Ninth International Conference on Principles and Practice of Constraint Programming (CP’03)*, Kinsale, County Cork, Ireland, October 2003.
- Distinguished Paper Award: P. Van Hentenryck and L. Michel. Constrained Based Combinators for Local Search. *10<sup>th</sup> International Conference on Principles and Practice of Constraint Programming (CP04)*, Toronto, Canada, September 2004.

### ACTIVITIES

- President of the Association for Constraint Programming (International Organization). 3 year term. 2015-2018. <http://www.a4cp.org>.
- Associate Editor for MPC 2010-present. <http://link.springer.com/journal/12532>.
- Associate Editor for Constraints (6 year term, non-renewable) [2009-2015].
- Program Committee Member for AAAI 2016,2015,2014,2013.
- Program Committee Member for the *International Conference on Principles and Practice of Constraint Programming* in 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016.

## Honors and Professional Activities (continued)

- Program Chair for *International Conference on the integration of Techniques from Constraint Programming, Artificial Intelligence and Operations Research (CPAIOR)* in 2015.
- Program Committee Member for *International Conference on the integration of Techniques from Constraint Programming, Artificial Intelligence and Operations Research (CPAIOR)* in 2007, 2008, 2009, 2010, 2011, 2013, 2014, 2015, 2016.
- Conference Chair for the *International Conference on Principles and Practice of Constraint Programming* in 2007
- Program Committee Member for *Practical Aspects of Declarative Languages* in 2005
- Local Chair for *New England Programming Languages and Systems Symposium Series* in 2003
- co-Organizer CP-Tools 2006 held in conjunction with CP'06.

### OUTREACH

- *Engineering 2000*, School of Engineering, University of Connecticut, Summers 2004, 2006, 2007
- *DaVinci*, School of Engineering, University of Connecticut, <http://www.engr.uconn.edu/davinci/> Summer 2006.

## Publications

### BOOKS

1. P. Van Hentenryck, L. Michel, Y. Deville *Numerica. A Modeling Language for Global Optimization*. MIT Press, Cambridge, London.
2. P. Van Hentenryck, L. Michel *Constraint-Based Local Search*. MIT Press, Cambridge, London.

### EDITED BOOKS

3. L. Michel *Integration of AI and OR Techniques in Constraint Programming - 12th International Conference, CPAIOR 2015, Barcelona, Spain, May 18-22, 2015, Proceedings*. Lecture Notes in Computer Science 9075, Springer 2015, ISBN 978-3-319-18007-6.

### BOOK CHAPTERS

4. Michel, L. and Van Hentenryck, P. Constraint-Based Local Search, *Handbook of Heuristics*, pp. 1-38, Edited by Martí, Rafael and Panos, Pardalos and Resende, Mauricio G. C., 2017. 10.1007/978-3-319-07153-4\_7-1
5. Laurent Michel and Christian Schulte and Pascal Van Hentenryck, Chapter 2: Constraint Programming Tools, *Trends in Constraint Programming*, ISTE 41-57, May 2007
6. P. Van Hentenryck and Laurent Michel, Chapter 17: Growing COMET, *Trends in Constraint Programming*, ISTE 291-297, May 2007
7. T. Fruhwirth, L. Michel, C. Schulte, *Handbook of Constraint Programming*, Chapter 13: Constraints in Procedural and Concurrent Languages, pp. 453-494, Edited by F. Rossi, P. van Beek, T. Walsh, Elsevier, 2006.
8. P. Van Hentenryck and L. Michel. Chapter 9: Constrained Languages for Combinatorial Optimization. *Tutorials on Emerging Methodologies and Applications in Operations Research*. INFORMS 2004, Denver, CO. Edited by H.J. Greenberg, University of Colorado, Denver. Kluwer Academic Publishers Boston/Dordrecht/London.

## Publications (continued)

9. P. Van Hentenryck, L. Michel, F. Paulin and J.F. Puget, *Modeling Languages in Mathematical Optimization*. The OPL Studio Modeling System. Kluwer Academic Publishers, 2003.
10. L. Michel and P. Van Hentenryck. *Optimization Software Class Libraries*, chapter 9. The Modeling Language OPL - A Short Overview, pages 265–294. Advances in the Interfaces of Operations Research and Computer Science. Kluwer Academic Publishers, 2002.
11. P. Van Hentenryck and L. Michel. OPL Script: Composing and Controlling Models *Lecture Notes in Artificial Intelligence (LNAI 1865)*, Springer Verlag 2000.

