

NILS GEHLENBORG

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EDUCATION

UNIVERSITY OF CAMBRIDGE & EUROPEAN BIOINFORMATICS INSTITUTE, Cambridge, UK
PhD, October 2006 - October 2010

UNIVERSITY OF TÜBINGEN, Tübingen, Germany
MS in Bioinformatics (“Diplom”), October 2000 - March 2006

UNIVERSITY OF WASHINGTON, Seattle, WA, USA
Visiting Graduate Student, September 2003 - June 2004

RESEARCH & WORK EXPERIENCE

HARVARD MEDICAL SCHOOL, Boston, MA, USA
Research Associate, Center for Biomedical Informatics

BROAD INSTITUTE OF MIT AND HARVARD, Cambridge, MA, USA
Associated Researcher, Cancer Program

since 10/2010 Analysis and visualization of large-scale omics data from The Cancer Genome Atlas (TCGA) project (with Peter J Park, Lynda Chin and Gad Getz).

EUROPEAN BIOINFORMATICS INSTITUTE, Cambridge, UK
PhD Student, Functional Genomics Group

10/2006 - 10/2010 Designed and implemented *Space Maps* visualization method for gene expression data sets with hundreds of samples (with Alvis Brazma).
Worked on information retrieval methods and visual exploration tools for large collections of transcriptomics data sets (with Alvis Brazma and Samuel Kaski).

HELSINKI UNIVERSITY OF TECHNOLOGY, Helsinki, Finland
Visiting PhD Student, Department of Information and Computer Science (now part of Aalto University)

04/2008 - 06/2008 Worked on supervised dimensionality reduction methods for high-dimensional gene expression data sets (with Samuel Kaski).

INSTITUTE FOR SYSTEMS BIOLOGY, Seattle, WA, USA
Intern & Software Developer, Hood & Aebersold Labs

06/2006 - 09/2006 Developed a workflow and a *Prequips* plug-in to support an automated, directed LC-MS/MS approach for peptide identification (with Ruedi Aebersold and Bruno Domon, ETH Zürich).

09/2005 - 05/2006 Developed *Prequips*, an extensible software platform for integration and visualization of proteomics data from mass spectrometry experiments (with Leroy Hood and Daehee Hwang).
Designed and implemented the *Prion Disease Database* in close collaboration with a group of systems biologists (with Leroy Hood, Daehee Hwang and Inyoul Lee).

07/2004 - 09/2004 Worked on an in-house pipeline for automated preprocessing and analysis of microarray data using R/*Bioconductor* (with Daehee Hwang and Inyoul Lee).
Built a web-based tool to create interaction networks from data in the *Human Protein Reference Database* (with Daehee Hwang and Inyoul Lee).

UNIVERSITY OF TÜBINGEN, Tübingen, Germany

Research Assistant, Center for Bioinformatics

- 10/2004 - 08/2005 Designed and implemented an enhanced heatmap visualization method (with Kay Nieselt).
- 09/2002 - 07/2003 Developed the core software and visualization methods for *Mayday* microarray data analysis workbench (with Kay Nieselt).
- 06/2001 - 12/2001 Explored parallelization approaches for simulation of cellular processes (with Markus Schwehm).

UNIVERSITY OF WASHINGTON, Seattle, WA, USA

Independent Researcher, Department of Computer Science and Engineering

- 01/2004 - 06/2004 Researched methods to detect secondary RNA structures in genomic sequences (with Martin Tompa).

AGILENT TECHNOLOGIES INC., Böblingen, Germany

Intern, Patient Monitoring Division R&D (now part of Philips Healthcare)

- 02/2001 - 03/2001 Developed a simulator for measurements from a medical device.
- 07/2000 - 09/2000 Developed a printer driver and queue for an embedded patient monitoring platform.

CITY HOSPITAL, Waiblingen, Germany

Nurse's Aide, Department of Internal Medicine

- 08/1999 - 06/2000 Worked as a nurse's aide on a medical floor in a medium-sized hospital in fulfillment of the compulsory national service.

DEBIS SYSTEMHAUS GmbH, Stuttgart, Germany

Intern/Part-time Employee, Engineering Data Management Group (now part of T-Systems)

- 08/1998 - 03/1999 Developed a web-based documentation system for mainframe software components.

