ERIC D. MJOLSNESS

emj@uci.edu

EDUCATION

- Ph.D., Physics and Computer Science. June 1986. California Institute of Technology. Thesis title: Neural Networks, Pattern Recognition, and Fingerprint Hallucination. (Completed September 1985.) Thesis advisor: John J. Hopfield.

- A.B., Physics and Mathematics. May 1980. Washington University in St. Louis. Graduated magna cum laude.

EMPLOYMENT

- Professor, Department of Computer Science, Donald Bren School of Information and Computer Sciences, University of California, Irvine. July 2009-present.

- Professor (additional appointment), Department of Mathematics, University of California, Irvine, July 2009 – present. Associate Professor October 2005-June 2009.

- Associate Professor, Department of Computer Science, Donald Bren School of Information and Computer Sciences, University of California, Irvine. July 2002-June 2009.

- Group Supervisor, Principal, Jet Propulsion Laboratory, California Institute of Technology. April 2000 - Spring 2002.

- Computer Scientist - Principal, Jet Propulsion Laboratory, California Institute of Technology. September 1998 - April 2000; Spring 2002 - 2008.

- Computer Scientist - Senior, Jet Propulsion Laboratory, California Institute of Technology. June 1997 - August 1998.

- Research Scientist, Department of Computer Science and Engineering, University of California, San Diego. January 1995 to May 1998.

- Associate Professor. July 1990 to December 1994. Department of Computer Science, Yale University, New Haven.
- Assistant Professor. September 1985 to June 1990. Yale University, New Haven.
- Graduate Research Assistant. August 1980 to June 1985. California Institute of Technology, Pasadena.
- Teaching Assistant. October 1981 to May 1985. California Institute of Technology, Pasadena.

HONORS

- Leverhulme Visiting Professor, Sainsbury Laboratory, University of Cambridge, January-July 2015.
- Fellow of the American Association for the Advancement of Science (AAAS), November 2014.
- Pauli Center for Theoretical Studies (invited visitor), at ETH Zürich and the University of Zürich, September 2012.
- Ulam Fellow, Center for Nonlinear Studies (CNLS), Los Alamos National Laboratory, July 2012.
- Moore Distinguished Scholar, California Institute of Technology, 2010-2011.
- Senior Member of Sigma Xi, May 1999.
- NASA Summer Faculty Fellowship in Aeronautics and Space Research, at the Jet Propulsion Laboratory, 1996.
- Senior Faculty Fellowship, Yale University, 1991-92.
- Phi Beta Kappa, 1980.
- Arthur Holly Compton Fellowship, Washington University in St. Louis, 1976-1980.

EXPERIENCE

- External Advisory Committee, Center for Non-LinearSystems (CNLS), Los Alamos National Laboratory, 2019-present.
- Visiting Associate in Biology, California Institute of Technology. July 2002 – September 2010; September 2015 - present.
- Principal Investigator, $5M NSF-funded "Computable Plant" project, www.computableplant.org, 2003-2009.
- Faculty/Part Time, Machine Learning and Instrument Autonomy Group, NASA Jet Propulsion Laboratory. July 2005 – 2009.

- Faculty Associate in Biology, California Institute of Technology. February 2000 - July 2002.

- Faculty member of the Institute for Neural Computation, University of California, San Diego, October 1994 to May 1998.

- Visiting Scholar, September to December 1994, Department of Computer Science and Engineering, University of California, San Diego.

- Project Director for Artificial Neural Networks, at the Yale Center for Theoretical and Applied Neuroscience, August 1991 to December 1994.

- Co-Director (with Gunter Wagner), Center for Computational Ecology of the Yale Institute for Biospheric Studies, August 1992-December 1994.

- Faculty member of the Yale Program in Neuroscience, July 1990 to December 1994.

- Collaborator, Los Alamos National Laboratory. July, 1983 to 1993.

- Consultant to the Federal Bureau of Investigation on automated fingerprint identification, summer 1991 and summer 1992.

- Visiting Scientist, Institute for Theoretical Physics, Santa Barbara. November - December 1986.

Ph.d. Thesis Supervision

- David Orendorff, "Exact and Hierarchical Reaction Leaping: Asymptotic Improvements to the Stochastic Simulation Algorithm". PhD thesis, UC Irvine, June 2012.

