

Nora Speer



Background

- 10/1995 - 02/2001: Studies of Biology at [Georg-August-University](#), Göttingen, Germany, degree: Dipl.-Biologist
- 02/1998 - 03/1998: Internship at the [MPI of Immunology](#), Freiburg, Germany
- 08/1998 - 09/1998: Research assistant at the [MPI of Immunology](#), Freiburg, Germany
- 02/1999 - 03/1999: Internship at the [MPI of Biophysical Chemistry](#), Göttingen, Germany
- 03/2000 - 02/2001: Diploma thesis at the [MPI of Biophysical Chemistry](#), Göttingen, Germany
- 03/2000 - 08/2001: Research assistant at the [MPI of Biophysical Chemistry](#), Göttingen, Germany
- 09/2001 - 10/2006: PhD student and research assistant at the Department of Computer Architecture of [Tübingen University](#), Germany

Research Interests

- Machine learning techniques in bioinformatics, in particular clustering
- Knowledge-based analysis of biological data (e.g. microarrays)
- Evolutionary Computation

Teaching

- Seminar: Data Mining in Bioinformatics (WS04/05)
- Exercises for the lecture: Neural Networks (SS04,SS05)
- Seminar: Internet-Multimedia-Standards (SS03)
- Seminar: Neuronal Networks and Evolutionary Algorithms in Bioinformatics (WS02/03)
- Seminar: Bioinformatic-Databases (SS02)

Projects

- BMBF-Project: [NGFN 2](#) (National Genome Research Network): Explorative Project - Inferring Genetic Networks from Gene Expression Data.
- BMBF-Project (**terminated**): [TuebinGENome](#) (Genome Research Network Tuebingen): Functional Genomics of Infectious Disease Susceptibility, Bioinformatic methods for microarray data analysis

Publications

JCell - a Java based framework for inferring regulatory networks from time series data

C. Spieth, J. Supper, F. Streichert, N. Speer, and A. Zell
Bioinformatics, 22, pp. 2051-2052

Ongoing Coxsackievirus Myocarditis Is Associated with Increased Formation and Activity of Myocardial Immunoproteasomes.

G. Szalay, S. Meiners, A. Voigt, J. Lauber, C. Spieth, N. Speer, M. Sauter, U. Kuckelkorn, A. Zell, K. Klingel, K. Stang und R. Kandolf
Journal of Pathology, Vol. 168, No 5, pp. 1542-1552.

Comparing Mathematical Models on the Problem of Network Inference

C. Spieth, N. Hassis, F. Streichert, J. Supper, N. Speer, K. Beyreuther, and A. Zell
Genetic and Evolutionary Computation Conference (GECCO 2006), Seattle, USA, to be published

Comparing Evolutionary Algorithms on the Problem of Network Inference

C. Spieth, R. Worzischek, F. Streichert, J. Supper, N. Speer, and A. Zell
Genetic and Evolutionary Computation Conference (GECCO 2006), Seattle, USA, to be published

Kernel Based Functional Gene Grouping

H. Fröhlich, N. Speer, C. Spieth and A. Zell
Proceedings of the International Joint Conference on Neural Networks (IJCNN 2006),
Vancouver, Canada
pp. 6886-6891, IEEE Press, 2006

Functional Distances for Genes Based on GO Feature Maps and their Application to Clustering

N. Speer, H. Fröhlich, C. Spieth, and A. Zell
Proceedings of the 2005 IEEE Symposium on Computational Intelligence in Bioinformatics
and Computational Biology (CIBCB) 2005, San Diego, USA
pp. 142-149, IEEE Press, 2005, ISBN 0-7803-9387-2

Predicting Single Genes Related to Immune-Relevant Processes

C. Spieth, F. Streichert, N. Speer, C. Sinzger, K. Eberhard, and A. Zell
Proceedings of the 2005 IEEE Symposium on Computational Intelligence in Bioinformatics
and Computational Biology (CIBCB) 2005, San Diego, USA
pp. 461-468, IEEE Press, 2005, ISBN 0-7803-9387-2

Feedback Memetic Algorithms for Modeling Gene Regulatory Networks

C. Spieth, F. Streichert, J. Supper, N. Speer, and A. Zell
Proceedings of the 2005 IEEE Symposium on Computational Intelligence in Bioinformatics
and Computational Biology (CIBCB) 2005, San Diego, USA
pp. 61-67, IEEE Press, 2005, ISBN 0-7803-9387-2

Inferring Regulatory Systems with Noisy Pathway Information

C. Spieth, F. Streichert, N. Speer, and A. Zell
German Conference on Bioinformatics (GCB 2005), Hamburg, Germany
LNI, vol. P-71, pp. 193-203, GI

Spectral Clustering Gene Ontology Terms to Group Genes by Function

N. Speer, C. Spieth, and A. Zell
5th Workshop on Algorithms in Bioinformatics (WABI 2005), Palma, Spain
Lecture Notes in Bioinformatics (LNBI) 3692, pp. 001-012, 2005, Springer

Biological Cluster Validity Indices Based on the Gene Ontology

N. Speer, C. Spieth, and A. Zell
Advances in Intelligent Data Analysis VI: 6th International Symposium on Intelligent Data
Analysis (IDA 2005), Madrid, Spain
Lecture Notes in Computer Science (LNCS) 3646, pp. 429-439, 2005, Springer.

