Curriculum Vitae — Dr. Jan Arpe

Personal Data

Name	Dr. rer. nat. Jan Arpe
Office	Department of Statistics University of California at Berkeley 367 Evans Hall #3860 Berkeley, CA 94720-3860 United States of America
Phone	+1 510 642 2780
Fax	+1 510 642 7892
Email	arpe *at* stat.berkeley.edu
Web	www.stat.berkeley.edu/∼arpe

Education

since 05/2007 — Postdoctoral fellowship at the Department of Statistics, University of California at Berkeley, USA

Supervisor: Prof. Elchanan Mossel

03/2002 – 04/2007 — PhD studies at the Institute for Theoretical Computer Science, University of Lübeck, Germany

Degree: Dr. rer. nat. (PhD) (12/2006), total grade: *summa cum laude*

Title of doctoral thesis: "Learning Concepts with Few Unknown Relevant Attributes from Noisy Data", refereed by Prof. Dr. Rüdiger Reischuk (advisor, University of Lübeck), Prof. Dr. Hans Ulrich Simon (Ruhr-University Bochum), Prof. Dr. Georg Schnitger (Goethe-University Frankfurt), and Prof. Dr. Thomas Zeugmann (Hokkaido University, Sapporo)

10/1999 – 02/2002 — Study of Mathematics with minor subject Computer Science at the Ludwig-Maximilians-University Munich, Germany

Degree: *Diplom-Mathematiker (diploma in mathematics)*, total grade: *very good*

Title of diploma thesis: "Computation of secondary coefficient groups of the $SO(3) \times S^1$-equivariant mapping degree" (in German)

Focus of studies: theoretical computer science, algebraic topology, functional analysis

10/1996 – 09/1999 — Study of Mathematics with minor subject Computer Science at the Johannes-Gutenberg-University Mainz, Germany

Pre-diploma in Mathematics (minor Computer Science), total grade: *very good*

08/1987 – 06/1996 — Gymnasium Nieder-Olm, Germany (high-school)

Degree: *Abitur* (high-school degree), total grade: *very good*

08/1994 – 08/1995	students' representative for 1200 students
08/1992 – 11/1992	student exchange in Vancouver, Canada

Certificate of the Ministry for Education of Rhineland-Palatinate for exemplary dedication in school

Professional Career

since 05/2007 — DAAD research fellow at the Department of Statistics, University of California at Berkeley, USA

Research project "Discrete Fourier Analysis in Theoretical Computer Science"

03/2002 – 02/2007 — Research associate at the Institute for Theoretical Computer Science, University of Lübeck, Germany

03/2005 – 02/2007	DFG research project Re 672/4 "Robust Inference and Compression"
03/2002 – 02/2005	DFG research project Re 672/3 "Average and Precision Complexity"

Supervised a diploma and a student thesis
Organized several scientific events
Led seminars, presented lectures, instructed student tutors

10/2000 – 02/2001 — Teaching assistant at the Department of Mathematics, Ludwig-Maximilians-University Munich, Germany

Led exercise sessions for course "Linear Algebra for Computer Scientists"

01/2000 – 09/2000 — Working student at Siemens, Munich, Germany

Division "Information and Communication Mobiles"
Tested financial controlling software, conducted a comprehensive application documentation in German and English

10/1998 – 07/1999 — Teaching assistant at the Department of Mathematics, Johannes-Gutenberg-University Mainz, Germany

Led exercise sessions for courses "Foundations of Computer Science I+II"

06/1993 – 08/1999 — Music school teacher (keyboards) at the *Musikschule Enzberg* in Mainz, Germany

Language Skills

German	native language
English	fluent (spoken and written)
French	advanced knowledge
Italian	basic knowledge
Danish	basic knowledge

Memberships

Professional Associations

Deutsche Mathematiker-Vereinigung (DMV) (German National Society for Mathematics)

Gesellschaft für Informatik e.V. (GI) (German Society for Computer Science)

University Boards

Examination Boards for Bachelor and Master Studies, University of Lübeck (until 02/2007)

Other

Tenor saxophone player with UC Jazz (jazz combo), Berkeley

Tenor saxophone player with "Salt Peanuts", bigband of the Lübeck universities and colleges (until 04/2007)

Teaching Experience

All teaching has been done in German unless indicated differently.

University of Lübeck

Complexity Theory	Exercises	winter 2006/07
Methodology of Science	Seminar	winter 2005/06
Computer Science IV (TCS)	Exercises	summer 2003, 2004, and 2005
Algorithmic Game Theory	Seminar	winter 2004/2005
Gems of Theoretical Computer Science	Seminar	summer 2004
Communication Complexity	Seminar	winter 2003/04
Kolmogorov Complexity	Seminar	summer 2003
Boolean Functions (in English)	Seminar	winter 2002/03

Ludwig-Maximilians-University Munich

Linear Algebra for Computer Scientists I	Exercises	winter 2000/01 and 2001/02

Johannes-Gutenberg-University Mainz

Foundations of Computer Science II	Exercises	summer 1999
Foundations of Computer Science I	Exercises	winter 1998/99

Research Interests

Computational Learning

learning with much irrelevant information
learning in the presence of noise

Fourier Analysis of Boolean Functions

applications in learning theory
structural properties

Approximation Algorithms

grammar-based compression, circuit design
communication protocol design

Algebraic Topology

homology and homotopy theory
applications to theoretical computer science

Scientific Publications

Articles in Refereed Journals

1. Jan Arpe and Bodo Manthey. Approximability of Minimum AND-Circuits. *Algorithmica*, to appear.
2. Jan Arpe and Rüdiger Reischuk. Learning Juntas in the Presence of Noise. *Theoret. Comput. Sci., Series A,* 384(1):2-21 (special issue for TAMC 2006), 2007.
3. Jan Arpe, Andreas Jakoby, and Maciej Liśkiewicz. One-Way Communication Complexity of Symmetric Boolean Functions. *Theoret. Informatics Appl.* 39:687-706. EDP Sciences, 2005.

Refereed Conference Papers

1. Jan Arpe and Rüdiger Reischuk. When Does Greedy Learning of Relevant Attributes Succeed?—A Fourier-based Characterization. In Guohui Lin, editor, *Computing and Combinatorics, 13th Annual International Conference, COCOON 2007, Banff, Canada, July 2007, Proceedings*, volume 4598 of *Lecture Notes in Comput. Sci. (LNCS)*, pp. 296–306. Springer, 2007.
2. Jan Arpe and Bodo Manthey. Approximability of Minimum AND-Circuits. In Lars Arge and Rusins Freivalds, editors, *Algorithm Theory—SWAT 2006, 10th Scandinavian Workshop on Algorithm Theory, Riga, Latvia, July 2006, Proceedings*, volume 4059 of *Lecture Notes in Comput. Sci. (LNCS)*, pp. 292–303. Springer, 2006.
3. Jan Arpe and Rüdiger Reischuk. Learning Juntas in the Presence of Noise. In Jin-Yi Cai, S. Barry Cooper, Angsheng Li, editors, *Theory and Applications of Models of Computation, Third International Conference, TAMC 2006, Beijing, China, May 2006, Proceedings*, volume 3959 of *Lecture Notes in Comput. Sci. (LNCS)*, pp. 387–398. Springer, 2006.
4. Jan Arpe and Rüdiger Reischuk. On the Complexity of Grammar-Based Compression. In James A. Storer, Martin Cohn, editors, *Proceedings Data Compression Conference, 28-30 March 2006, Snowbird, Utah*, pp. 173–182. IEEE Press, 2006.
5. Jan Arpe and Rüdiger Reischuk. Robust Inference of Relevant Attributes. In Ricard Gavaldà, Klaus P. Jantke, Eiji Takamoto, editors, *Algorithmic Learning Theory, 14th International Conference, ALT 2003, Sapporo, Japan, October 2003, Proceedings*, volume 2842 of *Lecture Notes in Artificial Intelligence (LNAI)*, pp. 99–113. Springer, 2003.
6. Jan Arpe, Andreas Jakoby, and Maciej Liśkiewicz. One-Way Communication Complexity of Symmetric Boolean Functions. In Andrzej Lingas, Bengt J. Nilsson, editors, *Fundamentals of Computation Theory, 14th International Symposium, FCT 2003, Malmö, Sweden, August 2003, Proceedings*, volume 2751 of *Lecture Notes in Comput. Sci. (LNCS)*, pp. 158-170. Springer, 2003.

Doctoral and Diploma Thesis

1. Jan Arpe. *Learning Concepts with Few Unknown Relevant Attributes from Noisy Data*. Doctoral thesis at the Institute for Theoretical Computer Science, University of Lübeck, August 2006. Advisor: Prof. Dr. Rüdiger Reischuk.

2. Jan Arpe. *Berechnung sekundärer Koeffizientengruppen des $SO(3) \times S^1$-äquivarianten Abbildungsgrades (Computation of secondary coefficient groups of the $SO(3) \times S^1$-equivariant mapping degree).* Diploma thesis at the Mathematical Institute of the Ludwig-Maximilians-University Munich, December 2001. Advisor: Prof. Dr. Heinrich Steinlein.