- Behnam Compani-Tabrizi, "Schematic Representation and Database Population Strategies for Sigmoid, a Biochemical Network Modeling System". PhD thesis, UC Irvine, May 2012.

- Gary Todd Johnson, "Dependency Diagrams and Graph-Constrained Correlation Dynamics: New Systems for Probabilistic Graphical Modeling", UC Irvine, March 2012.

- Guy Yosiphon, "Stochastic Parameterized Grammars: Formalization, Inference, and Modeling Applications", UC Irvine, June 2009.

- Li Zhang, "Dynamic Biological Signal Pathway Modeling and Parameter Estimation through Optimization", UC Irvine, June 2008.

- Tarek Najdi, "Biological Analysis and Mathematical Modeling of Glucose Metabolism and the Aspartate and Pyruvate Family Amino Acid Biosyntheses in *Escherichia coli* K12", jointly supervised with Wesley Hatfield, UC Irvine, March 2008.

- Christopher Hart, "Inferring Genetic Regulatory Network Structure: Integrative Analysis of Genome-Scale Data", jointly supervised with Barbara Wold, California Institute of Technology, March 2005.

- Dimitris Tsioutsias, "Multiscale Attention as a Globally Convergent Framework for Large-Scale Nonlinear Optimization", Yale University, May 1997.

- Georgios Marnellos, "Gene Network Models Applied to Development and Evolution", Yale University, May 1997.

- Steven Gold, "Matching and Learning Structural and Spatial Representations with Neural Networks", May 1996, Yale University.

- Chien-Ping Lu: "Online Pose Estimation and Model Matching", Yale University, May 1996.

Service

- External Advisory Committee, Center for Non-Linear Systems (CNLS), Los Alamos National Laboratory, May 2019.

- Editorial Board member, Machine Learning: Science and Technology. Published by the UK Institute Of Physics. March 2019 - present.

- Organizing Committee, Second Workshop on Physics-Informed Machine Learning. Santa Fe, NM January 21-25 2018.

- Co-Organizer with Przemyslaw Prusinkiewicz of the workshop "Mathematics for Developmental Biology" (17w5164), Banff International Research Station (BIRS), Banff Alberta Canada December 2017.

- Member, Academic Council Special Committee on Lab Issues (ACSCOLI) for a three-year term, beginning September 1, 2017. "ACSCOLI's primary charge is to provide regular and broadly-based Senate oversight of UC's relationship with the National Labs (Los Alamos National Laboratory, Lawrence Berkeley National Lab, and Lawrence Livermore National Laboratory)." - UC Academic Senate ACSCOLI web site.

- Reviewer, Association for the Advancement of Artificial Intelligence (AAAI) Conference on Artificial Intelligence AAAI-2018.

- Program Committee and Session Chair (ML-1 Optimization), AAAI-17. The Thirty-First National Conference on Artificial Intelligence.

- Steering Committee member, representing the Computing Division of the Computer Science Department, for the new professional Master of Computer Science graduate degree program, UC Irvine, December 2016 - present.

- Executive Committee member, Mathematical and Computational Systems Biology (MCSB) graduate program, UC Irvine, November 2015 - present.

- Advisory Committee Member, Center for Advanced Methods in Biological Image Analysis of the Beckman Institute, California Institute of Technology, 2015-present.

- Director, Center for Computational Morphodynamics, Bren School of Information and Computer Sciences, July 2009-present.

- Organizing committee member, UCI proposal for a joint degree program with SDSU (San Diego State University) in Computational Science, 2013-2015. Admissions Committee, 2018.

- Program Committee, Bioinformatics of Genome Regulation and Structure\Systems Biology (BGRS\SB) 2012, Novosibirsk Russia. Also BGRS 2006 and BGRS 2004, Novosibirsk Russia.

- Member, International Arabidopsis Informatics Consortium, 2010-2012.

- Co-organizer with Przemyslaw Prusinkiewicz of the symposium "Mathematics and Biomechanics of Plant Development", at the International Botanical Congress (IBC) 2011, Melbourne, July 2011.

- Member, Gatsby Cambridge Computational Advisory Group, Sainsbury Laboratory, Cambridge UK, 2010-2012.