## JOURNALS

12. Laurent Michel, Pascal Van Hentenryck. A microkernel architecture for constraint programming. *Constraints* 22(2): 107-151, 2017.
13. Laurent Michel, Introduction to the fast track issue for CPAIOR 2015. *Constraints* 20(3): 283-284, 2015.
14. Hang Dinh, Hieu T. Dinh, Laurent Michel, Alexander Russell: The Time Complexity of A\* with Approximate Heuristics on Multiple-Solution Search Spaces. *J. Artif. Intell. Res. (JAIR)* 45: 685-729 (2012).
15. Pierre Schaus, Pascal Van Hentenryck, Jean-Noel Monette, Carleton Coffrin, Laurent Michel, Yves Deville. Solving Steel Mill Slab Problems with constraint-based techniques: CP, LNS, and CBLS, In *Constraints*, volume 16, 2011.
16. Laurent D. Michel, Alexander A. Shvartsman, Elaine L. Sonderegger, Pascal Van Hentenryck. Optimal deployment of eventually-serializable data services, In *Annals OR*, volume 184, 2011.
17. J.A. Pavlich-Mariscal, S.A. Demurjian, L. Michel A Framework for Security Assurance of Access Control Enforcement Code, *Computers & Security*, No. 29, Vol. 7, pp. 770-784, September 2010.
18. Ying Chen, P.B. Luh, Che Guan, Yige Zhao, L.D. Michel, M.A. Coolbeth, P.B. Friedland, S.J. Rourke. Short-Term Load Forecasting: Similar Day-Based Wavelet Neural Networks, In *Power Systems*, *IEEE Transactions on*, volume 25, 2010.
19. Thuong Doan, Steven A. Demurjian, Laurent Michel, Solomon Berhe. Integrating Access Control into UML for Secure Software Modeling and Analysis, In *IJSSE*, volume 1, 2010.
20. Laurent Michel, Andrew See, Pascal Van Hentenryck. Parallel and distributed local search in COMET, In *Comput. Oper. Res.*, Elsevier Science Ltd., volume 36, 2009.
21. G. Doms, L. Michel and P. Van Hentenryck. Model-driven Visualizations of Constraint-Based Local Search, *Constraints*, ISSN 1383-7133 (Print) 1572-9354 (Online), pp. 1-31, Springer, 2009.
22. L. Michel, A. See and P. Van Hentenryck. Transparent Parallelization of Constraint Programming, *INFORMS Journal on Computing* 2009, Vol. 21, pp. 363-382, published online before print May 19, 2009, DOI: 10.1287/ijoc.1080.0313.
23. A.A. Shvartsman, E. Sonderegger and P. Van Hentenryck. Optimal Deployment of Eventually-Serializable Data Services, *Annals of Operations Research*, Vol., No., pp. , February 2010.
24. J. Pavlich-Mariscal, L. Michel and S.A. Demurjian. A Framework of Composable Security Features: Preserving Separation of Security Concerns from Models to Code, *Computer & Security Journal*, special issue on Software Engineering for Secure Systems, Elsevier EES, Vol. 29, No. 3, pp. 350-379, May 2010.
25. T. Doan, S.A. Demurjian, S. Berhe and L. Michel. Integrating Access Control into UML for Secure Software Modeling and Analysis, *International Journal of Secure Software Engineering*, IGI Global, Vol. 1, No. 1, pp. 1-19, January-March 2010.
26. T. Antonyan, S. Davtyan, S. Kentros, A. Kiayias, L. Michel, N. Nicolaou, A.C. Russell and A.A. Shvartsman. State-Wide Elections, Optical Scan Voting Systems, and the Pursuit of Integrity, *IEEE Transactions on Information Forensics and Security*, Vol. 4, No. 4, pp. 597610, 2009.