Further Publications

1. Jan Arpe, Bodo Manthey, and Rüdiger Reischuk, editors, *52. Workshop über Komplexitätstheorie, Datenstrukturen und Effiziente Algorithmen ("Theorietag") (52nd Workshop on Complexity Theory, Data Structures, and Efficient Algorithms ("Theoryday"))*. SIIM Technical Report B-05-04 of the *Schriftenreihe der Institute für Informatik/Mathematik, Serie B*, University of Lübeck, August 16-17, 2005.
2. Bodo Manthey, Jan Arpe, Andreas Jakoby, and Rüdiger Reischuk. Institut für Theoretische Informatik: Theoretische Informatik und das Problem des Handlungsreisenden. (Institute for Theoretical Computer Science: Theoretical Computer Science and the Traveling Salesman Problem) *FOCUS MUL*, 21(3/4):195–198, 2004.

Scientific Talks

1. "Analysis of a Greedy Algorithm for Learning Relevant Variables", Theory Lunch talk, EECS Department, University of California, Berkeley, USA, October 31, 2007.
2. "When Does Greedy Learning of Relevant Attributes Succeed?—A Fourier-based Characterization", 13th Annual International Computing and Combinatorics Conference (COCOON 2007), Banff, Canada, July 17, 2007.
3. "Approximability of Minimum AND-Circuits", 10th Scandinavian Workshop on Algorithm Theory (SWAT 2006), Riga, Latvia, July 8, 2006.
4. "Learning Juntas in the Presence of Noise", Third Annual Conference on Theory and Applications of Models of Computation (TAMC 2006), Beijing, China, May 16, 2006.
5. "On the Complexity of Optimal Grammar-based Compression", IEEE Data Compression Conference (DCC 2006), Snowbird, Utah, USA, March 29, 2006.
6. "Learning Juntas in the Presence of Noise", talk at the CSE Department of the University of California at Santa Cruz, invited by Prof. Manfred Warmuth, March 22, 2006.
7. "On the Complexity of Optimal Grammar-based Compression", 14th Theoryday of section "Automata and Formal Languages" of the German Computer Science Society (GI), Caputh, Germany, September 29, 2004.
8. "Robust Inference of Relevant Attributes", 14th International Conference on Algorithmic Learning Theory (ALT 2003), Sapporo, Japan, October 17, 2003.
9. "One-way Communication Complexity of Symmetric Boolean Functions", 14th International Symposium on Fundamentals of Computation Theory (FCT 2003), Malmö, Sweden, August 14, 2003.
10. "One-Way-Kommunikation symmetrischer Funktionen: Vom Zwei-Spieler- zum Mehr-Spieler-Fall (One-way Communication Complexity of Symmetric Functions: from the two-player case to the multi-player case", 48th Workshop on Complexity Theory, Data Structures, and Efficient Algorithms, Hanover, Germany, June 24, 2003.
11. "Robuste Algorithmen für *Inference of Functional Relations* (Robust Algorithms for *Inference of Functional Relations*)", 46th Workshop on Complexity Theory, Data Structures, and Efficient Algorithms, Marburg, Germany, December 3, 2002.

Reviews for Scientific Conferences

1. 4th Annual Conference on Theory and Applications of Models of Computation (TAMC 2007), Shanghai, China.
2. 17th Annual ACM-SIAM Symposium on Discrete Algorithms (SODA 2006), Miami, Florida, USA.
3. 15th International Symposium on Fundamentals of Computation Theory (FCT 2005), Lübeck, Germany.
4. 15th International Conference on Algorithmic Learning Theory (ALT 2004), Padova, Italy.
5. 21st Annual Symposium on Theoretical Aspects of Computer Science (STACS 2004), Montpellier, France.
6. 17th International Conference on Distributed Computing (DISC 2003), Sorrento, Italy.
7. 14th International Conference on Algorithmic Learning Theory (ALT 2003), Sapporo, Japan.
8. 14th International Symposium on Fundamentals of Computation Theory (FCT 2003), Malmö, Sweden.

References

Prof. Dr. Rüdiger Reischuk

Institut für Theoretische Informatik
Universität zu Lübeck
Ratzeburger Allee 160
23538 Lübeck
Germany

reischuk *at* tcs.uni-luebeck.de

Prof. Elchanan Mossel, PhD

Department of Statistics
University of California at Berkeley
367 Evans Hall #3860
Berkeley, CA 94702-3860
United States of America

mossel *at* stat.berkeley.edu

Prof. Dr. Thomas Zeugmann

Division of Computer Science
Grad. School of Information Science and Technology
Hokkaido University
N-14, W-9
Sapporo 060-0814
Japan

thomas *at* ist.hokudai.ac.jp