TEACHING EXPERIENCE

UNIVERSITY OF TÜBINGEN, Tübingen, Germany

Teaching Assistant, Department of Cognitive and Information Sciences

- 04/2005 - 07/2005 Graduate-level course "Microarray Bioinformatics" (taught by Kay Nieselt).
- 04/2002 - 07/2002 Undergraduate-level course "Introduction to Computer Science II - Assembler Programming" (taught by Rüdiger Loos).

UNIVERSITY OF WASHINGTON, Seattle, WA, USA

Tutor, Department of Computer Science and Engineering

- 04/2004 - 06/2004 Undergraduate-level course "Concepts and Tools for Software Development" (taught by Craig Chambers).

HONORS & AWARDS

SCHOLAR- AND FELLOWSHIPS

- PhD Fellowship of the European Molecular Biology Laboratory (EMBL), September 2006 - September 2010
- German Academic Exchange Service (DAAD) Scholarship, October 2005 - January 2006
- Karl-Steinbuch-Scholarship, October 2004 - March 2005

TRAVEL GRANTS

Sidney Sussex College Parry-Dutton Travel Award, October 2008

Weill-Cornell ICB NYC Computational Biology Student Meeting Travel Fellowship, July 2008

AWARDS

Best Presentation Award, 5th ISCB Student Council Symposium, July 2009

bwcon Special Prize IT and Life Sciences 2006 for the *Mayday* Workbench, June 2006

Prize for Excellent Work in Ethics in the Natural Sciences, June 1999

OTHER

AAAS/Science Program for Excellence in Science, September 2007 - August 2008

Agilent Technologies Inc. European “Chill-Out” Program, September 2000 - July 2005

PROFESSIONAL ACTIVITIES

LEADERSHIP

Director, International Society for Computational Biology, January 2010 - January 2011

Chair, Student Council of the International Society of Computational Biology, January 2008 - January 2009

CONFERENCE & WORKSHOP ORGANIZATION

General Chair, BioVis: IEEE Symposium on Biological Data Visualization (Providence, RI, USA), October 2011

Co-Organizer, ISMB/ECCB 2011 Data Visualization & User Interfaces Workshop (Vienna, Austria), July 2011

Poster Chair, VIZBI 2011: A Workshop on Visualizing Biological Data (Boston, MA, USA), March 2011

Co-Organizer, VIZBI 2010: EMBO Workshop on Visualizing Biological Data (Heidelberg, Germany), March 2010

Conference Chair, 3rd ISCB Student Council Symposium (Vienna, Austria), July 2007

Conference Chair, 2nd ISCB Student Council Symposium (Fortaleza, Brazil), August 2006

PROGRAM COMMITTEE

Art and Science Exhibition, ISMB 2010 (Boston, MA, USA), July 2010

6th ISCB Student Council Symposium (Boston, MA, USA), July 2010

2nd Eurographics Workshop on Visual Computing in Biology and Medicine (Leipzig, Germany), July 2010

Visual Reflections on Science Exhibition, ISMB/ECCB 2009 (Stockholm, Sweden), July 2009

5th ISCB Student Council Symposium (Stockholm, Sweden), June 2009

SCAMPS PhD Symposium 2009 (Cambridge, UK), April 2009

Visual Reflections on Science Exhibition, ISMB 2008 (Toronto, Canada), July 2008

4th ISCB Student Council Symposium (Toronto, Canada), July 2008

BioSysBio 2007 (Manchester, UK), January 2007

REVIEWING

Eurographics/IEEE Symposium on Visualization (EUROVIS 2011), May 2011

IEEE Information Visualization Conference 2010 (INFOVIS 2010), October 2010

24th British Computer Society HCI Conference, September 2010

8th Asia Pacific Bioinformatics Conference, January 2010

23rd British Computer Society HCI Conference, September 2009

SEMINAR & PANEL ORGANIZATION

Co-Organizer, Panel on “Challenges in Visualizing Biological Data” at VisWeek 2010, October 2010

Co-Organizer, EBI Interfaces Interest Group (Usability, Aesthetics, Visualization), October 2009 - October 2010

Co-Organizer, EBI PhD Student Lunch Seminar Series, March 2009 - December 2009.