Clustering Based Approach to Identify Solutions for the Inference of Regulatory Networks

C. Spieth, F. Streichert, N. Speer, and A. Zell
Proceedings of the IEEE Congress on Evolutionary Computation (CEC 2005), Edinburgh,
UK
Vol. 1, pp. 660-667, IEEE Press

Identifying Valid Solutions for the Inference of Regulatory Networks

C. Spieth, F. Streichert, N. Speer and A. Zell
Proceedings of the Genetic and Evolutionary Computation Conference (GECCO 2005),
Washington DC, USA
pp. 469-471, ACM Press

Functional Grouping of Genes Using Spectral Clustering and Gene Ontology

N. Speer, H. Fröhlich, C. Spieth, and A. Zell
Proceedings of the IEEE International Joint Conference on Neural Networks (IJCNN 2005),
Montreal, Canada
pp. 298-303, IEEE Press, 2005, ISBN 0-7803-9049-0

Multi-Objective Model Optimization for Inferring Gene Regulatory Networks

C. Spieth, F. Streichert, N. Speer, and A. Zell
Conference on Evolutionary Multi-Criterion Optimization (EMO 2005), Guanajuato, Mexico
LNCS 3410, pp. 607-620, 2005, Springer-Verlag

A Memetic Clustering Algorithm for the Functional Partition of Genes Based on the Gene

Ontology

N. Speer, C. Spieth, and A. Zell
Proceedings of the 2004 IEEE Symposium on Computational Intelligence in Bioinformatics and Computational Biology (CIBCB 2004), San Diego, USA
pp. 252-259, IEEE Press, 2004, ISBN 0-7803-8728-1

A Memetic Co-Clustering Algorithm for Gene Expression Profiles and Biological Annotation

N. Speer, C. Spieth, and A. Zell
Proceedings of the 2004 Congress on Evolutionary Computation (CEC 2004), Portland, USA
Vol. 2, pp. 1631-1638, IEEE Press, 2004, ISBN 0-7803-8515-2

Optimizing Topology and Parameters of Gene Regulatory Network Models from Time-Series Experiments

C. Spieth, F. Streichert, N. Speer, and A. Zell
Proceedings of the Genetic and Evolutionary Computation Conference 2004 (GECCO 2004), Seattle, US
LNCS 3102 (Part I), pp. 461-470, Springer-Verlag, ISBN 3-540-22343-6

A Memetic Inference Method for Gene Regulatory Networks Based on S-Systems

C. Spieth, F. Streichert, N. Speer, and A. Zell
Proceedings of the 2004 Congress on Evolutionary Computation (CEC 2004), Portland, USA
Vol. 1, pp. 152-157, IEEE Press, 2004, ISBN 0-7803-8515-2

Utilizing an Island Model for EA to Preserve Solution Diversity for Inferring Gene Regulatory Networks

C. Spieth, F. Streichert, N. Speer, and A. Zell
Proceedings of the 2004 Congress on Evolutionary Computation (CEC 2004), Portland, USA
Vol. 1, pp. 146-151, IEEE Press, 2004, ISBN 0-7803-8515-2

Iteratively Inferring Gene Regulatory Networks with Virtual Knockout Experiments

C. Spieth, F. Streichert, N. Speer and A. Zell
Proceedings of the 2nd European Workshop on Evolutionary Bioinformatics (evoBIO) Applications of Evolutionary Computing: EvoWorkshops2004, LNCS, vol. 3005, pp. 102-111

Gene Expression patterns of epithelial cells modulated by pathogenicity factors of Yersinia enterocolitica

E. Bohn, S. Müller, J. Lauber, R. Geffers, N. Speer, C. Spieth, J. Krejci, B. Manncke, J. Buer, A. Zell and I.B. Autenrieth
Cellular Microbiology, February 2004, vol. 6, no. 2, pp. 129-141(13), Blackwell Publishing, doi:10.1046/j.1462-5822.2003.00346.x

Differential overexpression of interferon-associated genes during the innate and acute phase of myocardial coxsackievirus B3 infection contributes to chronic myocarditis

G.Szalay, S. Meiners, K. Klingel, J.-J. Schnorr, J. Lauber, C. Spieth, N. Speer, K. Stangl, R. Kandolf,
Immunobiol. vol. 208, p. 181, Elsevier

Cloning and Analysis of a New Neurogene in the Mouse

A.S. Polyakov, N. Speer, O.V. Britanova, S.A. Lukyanov, V.S. Tarabykin, L.I. Korochkin
Russian Journal of Genetics, vol. 40 (6), pp. 694-697, Jun 2004, Springer-Verlag,
doi:10.1023/B:RUGE.0000033320.00563.e6

Clustering Gene Expression Data with Memetic Algorithms based on Minimum Spanning Trees

N. Speer, P. Merz, C. Spieth, and A. Zell
Proceedings of the 2003 Congress on Evolutionary Computation (CEC 2003), Canberra, Australia
Vol. 3, IEEE Press, pp. 1848-1855, 2003, ISBN 0-7803-7804-0

Posters

Upregulation of immunoproteasome gene expression during the acute phase of myocardial

coxsackievirus B3 infection contributes to chronic myocarditis

G. Szalay, S. Meiners, K. Klingel, S. Stefanovic, C. Spieth, N. Speer, K. Stangl, R. Kandolf
IUIS/ICI/FOCIS Congress, 19. - 23. July 2004, Montreal, USA

Genome-wide expression profiling reveals upregulation of host receptors and a strong inflammatory Th1 response in African children with malaria

J.F.J. Kun, A.B.W. Boldt, M.P. Grobusch, C. Tena-Tomás, N. Speer, A. Zell, M. Bonin, P.G. Kremsner
HUGO HGM2003 (Human Genome Meeting 2003), 14. Microarrays and Other New Technologies, Poster 310

Gene Expression of Human Macrophages in Response to Different Microbial Pathogens of Phylogenetically Very Distant Groups

W. Hoffmann, H. Schulz-Key, G. Szalay, A. Kraus, F. Götz, J. Löffler, H. Einsele, N. Speer, C. Spieth, A. Zell, M. Bonin, G. Jahn, C. Sinzger
Functional Genomics of Infectious Diseases and Inflammation, TuebinGENome Symposium, 18. - 20. September 2003, Tübingen

Gene expression profiles in blood cells of malaria patients with different disease conditions

A. Boldt, N. Speer, M. Grobusch, M. Bonin, C. Tena-Tomas, P. Kremsner, A. Zell, J. Kun,
The Genetic and Molecular Basis of Human Disease, NGFN/DHGP Symposium, 17. - 19. November 2002, Berlin

Differential gene expression of epithelial cells upon infection with enteropathogenic Yersinia enterocolitica

S. Müller, E. Bohn, J. Krejci, J. Lauber, J. Buer, C. Spieth, N. Speer, A. Zell, I.B. Autenrieth
The Genetic and Molecular Basis of Human Disease, NGFN/DHGP Symposium, 17. - 19. November 2002, Berlin

Presentations

Differential overexpression of immunoproteasome subunits during the innate and acute phase of myocardial coxsackievirus B3 infection contributes to chronic myocarditis

G. Szalay, S. Meiners, K. Klingel, C. Spieth, N. Speer, K. Stangl, R. Kandolf
Jahrestagung der Gesellschaft für Virologie, 17. - 20. March 2004, Tübingen

Die differentielle Überexpression von Interferon-assoziierten Genen in der frühen und akuten Phase der Enterovirusmyokarditis als Determinante für eine chronische Verlaufsform

G. Szalay, S. Meiners, K. Klingel, J. Lauber, C. Spieth, N. Speer, K. Stangl, R. Kandolf
70. Jahrestagung der Deutschen Gesellschaft für Kardiologie - Herz- und Kreislaufforschung, 17. April 2004, Mannheim

Gene Expression Patterns of Epithelial Cells Modulated by Pathogenicity Factors of Enteric Yersinia

Bohn, E.; Müller, S.; Lauber, J.; Geffers, R.; Speer, N.; Spieth, C.; Krejci, J.; Manncke B.; Buer, J.; Zell, A.; Autenrieth, I.B.,
Functional Genomics of Infectious Diseases and Inflammation, TuebinGENome Symposium, 18. - 20. September 2003, Tübingen

Microfilariae; Microsatellites and Microarrays. Functional Genomics and identification of Microfilaraemia Resistance Loci in a Murine Model of Filariasis

Hoffmann, W.; Schumacher, S.; Schmidt-Oehm, A.; Meyer, B.; Lengeling, A.; Soboslay, P.; Hille, S.; Speer, N.; Spieth, C.; Bonin, M.; Nürnberg, P.; Schulz-Key, H.,
Functional Genomics of Infectious Diseases and Inflammation, TuebinGENome Symposium, 18. - 20. September 2003, Tübingen

Differential Overexpression of Interferon-Associated Genes During the Innate and Acute Phase of Myocardial Coxsackie-Virus B Infection Contributes to Chronic Myocarditis

Szalay, G.; Meiners, S.; Klingel, K.; Schnorr, J.J.; Lauber, J.; Spieth, C.; Speer, N.; Stangl, K.; Kandolf, R.,
Functional Genomics of Infectious Diseases and Inflammation, TuebinGENome Symposium, 18. - 20. September 2003, Tübingen

Press

"Netzwerke unter der Lupe" (German only)

C. Spieth, N. Speer, and A. Zell

[GenomXpress](#) - Informationen der deutschen Genomforschung, pp. 4-6, September 2004

Thesis

Identifizierung und Charakterisierung von Genen mit einem spezifischen Expressionsmuster während der Entwicklung des cerebralen Cortex der Maus

Diploma Thesis (German only), Nora Speer

[Department of Molecular Cell Biology](#), Prof. Dr. Peter Gruss, [MPI of Biophysical Chemistry](#), Göttingen, Germany

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