

Software Consultant
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TNG Technology Consulting GmbH, Unterföhring, Germany

Software Consultant, since September 2013

Universität Bremen, Bremen, Germany

Lecturer, August 2014

Agile Software Development: A Node.js application in one week

Mathematical Biosciences Institute, Ohio State University, OH

Postdoctoral Fellow, 2011-2014

Mentor: Michael Stillman, Cornell University

EDUCATION

Virginia Tech, Blacksburg, VA

Ph.D. Mathematics, August 2011

Reinhard Laubenbacher (Virginia Bioinformatics Institute), Advisor
Algebraic theory for discrete models in systems biology

M.S. Mathematics, May 2007

Universität Karlsruhe, Karlsruhe, Germany

Vordiplom Mathematik, minor **Computer Science**, May 2006

RESEARCH
GRANTS

Collaborator on [NSF Award #1146819](#) *Collaborative Research: ABI Innovation: PlantSimLab: A Simulation Laboratory for Plant Biology*

PUBLICATIONS

Steady state analysis of Boolean molecular network models via model reduction and computational algebra, A. Veliz-Cuba, B. Aguilar, **F. Hinkelmann**, R. Laubenbacher, BMC Bioinformatics, 2014, DOI: [10.1186/1471-2105-15-221](#)

Downregulation of LRP6 inhibits growth of melanoma cells, **F. Hinkelmann**, B. Delidow, R. Laubenbacher, 2012, under review

Inferring Biologically Relevant Models: Nested Canalizing Functions, **F. Hinkelmann**, A. Jarrah, ISRN Biomathematics, 2012, DOI: [10.5402/2012/613174](#)

ADAM: Analysis of Discrete Models of Biological Systems Using Computer Algebra, **F. Hinkelmann**, M. Brandon, B. Guang, R. McNeill, G. Blekherman, A. Veliz-Cuba, R. Laubenbacher, BMC Bioinformatics, 2011, DOI: [10.1186/1471-2105-12-295](#)

Fast Gröbner Basis Computation for Boolean Polynomials, **F. Hinkelmann**, E. Arnold, 2010, under review

A Mathematical Framework for Agent Based Models of Complex Biological Networks, **F. Hinkelmann**, D. Murrugarra, A. Jarrah, R. Laubenbacher, Bulletin of Mathematical Biology, 2010, DOI: [10.1007/s11538-010-9582-8](https://doi.org/10.1007/s11538-010-9582-8)

Parameter estimation for Boolean models of biological networks, E. Dimitrova, L. García-Puente, **F. Hinkelmann**, A. Jarrah, R. Laubenbacher, B. Stigler, M. Stillman, P. Vera-Licona, Journal of Theoretical Computer Science, April 2010, DOI: [10.1016/j.tcs.2010.04.034](https://doi.org/10.1016/j.tcs.2010.04.034)

Boolean Models of Bistable Biological Systems, **F. Hinkelmann**, R. Laubenbacher, Journal of Discrete and Continuous Dynamical Systems - Series S (DCDS-S) 4-6 December 2011 special issue on Biomathematics, DOI: [10.3934/dcdss.2011.4.1443](https://doi.org/10.3934/dcdss.2011.4.1443)

BOOK
CHAPTERS

Algebraic models and their use in systems biology, R. Laubenbacher, **F. Hinkelmann**, D. Murrugarra, A. Veliz-Cuba, Discrete and Topological Models in Molecular Biology, edited by Natasa Jonoska and Masahico Saito, Springer, ISBN: 9783642401923, 2013

Agent-based models and optimal control in biology: an algebraic approach, **F. Hinkelmann**, M. Oremland, R. Laubenbacher, Mathematical Concepts and Methods in Modern Biology, Edited by Raina Robeva and Terrell Hodge, Elsevier, ISBN: 9780124157804, 2013

Finite Fields in Biology, **F. Hinkelmann**, R. Laubenbacher, Handbook on Finite Fields, edited by Gary Mullen and Daniel Panario, CRC Press, ISBN: 9781439873786, 2013

INVITED
TALKS

The National Alliance for Doctoral Studies in the Mathematical Sciences, Field of Dreams Conference, November 2, 2012, Tempe, AZ

MBI (Mathematical Biosciences Institute), Plenary Talk, Workshop: Algebraic Methods in Evolutionary and Systems Biology, May 2012, Columbus, OH