## Publications (continued)

27. L. Michel and A. See and P. Van Hentenryck, Parallel and Distributed Local Search in Comet, *Computers & Operations Research*, Vol. 36, No. 8, pp. 2357-2375, August 2009, ISSN:0305-0548
28. L. Michel and P. Van Hentenryck. Non-Deterministic Control In Hybrid Search. *Constraints*, 11(4), 353-373, 2006.
29. A. Anagnostopoulos, L. Michel, P. Van Hentenryck, Y. Vergados, A simulated annealing approach to the traveling tournament problem, *Journal of Scheduling*, 9(2), 177-193, Kluwer Academic Publisher, April 2006.
30. L. Michel and P. Van Hentenryck. A Modeling Layer for Constraint Programming Libraries. *INFORMS, Journal on Computing*, 17(4), p. 389-401, Fall 2005.
31. P. Van Hentenryck, L. Michel and L. Liu. Constraint-Based Combinators for Local Search. *Constraints* 10(4), 363-384, 2005.
32. P. Van Hentenryck, and L. Michel, Control Abstractions for Local Search, *Constraints*, 10(2), pp. 137-157, April 2005.
33. Irit Katriel, Laurent Michel, and Pascal Van Hentenryck, Maintaining Longest Paths Incrementally, *Constraints*, 10(2), 159-183, April 2005.
34. L. Michel and P. Van Hentenryck. A Simple Tabu Search for Warehouse Location. *European Journal on Operations Research* 157(3), p. 576-591, 2004.
35. L. Michel and P. Van Hentenryck. A Decomposition-Based Implementation of Search Strategies. *ACM Transactions on Computational Logic*, 5(2), p. 351-383, 2004.
36. L. Michel and P. Van Hentenryck. The Design and Implementation of Localizer. *Constraint*, 5, p.41-82, 2000.
37. L. Michel and P. Van Hentenryck. Localizer: A Modeling Language for Local Search. *INFORMS, Journal on Computing*, 11(1), p. 1-14, 1999.
38. P. Van Hentenryck, L. Michel, and F. Benhamou. Newton: Constraint Programming over Non-linear Constraints. *Science of Computer Programming*, 30(1-2), p. 83-118, 1998.
39. L. Michel and P. Van Hentenryck. Helios: A Modeling Language for Global Optimization and its Implementation in Newton. *Theoretical Computer Science*, 173(1), p. 3-48, 1997.

## CONFERENCES

40. Fanghui Liu, Waldemar Cruz, Laurent Michel: "A Complete Tolerant Algebraic Side-Channel Attack for AES with CP." CP 2018: 259-275.
41. Waldemar Cruz, Fanghui Liu, Laurent Michel: "Securely and Automatically Deploying Microservices in an Hybrid Cloud Infrastructure." CP 2018: 613-628.
42. C. Ma, J. Chandy, L. Michel, F. Liu and W. Cruz: "Influence of Error on Hamming Weights for ASCA." The 13th International Conference on Information Security and Cryptology (INSCRYPT 2017), November 3-5, 2017 (Xi'an, China)
43. Laurent D. Michel, Michel Rueher: What's Hot in Constraint Programming. AAAI 2017: 5073-5075
44. Fanghui Liu, Waldemar Cruz, Chujiao Ma, Greg Johnson, Laurent Michel: A Tolerant Algebraic Side-Channel Attack on AES Using CP. CP 2017: 189-205
45. Heytem Zitoun, Claude Michel, Michel Rueher, Laurent Michel: Search Strategies for Floating Point Constraint Systems. CP 2017: 707-722
46. Wei Yan, Daniel Fontaine, John A. Chandy, Laurent Michel: A design flow with integrated verification of requirements and faults in safety-critical systems. SoSE 2017: 1-6
47. D. Fontaine, L. Michel, P. Van Hentenryck. "Parallel Composition of Scheduling Solvers". CPAIOR16. Banff, BC, Canada, May 2016.
48. Daniel Fontaine, Laurent D. Michel, Pascal Van Hentenryck. "Constraint-Based Lagrangian Relaxation". CP 2014: 324-339.