- Coordinator (with E. Meyerowitz and C. Yu), short program "Morphodynamics of Plants, Animals and Beyond", Kavli Institute for Theoretical Physics, August-September 2009. http://online.itp.ucsb.edu/online/morphodyn_m09/ .

- Action Editor, then Deputy Editor for Molecular and Biophysical Systems, Neural Computation, January 1995 to present.

- Project leader, Systems Biology, Institute for Genomics and Bioinformatics, University of California, Irvine, October 2003 – present.

- Member, subcommittee on Systems Biology, US Department of Energy (DOE) Biological and Environmental Research Advisory Committee (BERAC), August 2009-2010. Also review panel member, DOE BRC (Bioenergy Research Centers) open re-competition, December 2016 and (2nd level) February 2017. Result of the full DOE review process: ~$200M funding for four BRCs.

- Review panel member, Caltech/NASA Jet Propulsion Laboratory: Mission (Information Technology / Computing and Autonomy Systems) Research Program Year End Review, 2005-2011.

- International Advisory Board, Center for Plant Integrative Biology (CPIB), University of Nottingham. 2007-2012.

- Lead organizer, Grand Challenge preproject team "Computational Morphodynamics of Plants", iPlant Collaborative, Spring 2008-2009.

- Program Committee, European Conference on Computational Biology (ECCB) 2008.

- International Conference on Systems Biology (ICSB) 2007 Scientific Review Committee.

- Advisory Board Member and Co-founder, Caltech Biological Network Modeling Center (BNMC), 2005 to 2009.

- Co-organized (with Przemyslaw Prusinkiewicz) symposium "Modeling plant development: From genes to phenotypes", at the International Botanical Congress, Vienna 2005.

- University of California, Irvine representative for the executive committee of the UC Information Technology for Life Sciences program, May 2005- December 2008.

- Associate Editor, IEEE Transactions on Neural Networks, January-December 1998, June 1991 to December 1992.

- Board Member, Neural Information Processing Systems Foundation, April 1995 to 2000. Treasurer 1995- 1998.

- Program committee, KDD-97 Knowledge Discovery and Datamining, Newport Beach CA 1997.

- Program committee, AAAI-96 The Thirteenth National Conference on Artificial Intelligence. Also on program committee, International Conference on Neural Information Processing (ICONIP'96), Hong Kong, 1996.

- Board of Advisors, Neural Computing Surveys, 1996 to 1998.

- Co-organized, with Gunter Wagner, the Center for Computational Ecology of the Yale Institute for Biospheric Studies. Fall 1991-December 1994.

- Member of the Executive Committee of the Yale Program in Neuroscience, July 1990 to June 1993.

- Contributed to the founding proposal and establishment of Yale's Center for Theoretical and Applied Neuroscience (subsequently Neuroengineering and Neuroscience Center). Summer 1990.

- Organized a workshop at the Neural Information Processing Systems conference, in 1993 and 1995.

- Recent referee reports for Science, Bioinformatics, IET Systems Biology, BMC Systems Biology, Journal of Bioinformatics and Computational Biology, Neural Computation, IEEE Transactions on Neural Networks, Neural Networks, Journal of the Optical Society of America, SIAM Journal on Scientific and Statistical Computing, Journal of the Association for Computing Machinery, Biological Cybernetics, NSERC, ECCB, ICSB, GECCO, SIGGRAPH, the International Parallel Processing Symposium, Cambridge University Press, Kluwer Academic Publishers, American Association for Artificial Intelligence, Royal Society, Annals of Applied Statistics.

AFFILIATIONS

- American Association for the Advancement of Science
- Association for Computing Machinery
- American Mathematical Society
- American Physical Society
- Society for Industrial and Applied Mathematics

JOURNAL PUBLICATIONS

J64 **"**Learning Moment Closure Approximations in Reaction-Diffusion Systems with Spatial Dynamic Boltzmann Distributions", Oliver K. Ernst, Tom Bartol, Terrence Sejnowski, Eric Mjolsness. Physical Review E, v.99, 063315, 26 June 2019.
DOI: 10.1103/PhysRevE.99.063315 **.**

J63 "Prospects for Declarative Mathematical Modeling of Complex Biological Systems", Eric Mjolsness. Bulletin of Mathematical Biology, first online 7 June 2019. https://doi.org/10.1007/s11538-019-00628-7. Also preprint http://arxiv.org/abs/1804.11044 in a different format.