Colorado State University, Applied Mathematics Seminar, April 4, 2012, Fort Collins, CO

Virginia Tech, Department of Mathematics, Colloquium, *Algebraic theory for discrete models in systems biology*, March 16, 2012, Blacksburg, VA

AWM (Association for Women in Mathematics) Workshop in conjunction with the Joint Mathematics Meeting, January 7, 2012, Boston, MA

SACNAS (Society for Advancing Hispanics/Chicanos and Native Americans in Science), Discrete Systems Biology: Unlocking Nature's Secrets One Step at a Time, October, 2011, San Jose, CA

Georgia Tech, Mathematical Biology Seminar, September 21, 2011, Atlanta, GA

Clemson University, Algebraic Geometry Seminar, *Parameter Estimation for "biologically relevant" polynomial dynamical systems*, March 17, 2011, SC

Duke University, Algebraic Geometry Seminar, *Analysis of Discrete Models of Biological Systems Using Computer Algebra*, January 26, 2011, Durham, NC

North Carolina State University, Symbolic Computation Seminar, *Analysis of Discrete Models*

of Biological Systems Using Computer Algebra, December 1, 2010, Raleigh, NC

Karlsruhe Institute of Technology, Seminar Institut für Wissenschaftliches Rechnen und Mathematischer Modellbildung), *Algebraic Varieties in Systems Biology*, November 5, 2010, Germany

WORKSHOPS
ORGANIZED

MBI (Mathematical Biosciences Institute) Workshop for Young Researchers in Mathematical Biology (WYRMB), organized jointly with R. Leander, September 2012, Columbus, OH

Wake Forest University, School of Medicine Workshop together with R. Laubenbacher, *Mathematical Modeling in Cancer Biology*, March 25th, 2011, Winston-Salem, NC

Math Institutes Modern Math Workshop Mini-course together with R. Laubenbacher, *Mathematics and the Systems Biology of Cancer*, September 29-30, 2010, Anaheim, CA

MENTORING

Team Investigation, May 2013, Columbus, OH

Led a team of five undergraduate students over the course of two weeks, investigating a publication in mathematical biology

Mentor Research Experiences for Undergraduates (REU), *Modeling and Simulation in Systems Biology (MSSB)*, Summer 2012, Blacksburg, VA

Chris Miles, Emily Petty, *Sensitivity Analysis for Polynomial Dynamical Systems*

Mentor at Young Mathematicians Conference, Ohio State University, August 19 - 21, 2011, Columbus, OH

Mentor REU, *MSSB*, Summer 2011, Blacksburg, VA

- Led a group of four undergraduates during a ten week project on *Optimal Control for Polynomial Dynamical Systems* and *Translating complex Agent Based Models into Polynomial Dynamical Systems*
- Played large role in conceptual design of the project
- Student presented at *Young Mathematicians Conference* at Ohio State University, August, 2011, Columbus, OH
- Outstanding Presentation award winner at the 2012 Joint Mathematics Meetings MAA Undergraduate Poster Session, *Heuristic Optimal Control on Polynomial Dynamical Systems Expedited by Use of Algebraic Geometry*

Mentor for Undergraduate Research, *Mathematical Modeling for Biologists, Knockout and Knock-down*, Spring 2011, Blacksburg, VA

Mentor for Undergraduate Research, *Database for Discrete Models of Biological Models*, Fall 2010, Blacksburg, VA

Mentor REU, *Modeling and Simulation in Systems Biology (MSSB)*, Summer 2010, Blacksburg, VA

- Resulted in publication: *ADAM: Analysis of Discrete Models of Biological Systems Using Computer Algebra*, **F. Hinkelmann**, M. Brandon, B. Guang, R. McNeill, G. Blekherman, A. Veliz-Cuba, R. Laubenbacher, BMC Bioinformatics, 2011, DOI: 10.1186/1471-2105-12-295

Mentor for Initiative for Maximizing Student Development (IMSD) Undergraduate Research, *Network Modeling*, Spring and Summer 2009, Blacksburg, VA

Mentor for Undergraduate Research, *Network Modeling*, Fall 2008, Blacksburg, VA

PRESENTATIONS **Plant Immunity: Pathways and Translation**, Keystone Symposium, *PlantSimLab Software Demonstration*, April 9th, 2013, Big Sky, MT