## Publications (continued)

49. Pascal Van Hentenryck, Laurent D. Michel. “Domain Views for Constraint Programming”. CP 2014: 705-720.
50. Laurent D. Michel, Alexander A. Shvartsman, Nikolaj Volgushev: “A Systematic Approach to Analyzing Voting Terminal Event Logs”. EVT/WOTE 2014.
51. Bing Yan, Peter B. Luh, Biao Sun, Chen Song, Chenhui Dong, Zhongxue Gan, Laurent D. Michel. “Energy-efficient management of eco-communities”. CASE 2013: 106-11.
52. Pascal Van Hentenryck, Laurent Michel. “The Objective-CP Optimization System”. CP 2013: 8-29.
53. Daniel Fontaine, Laurent Michel, Pascal Van Hentenryck. “Model Combinators for Hybrid Optimization.” CP 2013: 299-314.
54. Russell J. Jancewicz, Aggelos Kiayias, Laurent D. Michel, Alexander Russell, Alexander A. Shvartsman. “Malicious takeover of voting systems: arbitrary code execution on optical scan voting terminals”. SAC 2013: 1816-1823.
55. Laurent D. Michel. “Constraint Programming and a Usability Quest”. CP 2012: 1.
56. Laurent D. Michel, Pascal Van Hentenryck. “Constraint Satisfaction over Bit-Vectors”. CP 2012: 527-543.
57. D. Fontaine, L. Michel. “A High Level Language for Solver Independent Model Manipulation and Generation of Hybrid Solvers”, CPAIOR’12 (LNCS), Nantes, France, May 2012. 180-194.
58. L. Michel, P. Van Hentenryck. “Activity-Based Search for Black-Box Constraint Programming Solvers”, CPAIOR’12 (LNCS), Nantes, France, May 2012.
59. Seda Davtyan, Aggelos Kiayias, Laurent Michel, Alexander Russell, Alexander A. Shvartsman. “Integrity of electronic voting systems: fallacious use of cryptography”. SAC 2012: 1486-1493.
60. C. Guan, P. B. Luh, W. Cao, L. D. Michel, K. Cheung. “Dual-tree M-band Wavelet Transform and Composite Very Short-term Load Forecasting”, In IEEE Power and Energy Society, 2011.
61. Samir A. Mohamed Elsayed, Laurent Michel. “Synthesis of Search Algorithms from High-Level CP Models”, In CP, 2011.
62. J.-F. Audy, N. El Hachemi, L. Michel, L.-M. Rousseau L.-M. “Solving a combined routing and scheduling problem in forestry”. In Industrial Engineering and Systems Management (IESM), 2011.
63. Che Guan, P.B. Luh, L.D. Michel, Y. Bar-Shalom, P.B. Friedland. “Interacting multiple model approach for very short-term load forecasting and confidence interval estimation”, In Intelligent Control and Automation (WCICA), 2010 8th World Congress on, volume , 2010.
64. Che Guan, P.B. Luh, L.D. Michel, M.A. Coolbeth, P.B. Friedland. “Hybrid Kalman algorithms for very short-term load forecasting and confidence interval estimation”, In Power and Energy Society General Meeting, 2010 IEEE, volume , 2010.
65. Laurent D. Michel. “Parallelizing constraint programs”, In DAMP, 2010.
66. Laurent Michel, Alexander A. Shvartsman, Elaine L. Sonderegger, Pascal Van Hentenryck. “Load Balancing and Almost Symmetries for RAMBO Quorum Hosting”, In CP, 2010.
67. C. Guan, P. Luh, L. Michel, Y. Bar-Shalom and P. Friedland “Interacting Multiple Model Approach for Very Short-Term Load Forecasting and Confidence Interval Estimation”, Proceedings of the 8th World Congress on Intelligent Control and Automation (WCICA10), pp. , Jinan, China, July 7-9, 2010.
68. Che Guan, Peter B. Luh, L. Michel, Matthew A. Coolbeth, Yige Zhao, Ying Chen, Claude J. Manville, Peter B. Friedland, Stephen J. Rourke. “Very Short-term Load Forecasting: Multilevel Wavelet Neural Networks with Data Pre-filtering”, In Proceedings of the 2009 PESGM conference, 2009.

## Publications (continued)

69. Seda Davtyan, Sotiris Kentros, Aggelos Kiayias, Laurent Michel, Nicolas Nicolaou, Alexander Russell, Andrew See, Narasimha Shashidhar, Alexander A. Shvartsman. “Taking total control of voting systems: firmware manipulations on an optical scan voting terminal”, In Proceedings of the 2009 ACM symposium on Applied Computing, ACM, 2009.
70. Carleton Coffrin, Laurent D. Michel, Alexander A. Shvartsman, Elaine L. Sonderegger, Pascal Van Hentenryck. “Optimizing Network Deployment of Formally-Specified Distributed Systems”, In SEDE, 2009.
71. Laurent Michel, Pascal Van Hentenryck, Elaine Sonderegger, Alexander Shvartsman, Martijn Moraal. Bandwidth-Limited Optimal Deployment of Eventually-Serializable Data Services, Integration of AI and OR Techniques in Constraint Programming for Combinatorial Optimization Problems (Willem-Jan van Hoeve, John Hooker, eds.), Springer Berlin / Heidelberg, volume 5547, 2009.
72. L. Michel, M. Moraal, A.A. Shvartsman, E.L. Sonderegger and P. Van Hentenryck. “Online Selection of Quorum systems for RAMBO Reconfiguration”, (with ), Proceedings of the 15th International Conference on Principles and Practice of Constraint Programming (CP 2009), pp. 88-103, Lisbon, Portugal, September 20-24, 2009.
73. L. Michel, A. Shvartsman, P. Van Hentenryck and E. Sonderegger, “Optimal Deployment of Eventually-Serializable Data Services”, CPAIOR’08, Paris, May 20-23, 2008.
74. P. Van Hentenryck and L. Michel. “The Steel Mill Slab Design Problem Revisited”, CPAIOR’08, Paris, May 20-23, 2008.
75. N. Lynch, L. Michel, A.A. Shvartsman. “Tempo: A Toolkit for The Timed Input/Output Automata Formalism.” *First International Conference on Simulation Tools and Techniques for Communications, Networks and Systems (SIMUTools 2008)*. Industrial Track: Simulation Works. Conference CD, paper 3105, 8 pages, Marseilles, France, March 4-7, 2008.
76. A. Kiayias, L. Michel, A Russell, N. Shashidhar, A. See, A. Shvartsman and S. Davtyan ”Tampering with Special Purpose Trusted Computing Devices: A Case Study in Optical Scan E-Voting”, Annual Computer Security Application Conference, Miami Beach, Florida, December 10-14, 2007.
77. B. Xiong, P. Luh, S-C Chang, L. Michel and A. See Coherent Modeling and Effective Coordination for Building Emergency Evacuation, IEEE CASE 2007, Scottsdale, Arizona, September 22-25, 2007.
78. L. Michel, A . See , P. Van Hentenryck Parallelizing Constraint Programs Transparently, 13<sup>th</sup> *International Conference on Principles and Practice of Constraint Programming. (CP07)*, Providence, RI, September 2007
79. G. Dooms, P. Van Hentenryck, L. Michel Model-Driven Visualizations of Constraint-Based Local Search, 13<sup>th</sup> *International Conference on Principles and Practice of Constraint Programming. (CP07)*, Providence, RI, September 2007.
80. P. Van Hentenryck, L. Michel. Synthesis of Constraint-Based Local Search Algorithms from High-Level Models, AAAI07, Vancouver, British Columbia, July 07.
81. Aggelos Kiayias, Laurent Michel, Alexander Russell, Narasimha Sashidar, Andrew See, and Alexander A. Shvartsman An Authentication and Ballot Layout Attack against an Optical Scan Voting Terminal 2007 USENIX/ACCURATE Electronic Voting Technology Workshop (EVT 07) August 6, 2007, Boston, MA
82. L. Michel and A. See and P. Van Hentenryck. Distributed Constraint-Based Local Search, 12<sup>th</sup> *International Conference on Principles and Practice of Constraint Programming. (CP06)*, Nantes, France, September 2006.
83. L. Michel and A. See and P. Van Hentenryck. High-Level Nondeterministic Abstractions in C++, 12<sup>th</sup> *International Conference on Principles and Practice of Constraint Programming. (CP06)*, Nantes, France, September 2006.



## Publications (continued)

84. P. Van Hentenryck and L. Michel Differentiable Invariants, *12th International Conference on Principles and Practice of Constraint Programming. (CP06)*, Nantes, France, September 2006.
85. A. See, L. Michel, B. Xiong, P. B. Luh, and S.C. Chang. Building Emergency Evacuation Using Transportation and HVAC Systems, *Accepted to IEEE CASE 2006*, Shanghai, China.
86. J. Pavlich-Mariscal, L. Michel, and S. Demurjian, Role Slices and Runtime Permissions: Improving an AOP-based Access Control Schema, *Proc. of 7<sup>th</sup> Intl. Wksp. on Aspect-Oriented Modeling, co-located with MoDELS/UML 2005*, Montego Bay, Jamaica, Oct. 2005.
87. L. Michel and P. Van Hentenryck. Parallel Local Search in Comet. *11<sup>th</sup> International Conference on Principles and Practice of Constraint Programming. (CP05)*, Sitges, Spain, September 2005.
88. P. Van Hentenryck and L. Michel. Non-Deterministic Control for Hybrid Search. *Second International Conference on the Integration of Constraint Programming, Artificial Intelligence and Operations Research (CPAIOR05)*, LNCS, 2005, Prague, Czech Republic.
89. T. Doan, L. Michel, S. Demurjian and T.C. Ting. Stateful Design for Secure Information Systems, *WOSIS*, May 24-25, 2005, Miami, USA.
90. J. Pavlich-Mariscal, L. Michel, and S. Demurjian, Role Slices and Runtime Permissions: Improving an AOP-based Access Control Schema, *Proceedings of 7<sup>th</sup> Intl. Wksp. on Aspect-Oriented Modeling, co-located with MoDELS/UML 2005*, Montego Bay, Jamaica, Oct. 2005.
91. J. A. Pavlich-Mariscal, T. Doan, L. Michel, S. A. Demurjian and T. C. Ting, A Notation for RBAC Permission Assignment and Enforcement, *19<sup>th</sup> Annual IFIP WG 11.3 Working Conference on Data and Applications Security*, August 7-10, 2005, Storrs.
92. P. B. Luh, L. Michel, E. Santos Jr., D. Yu, A. See, B. Xiong, G. Johnson, S.C. Chang, Coherent Configuration and Operation of Building Transportation Systems, *2005 IEEE Conference on Automation Science and Engineering*, August 1-2, 2005, Edmonton, Canada.
93. P. Van Hentenryck and L. Michel. Constrained Based Combinators for Local Search. *10<sup>th</sup> International Conference on Principles and Practice of Constraint Programming. (CP04)*, Toronto, Canada, September 2004. **Distinguished Paper Award.**
94. P. Van Hentenryck and L. Michel. Scheduling Abstractions for Local Search In *Proceedings of the first International Conference on the Integration of Constraint Programming, Artificial Intelligence and Operations Research.*, 2004, Nice, France.
95. L. Michel and P. Van Hentenryck. Iterative Relaxations for Iterative Flattening in Cumulative Scheduling. *In Proceedings of the 14<sup>th</sup> International Conference on Automated Planning & Scheduling (ICAPS-04)* June 2004, Whistler, British Columbia, Canada
96. P. Van Hentenryck and L. Michel. Control Abstractions for Local Search. In *Proceedings of the International Conference on Constraint Programming (CP-2003)* September 2003, Kinsale, Ireland. **Best Paper Award.**
97. L. Michel and P. Van Hentenryck. Maintaining Longest Paths Incrementally. *Proceedings of the International Conference on Constraint Programming (CP-2003)* September 2003, Kinsale, Ireland.
98. L. Michel and P. Van Hentenryck. Comet in Context. *Proceedings of the Principles of Computing and Knowledge Workshop (PCK'50)* June 2003, San Diego, CA.
99. A. Anagnostopoulos, L. Michel, P. Van Hentenryck, and Y. Vergados. A Simulated Annealing Approach to the Traveling Tournament Problem. *Proceedings of CP'AI'OR'03*, Montreal, Canada, May 2003
100. L. Michel and P. Van Hentenryck. A Constrained-Based Architecture for Local Search. In *17<sup>th</sup> Annual ACM Conference on Object-Oriented Programming, Systems, Languages, and Applications*, Seattle, WA, November 2002.
101. L. Michel and P. Van Hentenryck. Modeler++: A Modeling Layer for Constraint Programming Libraries *CP-AI-OR'2001*, Wye College (Imperial College), Ashford, Kent UK
102. P. Van Hentenryck, L. Michel, L. Perron, J.-C. Rgin. Constraint Programming in OPL *Principles and Practice of Declarative Programming*, 1999.