Organizer, Visualization Discussion Group at the EBI, December 2007 - September 2009

EDUCATION

Member, Working Group on EMBL PhD Course in Molecular Systems Biology, January 2007 - February 2008

MEMBERSHIP

International Society for Computational Biology (ISCB), since 2004

Institute of Electrical and Electronics Engineers (IEEE), since 2005

American Association for the Advancement of Science (AAAS), since 2007

German Informatics Society (GI e.V.), 2005 - 2010

PUBLICATIONS

PEER-REVIEWED JOURNAL & CONFERENCE PAPERS

1. **N Gehlenborg**, SI O'Donoghue, NS Baliga, A Goesmann, MA Hibbs, H Kitano, O Kohlbacher, H Neuweber, R Schneider, D Tenenbaum and AC Gavin, "Visualization of Omics Data for Systems Biology", *Nature Methods* 7(3):S56-S68 (2010).
2. J Peltonen, H Aidos, **N Gehlenborg**, A Brazma and S Kaski, "An Information Retrieval Perspective on Visualization of Gene Expression Data with Ontological Annotation", *Proceedings of the IEEE 2010 International Conference on Acoustics, Speech, and Signal Processing (ICASSP 2010)*, 2178 - 2181 (2010).
3. **N Gehlenborg***, D Hwang*, IY Lee*, H Yoo, B Petritis, D Baxter, R Pitsstick, B Marzolf, SJ DeArmond, GA Carlson and LE Hood, "The Prion Disease Database: A Comprehensive Transcriptome Resource for Systems Biology Research in Prion Diseases", *Database* 2009:bap011 (2009).
4. J Caldas, **N Gehlenborg**, A Faisal, A Brazma and S Kaski, "Probabilistic retrieval and visualization of biologically relevant microarray experiments", *Bioinformatics* 25(12):i145-i153 (2009).
5. D Hwang*, IY Lee*, H Yoo*, **N Gehlenborg**, J Cho, B Petritis, D Baxter, R Pitsstick, R Young, D Spicer, N Price, JG Hohmann, SJ DeArmond, GA Carlson and LE Hood, "Systems Approach to Prion Disease", *Molecular Systems Biology* 5:252 (2009).
6. **N Gehlenborg**, W Yan, IY Lee, H Yoo, K Nieselt, D Hwang, R Aebersold and L Hood, "Prequips - An Extensible Software Platform for Integration, Visualization and Analysis of LC-MS/MS Proteomics Data", *Bioinformatics* 25(5):682-683 (2009).
7. A Schmidt, **N Gehlenborg**, B Bodenmiller, LN Mueller, D Campbell, M Mueller, R Aebersold and B Domon, "An integrated, directed mass spectrometric approach for in-depth characterization of complex peptide mixtures", *Molecular & Cellular Proteomics* 7:2138-2150 (2008).
8. J Dietzsch*, **N Gehlenborg*** and K Nieselt, "Mayday - A Microarray Data Analysis Workbench", *Bioinformatics* 22(8):1010-1012 (2006).
9. **N Gehlenborg**, J Dietzsch and K Nieselt, "A Framework for Visualization of Microarray Data and Integrated Meta Information", *Information Visualization* 4(3):164-175 (2005).

* equal contribution

COMMENTARIES, EDITORIALS, BOOK CHAPTERS & PUBLISHED ABSTRACTS

1. SI O'Donoghue, AC Gavin, **N Gehlenborg**, DS Goodsell, JK Hériché, CB Nielsen, C North, AJ Olson, JB Procter, DW Shattuck, T Walter and B Wong "Visualizing biological data - now and in the future", *Nature Methods* 7(3):S2-S4 (2010).
2. **N Gehlenborg** and A Brazma, "Visualization of Large Microarray Experiments with Space Maps" (Abstract), *BMC Bioinformatics* 10(Suppl 13):O7 (2009).
3. J Caldas, **N Gehlenborg**, A Faisal, A Brazma and S Kaski, "Probabilistic Retrieval and Visualization of Biologically Relevant Microarray Experiments" (Abstract), *BMC Bioinformatics* 10(Suppl 13):P1 (2009).
4. L Peixoto, **N Gehlenborg** and S Chandra Janga (Eds.), "Highlights from the Fourth International Society for Computational Biology (ISCB) Student Council Symposium at the Sixteenth Annual International Conference on Intelligent Systems for Molecular Biology (ISMB)", *BMC Bioinformatics* 9, Supplement 10 (2008).
5. M Corpas, **N Gehlenborg**, S Chandra Janga and PE Bourne, "Ten Simple Rules for Organizing a Scientific Meeting", *PLoS Computational Biology* 4, e1000080 (2008).
6. **N Gehlenborg**, M Corpas and S Chandra Janga (Eds.), "Highlights from the Third International Society for Computational Biology (ISCB) Student Council Symposium at the Fifteenth Annual International Conference on Intelligent Systems for Molecular Biology (ISMB)", *BMC Bioinformatics* 8, Supplement 8 (2007).
7. **N Gehlenborg**, "Visualisierung für DNA-Chip-Analysen", in D. Spath, K. Haasis and D. Klumpp (Eds.), *Aktuelle Trends in der Softwareforschung* (Vol. 3), 259-270, IRB Fraunhofer Verlag, Stuttgart, Germany (2005). In German.

PRESENTATIONS

INVITED TALKS

1. “Visual Exploration of Large Gene Expression Data Sets with Space Maps”, *University of Leeds - School of Computing*, Leeds, UK (March 2010).
2. “Exploring Biological High-Throughput Data”, *Netherlands Bioinformatics Centre - RSG BioCafé*, Utrecht, The Netherlands (October 2009).

ORAL PRESENTATIONS

1. “Visualization of Large Microarray Experiments with Space Maps”, *5th ISCB Student Council Symposium*, Stockholm, Sweden (June 2009). Best Presentation Award.
2. “Visualization of Large Microarray Experiments with Space Maps”, *SCAMPS PhD Symposium 2009*, Cambridge, UK (April 2009).
3. “Interfaces for Visualization and Exploration of Functional Genomics Data Warehouses”, *VisWeek Doctoral Colloquium*, Columbus, OH, USA (October 2008).

POSTER PRESENTATIONS

1. **N Gehlenborg**, N Kolesnikov and A Brazma, “Ontology-guided Visual Exploration of the ArrayExpress Archive”, *ISMB 2010 & MGED Meeting 13*, Boston, USA (July 2010).
2. **N Gehlenborg**, J Caldas, A Faisal, A Brazma and S Kaski, “Probabilistic Retrieval and Visualization of Biologically Relevant Microarray Experiments”, *Wellcome Trust Functional Genomics and Systems Biology Workshop*, Cambridge, UK (November 2009).
3. **N Gehlenborg** and Alvis Brazma, “Visualization of Large Microarray Experiments with Space Maps”, *12th MGED Meeting*, Phoenix, AZ, USA (September 2009).
4. **N Gehlenborg** and Alvis Brazma, “Visualization of Large Microarray Experiments with Space Maps”, *ISMB/ECCB 2009 & 5th ISCB Student Council Symposium*, Stockholm, Sweden (June 2009).
5. **N Gehlenborg** and Alvis Brazma, “Space Maps: Glyph-based Visualization of Gene Expression Profiles”, *InfoVis 2008*, Columbus, OH, USA (October 2008).
6. **N Gehlenborg** and Alvis Brazma, “Space Maps: Knowledge-supported Visualization of Large High-Throughput Gene Expression Data Sets”, *ISMB 2008 & 4th ISCB Student Council Symposium*, Toronto, Canada (July 2008).
7. IY Lee, D Hwang, H Yoo, D Baxter, **N Gehlenborg**, N Price, B Ogata, R Pistick, D Spicer, R Young, JG Hohmann, SJ DeArmond, GA Carlson, LE Hood, “The Prion Disease Database: An On-line Systems Biology Resource for Hypothesis Building and Testing”, *Prion 2007*, Edinburgh, UK (September 2007).

REFERENCES

Available upon request.

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