POSTERS

PANELS

Plant Immunity: Pathways and Translation, Keystone Symposium, Poster *PlantSimLab: a simulations laboratory for plant biology*, April 9th, 2013, Big Sky, MT

MBI (Mathematical Biosciences Institute), Postdoctoral seminar, November 8th, 2012, Columbus, OH

Society for Mathematical Biology, Annual Meeting, Session for *Agent-based Models of Biological Systems: Approximation and Control*, *Algebraic Framework for Agent-based models*, July 26th, 2012, Knoxville, TN

Ohio State University, RUMBA Undergraduate Seminar in Mathematical Biology, *Inhibiting tumor growth of melanoma cells*, April 3rd, 2012, Columbus, OH

MBI, Institute Partner Meeting, Poster *Using Systems Biology Approach to Identify Potential Targets for Therapy in Melanoma cells*, February 12th, 2012, Columbus, OH

NIMBioS (National Institute for Mathematical and Biological Synthesis), *Optimal Control on Polynomial Dynamical Systems Expedited by Use of Algebraic Geometry*, Working Group Agent-Based Models of Biological Systems, December 13th, 2011, Knoxville, TN

Ohio Wesleyan University, Science Lecture Series, *Discrete Models in Systems Biology*, November 3rd, 2011, Delaware, OH

Ohio Wesleyan University, Mathematics Colloquium, *Algebraic theory for discrete models in systems biology*, November 3rd, 2011, Delaware, OH

Center for Mathematical Medicine at Nationwide Children's Hospital, Seminar, September 29th, 2011, Columbus, OH

MBI, Postdoctoral Seminar, *Algebraic theory for discrete models in systems biology*, September 8th, 2011, Columbus, OH

Young Mathematicians Conference, Ohio State University, *Panel: Graduate School Orientation Session*, August 21th, 2011, Columbus, OH

Virginia Bioinformatics Institute, PhD defense *Algebraic theory for discrete models in systems biology*, August 1st, 2011, Blacksburg, VA

Virginia Tech Department of Mathematics, Graduate Seminar *Writing a good CV, re-search statement, and teaching statement*, April 7th, 2011, Blacksburg, VA

Virginia Tech Department Graduate Student Assembly, Research Symposium *Algebraic Framework for Discrete Models in Systems Biology*, March 23rd, 2011, Blacksburg, VA

Virginia Tech Department of Mathematics, Visitors' Day *Polynomial Dynamical Systems in Cancer Biology*, March 18th, 2011, Blacksburg, VA

Universität Göttingen, Macaulay2 Workshop *Parameter Estimation for "Biologically Relevant" Polynomial Dynamical Systems*, March 3, 2011, Göttingen, Germany

Virginia Tech Department of Mathematics, Research Days *Mathematics of Systems Biology*, October 29th, 2010

Virginia Tech Student Chapter of SIAM, Student Research Seminars *Algebraic Varieties in Systems Biology*, October 20th, 2010

MBI (Mathematical Biosciences Institute), Workshop for Young Researchers in Mathematical Biology (WYRMB), Poster *ADAM: Analysis of Discrete Models of Biological Systems Using Computer Algebra*, August 30-September 1, 2010, Columbus, OH

SIAM (Society for Industrial and Applied Mathematics) Southeastern-Atlantic Section Conference *Mathematical Framework for Agent Based Models and Optimal Control*, Mathematical Modeling in Life Sciences: Control and Optimization, Part 2, March 2010, Raleigh, NC

AMS (American Mathematical Society) **Joint Mathematics Meeting** Panel Discussion *Finding a Research Topic and Thesis Advisor*, MAA Committee on Graduate Students and the Young Mathematicians' Network, January, 2010, San Francisco, CA

SAMSI (Statistical and Applied Mathematical Sciences Institute) Working Group *Random Delay Networks*, February 4, 2009

AMS Joint Mathematics Meeting *A General Method to derive a Boolean Model from a Continuous Model for Gene Regulatory Networks*, January 6, 2009, Washington DC

Virginia Tech Physics Department, Graduate Student Seminar *Gene Regulation in the Lac Operon*, September 12, 2008

Virginia Tech Student Chapter of SIAM, Student Research Seminars *General Method to Transition from a Continuous Model to a Discrete Network*, September 3, 2008

SIAM Annual Meeting *Understanding Dynamics of Gene Regulation Using a Discrete Model*, July 7-11, 2008

HONORS

AWM Travel Award AWM Workshop in conjunction with the Joint Mathematics Meeting, January 4-7, 2012, Boston, MA

MBI Postdoctoral Fellow 2011-2014

Steenekamp Fellowship 2010-2011

AMS Travel Award Joint Mathematics Meeting, January 13-16, 2010, San Francisco, California

SACNAS Travel Scholarship (Advancing Hispanics/Chicanos and Native Americans in Science), Improving the Human Condition: Challenges for Interdisciplinary Science, October 15-18, 2009, Dallas, Texas

SIAM Travel Award SIAM Annual Meeting, July 6-10, 2009, Denver, Colorado

SIAM Student Chapter Certificate of Recognition 2009, faculty advisor Lizette Zietsman

SIAM Student Travel Award SIAM Annual Meeting, July 7-11, 2008, San Diego, California

Hatcher Fellowship Summer 2008

Baden-Württemberg Stipendium Scholarship 2006-2007

SELECTED
WORKSHOPS

Macaulay2 Workshop, January 6 - 10, 2014, Berkeley, California

Working Group **Agent-Based Models of Biological Systems: Pathways to control and optimization**, NIMBioS (National Institute for Mathematical and Biological Synthesis), November 27-29, 2012, Knoxville, TN

MBI BioSciences Problem-Solving Workshop, **Mathematical model of blood calcium ion regulation**, July 16-20, 2012, Columbus, OH

Working Group **Agent-Based Models of Biological Systems: Pathways to control and optimization**, NIMBioS (National Institute for Mathematical and Biological Synthesis), December 13-15, 2011, Knoxville, TN

Macaulay2 Workshop, Institute for Mathematics and Its Applications, July 25-29, 2011, Minneapolis, MN

Macaulay2 Workshop, Courant Center for Higher Order Structures, February 28 - March 5, 2011, Göttingen, Germany

AIM (American Institute of Mathematics) **Parameter identification in graphical models**, October 4-8, 2010, Paolo Alto, California

MBI Bootcamp in Cancer Modeling, September 7-10, 2010, Columbus, Ohio

Macaulay2 Workshop, August 7-13, 2010, Colorado Springs, Colorado

Macaulay2 Workshop, January 7 - 13, 2010, Berkeley, California

MSRI Graduate Workshop Toric Varieties, June 15-26, 2009, Berkeley, California

ASSOCIATION
MEMBERSHIPS

SIAM Student Chapter at Virginia Tech

President, 2008 - 2009

Organized Student Research Seminar, visiting speakers program, field trip to Joint Mathematics Conference, Minisymposia, website maintenance

TEACHING
EXPERIENCE

Virginia Tech

Course Instructor - Integral Calculus, Summer 2009

- Lectured five times a week for a class of 32 undergraduate students
- Created syllabus
- Wrote and graded course exams
- Assigned grades to students

Course Instructor - Computer-tested Integral Calculus, Spring 2009

Course Instructor - Differential Calculus, Fall 2007 - Fall 2008

Instructional Assistant, Fall 2006

- Assisted students with math concepts and software questions

Universität Karlsruhe

Numerical Analysis Programming Lab Instructor, Spring 2006

- Instructed students once a week and graded C++ and Java exercises

Linear Algebra and Real Analysis Recitations, Spring 2005 - Spring 2006

- Lectured once a week for a class of 70 undergraduate students
- Graded homework and exams

OTHER WORK
EXPERIENCE

EnBW Trading GmbH, Karlsruhe, Germany, Summer 2007

Internship Methods and Models at EnBW Trading GmbH

- Research on energy consumption and production in Europe.

United Internet AG, Karlsruhe, Germany, 2001 - 2006

Unix System Developer

- Responsible for planning, programming and testing of software, mainly written in C, C++
- Projects included Voice over IP server software and low level storage software.

LANGUAGES

Fluent: German (Native), English, Italian
Basic: French, Spanish

REFERENCES

Reinhard Laubenbacher, reinhard@vbi.vt.edu, Virginia Tech, Virginia Bioinformatics Institute, PhD advisor

Mike Stillman, mike@math.cornell.edu, Cornell University, Department of Mathematics