J62 "Multilevel Artificial Neural Network Training for Spatially Correlated Learning", Cory Scott and Eric Mjolsness. SIAM Journal on Scientific Computing, accepted 22 April 2019.

J61 "Are microtubules tension sensors?" Olivier Hamant, Daisuke Inoue, David Bouchez, Jacques Dumais, and Eric Mjolsness. Nature Communications, v10 article no. 2360, 29 May 2019.

J60 "Learning Dynamic Boltzmann Distributions as Reduced Models of Spatial Chemical Kinetics", Oliver K. Ernst, Tom Bartol, Terrence Sejnowski, and Eric Mjolsness. Journal of Chemical Physics 149, 034107, July 2018. Also arXiv 1803.01063, March 2018.

J59 "Pycellerator: An arrow-based reaction-like modelling language for biological simulations", Bruce E. Shapiro and Eric Mjolsness. Bioinformatics, Oct 26. 2015.
DOI: 10.1093/bioinformatics/btv596.

J58 "Model Reduction for Stochastic CaMKII Reaction Kinetics in Synapses by Graph-Constrained Correlation Dynamics", Todd Johnson, Thomas Bartol, Terrence Sejnowski, and Eric Mjolsness. Physical Biology 12:4, July 2015.

J57 "Analysis of Cell Divisions Patterns in the Arabidopsis Shoot Apical Meristem", Bruce E. Shapiro, Cory Tobin, Eric Mjolsness, and Elliot M. Meyerowitz. Proceedings of the National Academy of Sciences 112:15 pp 4815–4820, 2015.

J56 "Using Cellzilla for Plant Growth Simulations at the Cellular Level", Bruce E. Shapiro, Elliot Meyerowitz, Eric Mjolsness. Frontiers in Plant Biophysics and Modeling, 4:00408, 2013.

J55 "Model of Structuring the Stem Cell Niche in Shoot Apical Meristem of *Arabidopsis thaliana*", S.V. Nikolaev, U.S. Zubairova, A.V. Penenko, E.D. Mjolsness, B.E. Shapiro, N.A. Kolchanov., Doklady Akademii Nauk, 2013, Vol. 452, No. 3, pp. 336–338, September 2013. Original in Russian. English version is Doklady Biological Sciences, 2013, Vol. 452, pp. 316–319. (Pleiades Publishing)

J54 "Time-ordered product expansions for computational stochastic systems biology", Eric Mjolsness. Physical Biology, v 10, 035009, June 2013.

J53 "Mathematics of Small Stochastic Reaction Networks: A Boundary Layer Theory for Eigenstate Analysis", Eric Mjolsness and Upendra Prasad. Journal of Chemical Physics 138, 104111 (DOI: 10.1063/1.4794128), March 2013.

J52 "A Hierarchical Exact Accelerated Stochastic Simulation Algorithm", David Orendorff and Eric Mjolsness. Journal of Chemical Physics 137, 214104 (DOI: 10.1063/1.4766353 ; arXiv:1212.4080), December 2012.

J51 "Combined *in silico/in vivo* analysis of mechanisms providing for root apical meristem self-organization and maintenance." Mironova VV, Omelyanchuk NA, Novoselova ES, Doroshkov AV, Kazantsev FV, Kochetov AV, Kolchanov NA, Mjolsness E., Likhoshvai VA. Annals of Botany 110:2 pp 349-360 (DOI: 10.1093/aob/mcs069), July 2012.

J50 "Measuring single-cell gene expression dynamics in bacteria using fluorescence time-lapse microscopy", Jonathan Young, James Locke, Alphan Altinok, Nitzan Rosenfeld, Tigran Bacarian, Peter Swain, Eric Mjolsness, and Michael Elowitz. Nature Protocols 7:1, pp. 80-88, 2012; published online December 15, 2011.

J49 "Towards Measurable Types for Dynamical Process Modeling Languages", Eric Mjolsness. Electronic Notes in Theoretical Computer Science (ENTCS), vol. 265, pp. 123-144, 6 Sept. 2010, Elsevier. Also Proceedings of the 26th Conference on

Mathematical Foundations of Programming Semantics (MFPS 2010). DOI 10.1016/j.entcs.2010.08.008. (*Same as C73*.)

J48 "Parameter inference for discretely observed stochastic kinetic models using stochastic gradient descent", Yuanfeng Wang, Scott Christley, Eric Mjolsness, and Xiaohui Xie. BMC Systems Biology 4:99, 2010.

J47 "A plausible mechanism for auxin patterning along the developing root", Victoria V Mironova, Nadya A Omelyanchuk, Guy Yosiphon, Stanislav I Fadeev, Nikolai A Kolchanov, Eric Mjolsness and Vitaly A Likhoshvai. BMC Systems Biology 4:98, 2010.

J46 "A 'Random Steady State' Model for the Pyruvate Dehydrogenase and Alpha-Ketogluterate Dehydrogenase Enzyme Complexes", T. S. Najdi, G. W. Hatfield, and E. D. Mjolsness. Physical Biology, 7 (2010) 016016, 2010.

J45 "Topological index of the p53-Mdm2 circuit", V.P.Golubyatnikov, E.Mjolsness, Yu.A.Gaidov .The Herald of Vavilov Society for geneticists and breeding scientists (Informatzionnyi Vestnik Vavilovskogo obshchestva genetikov i selektzionerov) v. 13, N 1, 2009, pp 160 - 162. In English, 2009.

J44 "An Exact Accelerated Stochastic Simulation Algorithm", E. Mjolsness, D. Orendorff, P. Chatelain, P. Koumoutsakos, Journal of Chemical Physics **130** 144110, 2009.

J43 "Mathematical Model of Auxin Distribution in the Plant Root", V. A. Likhoshvai, N. A. Omel'yanchuk, V. V. Mironova, S. I. Fadeev, E. D. Mjolsness, and N. A. Kolchanov. Russian Journal of Developmental Biology, Vol. 38, No. 6, pp. 374–382, 2007.

J42 "A Model Study of the Role of Proteins CLV1, CLV2, CLV3, and WUS in Regulation of the Structure of the Shoot Apical Meristem", S. V. Nikolaev, A. V. Penenko, V. V. Lavreha, E. D. Mjolsness, and N. A. Kolchanov. Russian Journal of Developmental Biology, Vol. 38, No. 6, pp. 383–388, 2007.

J41 "Towards a Calculus of Biomolecular Complexes at Equilibrium", Eric Mjolsness. Briefings in Bioinformatics, 8(4):226-33 July 2007.

J40 "On Cooperative Quasi-Equilibrium Models of Transcriptional Regulation", Eric Mjolsness. Journal of Bioinformatics and Computational Biology, vol 5 no 2(b) pp 467-490, 2007.

J39 "Stochastic Process Semantics for Dynamical Grammars", Eric Mjolsness and Guy Yosiphon. Annals of Mathematics and Artificial Intelligence, 47(3-4) August 2006.

J38 "Connectivity in the Yeast Cell Cycle Transcription Network: Inferences from Neural Networks", Christopher Hart, Eric Mjolsness, Barbara Wold. PLOS Computational Biology 2(12), December 2006.

J37 "The Growth and Development of Some Recent Plant Models: A Viewpoint", Eric Mjolsness. Journal of Plant Growth Regulation 25(4), 270-277, December 2006.

J36 "Towards Learned Traversability for Robot Navigation: From Underfoot to the Far Field", Andrew Howard, Michael Turmon, Anelia Angelova, Larry Matthies, Benyang Tang, Eric Mjolsness. Journal of Field Robotics 23(11-12), 2006.

J35 "Static and dynamic models of biological networks", Ashish Bhan and Eric Mjolsness. Complexity 11(6), 2006.

J34 "Analysis of a one-dimensional model for the regulation of the size of the renewable zone in biological tissue", S.I. Fadeev**,** S.V. Nikolaev*,* V.V. Kogay**,** E. Mjolsness , N.A. Kolchanov. (In Russian.) Computational Technologies, http://www.ict.nsc.ru/jct/annotation/808?l=eng , 11(2), 2006.

J33 "Application of a Generalized MWC Model for the Mathematical Simulation of Metabolic Pathways Regulated by Allosteric Enzymes", Tarek S. Najdi, Chin-Ran Yang, Bruce E. Shapiro, G. Wesley Hatfield, and Eric D. