

Curriculum Vitae

Alexander Feldman

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Date of Birth: September 17, 1977
Address: Delft University of Technology
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Research Interests

Automated reasoning, qualitative reasoning, model-based diagnosis, model-based automated fault isolation and recovery, model-based prognosis, testing and test generation, stochastic local search, satisfiability, constraint optimization techniques, abduction and non-monotonic reasoning, reverse engineering.

Education

9/2005 – current *Ph.D., Computer Science*, in progress (expected 2009/2010)
Delft University of Technology, The Netherlands
Thesis: *Algorithms for Model-Based Reasoning*
Advisor: Prof. Arjan van Gemund

9/2002 – 9/2004 *M.Sc. (cum laude), Computer Science (Technical Informatics)*
Delft University of Technology, The Netherlands
Thesis: *Hierarchical Approach to Fault Diagnosis*
Advisor: Prof. Arjan van Gemund

9/1997 – 6/2000 *B.Sc., Computer Science*
UE Varna, Bulgaria

Employment

5/2008 – 9/2008 Intern
Intelligent Systems Laboratory, Embedded Reasoning Area
Palo Alto Research Center (PARC), Inc.
California, USA

9/2005 – 3/2010 Doctoral Research Fellow
Embedded Software Laboratory, Department of Software Technology
Faculty of Electrical Engineering, Mathematics and Computer Science
Delft University of Technology, The Netherlands

4/2005 – 9/2005 Software Architect
Science and Technology BV, Delft, The Netherlands

9/2001 – 4/2005 Senior Programmer
Market Risk Management, ING Bank, Amsterdam, The Netherlands

7/2000 – 9/2001 Senior Programmer
Zend Technologies Ltd., Ramat Gan, Israel

Project Involvement

GRE	The General Redesign Engine (GRE) uses model-based reasoning techniques and Boolean functional synthesis from component libraries to automate redesign for combinational circuits.
LYDIA	LYDIA stands for Language for sYstem DIAGnosis and it is a modeling language and a reasoning tool-kit biased (e.g., there is support for health modeling) towards model-based fault diagnosis. One of the objectives of LYDIA is to implement novel algorithms which will push the frontiers of model-based diagnosis allowing efficient reasoning over larger systems. Responsible for the framework and modeling language design and implementation and the development of fast algorithms for model-based diagnosis.
FINESSE	The project FINESSE (Fault dIAGnosis for Embedded SyStems dEpendability) aims at the improvement of the accuracy of fault diagnosis when applied to electromechanical systems such as the Paper Handling Systems of Océ Copiers. The challenges in fault diagnosis are to infer maximum diagnostic information on the operational status of software and hardware components from a typically limited amount of (noisy) observations. Responsible for the modeling of the system and the design of algorithms for active testing, recovery and prognosis.
DIF	The Diagnosis Interchange Format (DIF) is an XML-based interchange format for Model-Based Diagnosis (MBD). Its main purposes are to allow sharing of diagnostic models, observation data and fault hypotheses, and to facilitate empirical comparative study of the performance of existing and future MBD implementations. Responsible for the DIF schema design and the construction of MBD benchmark suite.
Lego	Lego is a framework for computing derived data from time-series containing prices of financial instruments. Responsible for the design of the framework and the implementation of Lego modules computing correlation matrices, zero coupon rates, historical and implied volatilities and other statistical derivations.
scl+sssl	The Small Crypto Library and Small Secure Socket Library is a public open-source package for providing secure communication. The libraries include own implementation of many modern symmetric and asymmetric cryptographic algorithms.
Zend Appl. Server	A server for hosting long-living web applications written in PHP on top of the ACE (Adaptive Communication Environment) framework. Responsible for the implementation of the timer API.
Puzzle Generator	A package for generation of crosswords. This is an own design and implementation of a guided backtracking algorithm.

Technical Skills

Proficient

Linux, Solaris, IRIX, HP-UX, Windows
C/C++, Java, Perl, PHP, Flex/Bison, ~~TEX~~
MPI, PVM
Markup languages, SOAP
Sybase, Oracle

Familiar

Python, Tcl/Tk, Prolog, Lisp, Pascal, Fortran
Maple, Matlab

Citizenship

Bulgarian, Israeli, permanently living in The Netherlands

Languages English, Bulgarian, Russian (intermediate), Hebrew (basic), Dutch (intermediate)

Memberships AAAI (student), ACM (student), IEEE (student)

References

Referee 1: Prof. Arjan van Gemund

Address: Delft University of Technology
Mekelweg 4, HB 09.310, 2628 CD, Delft, The Netherlands

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Referee 2: Dr. Johan de Kleer

Address: Palo Alto Research Center (PARC), Inc.
3333 Coyote Hill Road, Palo Alto, CA 94304, USA

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Referee 3: Prof. Gregory Provan

Address: University College Cork
College Road, Cork, Ireland

Tel.: +353 21 420 5892

email: g.provan@cs.ucc.ie

Publications

Conferences

- [1] Alexander Feldman, Gregory Provan, and Arjan van Gemund. Computing multiple minimal diagnoses. In *Proceedings of the First Annual Conference of the Prognostics and Health Management Society (PHM'09)*, San Diego, California, USA, September 2009.
- [2] Alexander Feldman, Gregory Provan, and Arjan van Gemund. Solving strong-fault diagnostic models by model relaxation. In *Proceedings of the Twenty-First International Joint Conference on Artificial Intelligence (IJCAI'09)*, Pasadena, California, USA, July 2009.
- [3] Alexander Feldman, Gregory Provan, and Arjan van Gemund. FRACTAL: Efficient fault isolation using active testing. In *Proceedings of the Twenty-First International Joint Conference on Artificial Intelligence (IJCAI'09)*, Pasadena, California, USA, July 2009.
- [4] Alexander Feldman, Gregory Provan, and Arjan van Gemund. A framework and algorithm for model-based active testing. In *Proceedings of the First International Conference on Prognostics and Health Management (PHM'08)*, Denver, Colorado, USA, October 2008. **Best Student Paper Award.**
- [5] Alexander Feldman, Gregory Provan, and Arjan van Gemund. Computing observation vectors for max-fault min-cardinality diagnoses. In *Proceedings of the Twenty-Third National Conference on Artificial Intelligence (AAAI'08)*, Chicago, Illinois, USA, pages 911–918, July 2008.
- [6] Alexander Feldman, Gregory Provan, and Arjan van Gemund. Computing minimal diagnoses by greedy stochastic search. In *Proceedings of the Twenty-Third National Conference on Artificial Intelligence (AAAI'08)*, Chicago, Illinois, USA, pages 919–924, July 2008.
- [7] Alexander Feldman, Marco Caporicci, Oscar Gracia, and André Bos. Advances in intelligent health reasoning and its application to IBDM. In *Proceedings of the IEEE Aerospace Conference, Big Sky, Montana, USA*, March 2007.

- [8] Alexander Feldman, Jurryt Pietersma, and Arjan van Gemund. All roads lead to fault diagnosis: Model-based reasoning with LYDIA. In *Proceedings of the Eighteenth Belgium-Netherlands Conference on Artificial Intelligence (BNAIC'06)*, Namur, Belgium, October 2006.
- [9] Alexander Feldman and Arjan van Gemund. A two-step hierarchical algorithm for model-based diagnosis. In *Proceedings of the Twenty-First National Conference on Artificial Intelligence (AAAI'06)*, Boston, Massachusetts, USA, July 2006.
- [10] Jurryt Pietersma, Alexander Feldman, and Arjan van Gemund. Modeling and compilation aspects of fault diagnosis complexity. In *Proceedings of IEEE AUTOTESTCON'06*, Anaheim, California, USA, September 2006.

Workshops & Symposia

- [1] Tolga Kurtoglu, Sriram Narasimhan, Scott Poll, David Garcia, Lukas Kuhn, Johan de Kleer, Arjan van Gemund, and Alexander Feldman. First international diagnosis competition - DXC'09. In *Proceedings of the Twentieth International Workshop on Principles of Diagnosis (DX'09)*, Stockholm, Sweden, pages 383–396, June 2009.
- [2] Tolga Kurtoglu, Sriram Narasimhan, Scott Poll, David Garcia, Lukas Kuhn, Johan de Kleer, Arjan van Gemund, and Alexander Feldman. Towards a framework for evaluating and comparing diagnosis algorithms. In *Proceedings of the Twentieth International Workshop on Principles of Diagnosis (DX'09)*, Stockholm, Sweden, pages 373–382, June 2009.
- [3] Alexander Feldman, Gregory Provan, and Arjan van Gemund. The Lydia approach to combinational model-based diagnosis. In *Proceedings of the Twentieth International Workshop on Principles of Diagnosis (DX'09)*, Stockholm, Sweden, pages 403–408, June 2009.
- [4] Alexander Feldman, Gregory Provan, Johan de Kleer, Lukas Kuhn, and Arjan van Gemund. Automated redesign with the General Redesign Engine. In *Proceedings of the Twentieth International Workshop on Principles of Diagnosis (DX'09)*, Stockholm, Sweden, pages 307–314, June 2009.
- [5] Alexander Feldman, Gregory Provan, Johan de Kleer, Lukas Kuhn, and Arjan van Gemund. Automated redesign with the General Redesign Engine. In *Proceedings of the Eighth Symposium on Abstraction, Reformulation, and Approximation (SARA'09)*, Lake Arrowhead, California, US, July 2009.
- [6] Alexander Feldman, Gregory Provan, and Arjan van Gemund. A framework and algorithm for model-based active testing. In *Proceedings of the Nineteenth International Workshop on Principles of Diagnosis (DX'08)*, Blue Mountains, Australia, pages 71–78, September 2008.
- [7] Alexander Feldman, Gregory Provan, and Arjan van Gemund. Approximate model-based diagnosis using greedy stochastic search. In *Proceedings of the Seventh Symposium on Abstraction, Reformulation, and Approximation (SARA'07)*, Whistler, Canada, pages 139–154, July 2007.
- [8] Alexander Feldman, Gregory Provan, and Arjan van Gemund. Approximate model-based diagnosis using greedy stochastic search. In *Proceedings of the Eighteenth International Workshop on Principles of Diagnosis (DX'07)*, Nashville, Tennessee, USA, pages 290–297, May 2007.
- [9] Alexander Feldman, Gregory Provan, and Arjan van Gemund. Generating manifestations of max-fault min-cardinality diagnoses. In *Proceedings of the Eighteenth International Workshop on Principles of Diagnosis (DX'07)*, Nashville, Tennessee, USA, pages 83–90, May 2007.
- [10] Alexander Feldman, Gregory Provan, and Arjan van Gemund. Interchange formats and automated benchmark model generators for model-based diagnostic inference. In *Proceedings of the Eighteenth International Workshop on Principles of Diagnosis (DX'07)*, Nashville, Tennessee, USA, pages 91–98, May 2007.
- [11] Alexander Feldman, Jurryt Pietersma, and Arjan van Gemund. A multi-valued SAT-based algorithm for faster model-based diagnosis. In *Proceedings of the Seventeenth International Workshop on Principles of Diagnosis (DX'06)*, Peñaranda de Duero, Burgos, Spain, June 2006.

- [12] Alexander Feldman, Arjan van Gemund, and André Bos. A hybrid approach to hierarchical fault diagnosis. In *Proceedings of the Sixteenth International Workshop on Principles of Diagnosis (DX'05)*, Monterey, California, USA, pages 101–106, June 2005.

Technical Reports

- [1] Alexander Feldman, Gregory Provan, and Arjan van Gemund. A family of model-based diagnosis algorithms based on Max-SAT. Technical Report ES-2009-02, Delft University of Technology, 2009.
- [2] Alexander Feldman and Arjan van Gemund. Reducing the diagnostic uncertainty of a paper input module by active testing. Technical Report ES-2009-04, Delft University of Technology, 2009.
- [3] Alexander Feldman and Arjan van Gemund. LYDIA user guide. Technical Report ES-2009-05, Delft University of Technology, 2007.
- [4] Alexander Feldman and Arjan van Gemund. Building a LYDIA model of an Océ printer's paper input module. Technical Report TUD-SERG-2007-16, Delft University of Technology, 2007.

Journal Papers in Review

- [1] Alexander Feldman, Gregory Provan, and Arjan van Gemund. Approximate model-based diagnosis using greedy stochastic search. *Journal of Artificial Intelligence Research*, 2010. Submitted for Review.
- [2] Alexander Feldman, Gregory Provan, and Arjan van Gemund. Stochastic algorithms for sequential model-based diagnosis. *Journal of Artificial Intelligence Research*, 2010. Submitted for Review.
- [3] Alexander Feldman, Tolga Kurtoglu, Sriram Narasimhan, Scott Poll, David Garcia, Johan de Kleer, Lukas Kuhn, and Arjan van Gemund. Empirical evaluation of diagnostic algorithms using a generic framework. *International Journal of Prognostics and Health Management*, 2010. Submitted for Review.