## Publications (continued)

103. P. Van Hentenryck, L. Michel, W. Nuijten, J. Rogerie. Combinatorial Optimization in OPL Studio, *Portugese Conference on Artificial Intelligence*, 1999.
104. P. Van Hentenryck, L. Michel, and F. Benhamou. Newton: Constraint Programming over Non-linear Constraints. *Science of Computer Programming*, 1997
105. L. Michel and P. Van Hentenryck. Localizer: A Modeling Language for Local Search. *3<sup>rd</sup> International Conference on Principles and Practice of Constraint Programming*, 1997.
106. P. Van Hentenryck, O. Degimbe, B. Le Charlier and L. Michel. The impact of Granularity in Abstract Interpretation of Prolog *WSA*, LNCS 724:1-14, 1993
107. B. Le Charlier, O. Degimbe, L. Michel, P. Van Hentenryck. Optimization Techniques for General Purpose Fixpoint Algorithms - Practical Efficiency for the Abstract Interpretation of Prolog. *WSA*, LNCS 724:15-26, 1993

## TUTORIALS

108. Laurent Michel. Mastering the Empirical Maze *CP'11*, Perugia, Italy, September 2011.
109. Laurent Michel. ACP Summer School 2011. *Hybrid Algorithms CP/LS*, Turunc, Turkey, June 2011.
110. Laurent Michel, ACP Summer School 2010. *Modeling and CBLs*, France, June 2010.
111. Laurent Michel and Pascal Van Hentenryck. Constraint-Based Local Search *AAAI*, Vancouver, BC, July 2007
112. Laurent Michel and Pasval Van Hentenryck. Constraint-Based Local Search *CP*, Nantes, France, September 2006
113. Laurent Michel and Pascal Van Hentenryck. Constraint-Based Local Search *AAAI*, Boston, MA, July 2006
114. Laurent Michel and Pascal Van Hentenryck. Constrained Languages for Combinatorial Optimization, *INFORMS*, Denver, CO, October 2004.
115. Laurent Michel. The OPL Optimization Programming Language *ERCIM/CompulogNet Workshop on "Constraint Programming"*, Cyprus, 1999
116. Laurent Michel and Jean-Francois Puget. Interval methods for non-linear constraints. *Constraint Programming '97*

## External Research Grants

- |               |   |
|---------------|---|
| 07/18 — 06/19 | 1. "Voting Technology Research Center," PI: A. Russell, co-PI: L. Michel. State of Connecticut, Secretary of the State \$459,124.   |
| 01/15 — 01/17 | 2. "Securing Linux Software Compartments for embedded Devices". Comcast/CSI. PIs: L. Michel and A. Russell. \$200,000.              |
| 02/15 — 01/18 | 3. "Design Automation and Optimization Framework for Embedded Systems". UTC-IASE. PIs O. Khan, L. Michel, and J. Chandy. \$449,234. |
| 01/12 — 12/12 | 4. "Short-Term Load Forecasting in the Era of Smart Grid Phase II", Alstom Grid, PIs: Peter B. Luh and Laurent D. Michel, \$98,015. |

## External Research Grants (continued)

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|---------------|---|
| 08/11 — 08/13 | 5. “Load Forecasting at the Distribution Level in the Face of Distributed Energy Resource”, Alstom Grid/Department of Energy, PIs: Peter B. Luh and Laurent D. Michel, \$120,000.   |
| 06/11 — 05/13 | 6. “Application for Pre-Election Testing and Post Election Auditing”, submitted with CT Office of the Secretary of the State to the US Election Assistance Commission, PI: A. Shvartsman, co-PIs: A. Kiayias, L. Michael and A. Russell. \$200,000. |
| 06/10 — 05/12 | 7. “GENERAL EDUCATION COURSE ENHANCEMENT GRANT COMPETITION: Introduction to Principles of Programming” with (PI R. McCartney, co-PI: A. Russell, L. Michel). Provost Competition. \$9995.   |
| 11/08 — 12/09 | 8. “Very Short-term Prediction of Electric Power System 30 Minute Operating Reserve” (with PI. P. Luh), ISO New England, Inc. \$142,142.  |
| 01/08 — 12/08 | 9. “Short-Term Load Forecasting: Wavelet-based Similar-Day Neural Networks”, PI: L. Michel, ISO-New England, \$62,217.  |
| 06/07 — 05/10 | 10. “Extending the Power and Applicability of Timed Input/Output Automata Framework” PI: A. Shvartsman, co-PI: L. Michel, MIT Sub-contract. NSF. \$177,713.   |
| 01/07 — 12/12 | 11. “CAREER: Synthesis of Search Procedures for Constraint Programs” PI: L. Michel. NSF - CISE Information and Intelligent Systems – Robust Intelligence, \$525,000.  |
| 05/06 — 06/17 | 12. “Voting Technology Research Center,” PI: A. Shvartsman, co-PIs: L. Michel and A. Russell. State of Connecticut, Secretary of the State \$3,254,730.   |
| 09/04 — 08/07 | 13. NSF-DMI “Achieving Quality and Coherent Configuration and Operations” PI: P. Luh, co-PI: L. Michel, E. Santos. \$335,000.   |
| 08/05 — 08/07 | 14. STTR (DARPA/Veromodo Inc.) “A Framework for Modeling and Analyzing Distributed Systems” PI: L. Michel \$101,113.  |
| 06/03 - 05/04 | 15. “Parallel Local Search Algorithms for Very Large Scale Neighborhood Search”. PI: L. Michel. University of Connecticut. Research Foundation \$20,000.  |

