

Niels W. Hanson

Personal Information

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Education

*Doctorate of
Philosophy in
Bioinformatics*

2011 – Present University of British Columbia
Thesis: *Linking taxonomic and functional gene networks: towards the next generation of environmental sequence analysis*
Advisor: Dr. Steven J. Hallam
Coursework: Machine Learning, Numerical Methods, Information Visualization, Algorithms for Bioinformatics

*Bachelors of
Computer Science
& Biology*

2005 – 2011 University of British Columbia
GPA: 3.30 · Co-operative Work Study · Statistics Minor
Coursework: Algorithms and Data Structures, Machine Learning, Advanced Relational Databases, Computer Hardware and Operating Systems, Software Engineering, Probability, Statistical Inference, Linear Models, Sample Survey Design, Analysis of Experiments

Publications

BMC Genomics

Metabolic pathways for the whole community. **Niels W. Hanson**, Kishori M. Konwar, Alyse K. Hawley, Tomer Altman, Peter D. Karp, Steven J. Hallam. *July 22, 2014* doi:[10.1186/1471-2164-15-619](https://doi.org/10.1186/1471-2164-15-619)

*IEEE CIBCB 2014
Proceedings*

MetaPathways v2.0: A master-worker model for environmental Pathway/Genome Database construction on grids and clouds. **Niels W. Hanson**, Kishori M. Konwar, Shang-Ju Wu, Steven J. Hallam. *May 21-24, 2014* doi:[10.1109/CIBCB.2014.6845516](https://doi.org/10.1109/CIBCB.2014.6845516)

ISME Journal

Genomic properties of Marine Group A bacteria indicate a role in the marine sulfur cycle. Jody J. Wright, Keith Mewis, **Niels W. Hanson**, Kishori M. Konwar, Kendra R. Maas, Steven J. Hallam. *Sept. 2013* doi:[10.1038/ismej.2013.152](https://doi.org/10.1038/ismej.2013.152)

*Environmental
Science &
Technology*

Metagenomics of Hydrocarbon Resource Environments Indicates Aerobic Taxa and Genes to be Unexpectedly Common. Dongshan An, Sean Michael Caffrey, Jung Soh, Akhil Agrawal, Damon Brown, Karen Budwill, Xiaoli Dong, Peter F. Dunfield, Julia Foght, Lisa M. Gieg, Steven J. Hallam, **Niels W. Hanson**, Zhiguo He, Thomas R. Jack, Jonathan Klassen, Kishori M. Konwar, Eugene Kuatsjah, Carmen Li, Steve Larter, Verlyn Leopatra, Camilla L Nesbø, Thomas B.P. Oldenburg, Antoine P. Page, Esther Ramos-Padron, Fauziah Rochman, Ali

- Saidi-Mehrabad, Christoph W. Sensen, Payal Sipahimalani, Young C. Song, Sandra Wilson, Gregor Wolbring, Ginny Wong, Gerritt Voordouw. *July 2013* doi:[10.1021/es4020184](https://doi.org/10.1021/es4020184)
- Proceedings of the National Academy of Sciences* Prevalent genome streamlining and latitudinal divergence of planktonic bacteria in the surface ocean. Brandon K. Swan, Ben Tupper, Alexander Sczyrba, Federico M. Lauro, Manuel Martinez-Garcia, José M. González, Haiwei Luo, Jody J. Wright, Zachary C. Landry, **Niels W. Hanson**, Brian P. Thompson, Nicole J. Poulton, Patrick Schwientek, Silvia G. Acinas, Stephen J Giovannoni, Mary Ann Moran, Steven J. Hallam, Ricardo Cavicchioli, Tanja Woyke, Ramunas Stepanauskas. *July 2013* doi:[10.1073/pnas.1304246110](https://doi.org/10.1073/pnas.1304246110)
- BMC Bioinformatics* MetaPathways: a modular pipeline for constructing pathway/genome databases from environmental sequence information. Kishori M. Konwar, **Niels W. Hanson**, Antoine P. Pagé, Steven J. Hallam. *June 2013* doi:[10.1186/1471-2105-14-202](https://doi.org/10.1186/1471-2105-14-202)
- BMC Genomics* Expanding the boundaries of local similarity analysis. W. Evan Durno, **Niels W. Hanson**, Kishori M. Konwar, Steven J. Hallam. *Feb. 2013* doi:[10.1186/1471-2164-14-S1-S3](https://doi.org/10.1186/1471-2164-14-S1-S3)
- Proceedings of the National Academy of Sciences* A programmable droplet-based microfluidic device applied to multiparameter analysis of single microbes and microbial communities. Kaston Leung, Hans Zahn, Timothy Leaver, Kishori M. Konwar, **Niels W. Hanson**, Antoine P. Pagé, Chien-Chi Lo, Patrick S. Chain, Steven J. Hallam, Carl L. Hansen. *May 2012* doi:[10.1073/pnas.1106752109](https://doi.org/10.1073/pnas.1106752109)

Work Experience

- Steven J. Hallam Laboratory UBC* *2011 – Present* **Ph.D. Bioinformatics Student**
Research is focused on the development of novel statistical and analytical techniques, and a distributed-computing analytical pipeline, MetaPathways, for the analysis of environmental, metagenomic samples. Integrated genomic and taxonomic information onto the metabolic map of metabolism for pathway-centric analysis. Involved in all areas of lab research and analysis; successfully been published in six-peer reviewed articles to date. Reference: Steven J. Hallam · +1 (604) 827-4216 · shallam@mail.ubc.ca
- UBC Microbiology & Immunology* *May – Sept. 2011* **Software & Database Developer**
Key developer of a web-application and database, RameyDB, for the cataloging of bacterial strains and plasmids at the University of British Columbia. Utilized the LAMP stack, JavaScript, and PHP to create an easy-to-use web interface with intelligent autocomplete to ease data entry. Reference: Patrick Ho · +1 (604) 827-4216 · patrick.ho@ubc.ca
- Evan E. Eichler Laboratory University of Washington* *May – Sept. 2010* **Research Analyst**
Summer research position involved human genome visualization software and back-end database of autistic genomes. Designed and implemented

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and Immunity
Research

UBC Information
Technology

large-scale back-end MySQL database along with Java Swing visualization of genetic variants, predicted via a Hidden Markov Model. Design of efficient layout algorithms allowed for rapid analysis and validation of important genomic alterations, replacing a tedious and disconnected analytical pipeline.

Reference: Evan E. Eichler +1 (206) 685-7336 · eee@gs.washington.edu

Jan – Sept.
2009 Co-op Software Developer

Developed biological database, PaIntDB, for the interactive query and exploration of protein interaction data using Jakarta Struts and JavaScript with a LAMP stack back end. Performed multiple rounds of development and consultation with microbiologist and UBC and SFU stakeholders.

Reference: Geoffrey Windsor +1 (778) 782-2061 · gwinsor@sfu.ca

May – Dec.
2008 Co-op Software Developer

Was key developer of a successful web-based events calendar [UBCEvents](#). Designed, styled, and implemented the Web UI through CSS, HTML, and JavaScript. Developed and modified the underlying open source Bedework XSLT code to parse and translate XML objects retrieved from an Oracle database into structured webpages. Designed statistical scripts using Perl and R to parse logs and summarize calendar use. Promoted calendar through successful campus marketing scheme to ensure user adoption.

Reference: Wilson Lo +1 (604) 244-2699 · wilson.lo@ubc.ca

Conference & Poster Presentations

IEEE
Computational
Intelligence in
Bioinformatics and
Computational
Biology (CIBCB
2014)

Canadian
High-Performance
Computing
Symposium

Asia Pacific
Bioinformatics
Conference (APBC
2013)

International
Symposium on
Microbial Ecology
APBC 2012

MetaPathways v2.0: A master-worker model for environmental Pathway/Genome Database construction on grids and clouds.

Niels W. Hanson, Kishori M. Konwar, Shang-Ju Wu, Steven J. Hallam.

Honolulu, HI, USA. May 22–25 2013.

Hierarchical and High-Performance clustering and annotation for large protein sequence databases. Frances K. Russell, Niels W.

Hanson, Kishori M. Konwar, Steven J. Hallam. Ottawa, ON, Canada. June

2–6 2013.

IMPROV: An integrated MetaPRO-teomics viewer. Niels W.

Hanson, W. Evan Durno, Kishori M. Konwar, Steven J. Hallam. Vancouver, BC, Canada. January 21–23 2013.

Comparative community genomics of the Northeast subarctic

Pacific Ocean. Niels W. Hanson, Jody J. Wright, Kishori M. Konwar,

Steven J. Hallam. Copenhagen, Denmark. August 19–24 2013.

Metabolic Interaction Networks for the Whole Community.

Niels W. Hanson, Antoine P. Pagé, Kishori M. Konwar, Charles G. Howes,

Steven J. Hallam. Melbourne, Australia. January 17–19 2012.

Computer Skills

<i>Basic</i>	Hadoop, MPI, GLPK
<i>Intermediate</i>	C++, HTML, CSS, Perl, PHP, JavaScript, D3, Git, MATLAB, \LaTeX , Linux, OSX, Windows, Adobe Creative Suite
<i>Advanced</i>	Java, Python, R

Other Information

<i>Awards</i>	2012 · UBC Four-year Fellowship (4YF) 2012 · APBC 2012 “Best Poster” Award.
<i>Languages</i>	English · Mothertongue Danish · Basic (simple words and phrases only)
<i>Interests</i>	Piano · Skiing · Running · Triathlon · Badminton

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