## Teaching

- |                     |   |
|---------------------|---|
| Teaching Award      | <ul style="list-style-type: none"> <li>• I received an “Outstanding Teaching Faculty Award” from the CSE Department in 2004.</li> </ul>   |
| Honor Thesis        | <ul style="list-style-type: none"> <li>• Ashley Dumaine in 2015-2016.</li> </ul>  |
| Independent Studies | <ul style="list-style-type: none"> <li>• Spring 2016 (1), Fall 2015 (2), Spring 2014 (2), Fall 2013 (2), Spring 2013 (2), Fall 2012 (2), Spring 2012 (1), Fall 2011 (2).</li> </ul> |
| Senior Thesis       | <ul style="list-style-type: none"> <li>• Spring 2015 (2)</li> </ul>   |

## Teaching (continued)

### UNIVERSITY OF CONNECTICUT

- CSE3150 • *C++ Essentials*, **Elective, 30-50 students**. Spring 18, Spring 17, Spring 16. [flipped, new course].
- CSE3100 • *System Programming*, **Core CS/CSE, 200 students,taught 2014, 2017**. Fall 14. Co-developed with Prof. I. Mandoiu.
- CSE1729 • *Introduction to Principles of Programming*, **Core CS/CSE, 100 students,taught twice**. Fall 11, Fall 12. Co-developed with Prof. A. Russell.
- CSE244 / CSE4100 • *Programming Language Translation (Compilers)*, **Core CS/CSE, 60-100 students,taught 7x**. Fall 15, Fall 14, Spring 10, Spring 08, Spring 07, Spring 06, Fall 05.
- CSE134 / CSE2100 • *Introduction to Data Structures and Algorithms*, **Core CS/CSE, 60-100 students,taught 7x**. Fall 11, Fall 10, Fall 07, Spring 07, Fall 05, Spring 05, Fall 04.
- CSE233 / CSE4102 • *Programming Languages* **Core CS/CSE, 60-100 students,taught 6x**. Spring 17, Spring 15, Spring 14, Spring 13, Spring 05, Fall 03.
- CSE5102 • *Advanced Programming Languages* **Graduate, 30-40 students,taught once in last 5 years**. Spring 13.
- CSE5707 • *Discrete Optimization* **Graduate, 30-40 students**. Fall 18, Spring 16, Spring 14.

### BROWN UNIVERSITY

- CS4 • *Introduction to Scientific Computing*, Fall 2000. (with N. Pollard).

### UNIVERSITÉ CATHOLIQUE LOUVAIN-LA-NEUVE

- INGI-2592 • *Introduction to Data Structures and Algorithms*, Fall 1999.

## Graduated Students

### PH.D.

- 2008 1. Andrew See.
- 2008 2. Jaimie Pavlich-Mariscal.
- 2015 3. Tamas K. Lengyel.
- 2016 4. Daniel Fontaine.
- current 5. Fanghui Liu, Waldemar Cruz, Benjamin Gentzel, Gregory Johnson.

### MASTERS

- 2005 6. Liyuan Liu.
- 2007 7. Sean Morton.
- 2008 8. Anton Backer.
- 2011 9. Yuting Wang.
- 2012 10. Potluri Ujwal.
- 2013 11. Stephen Corbo.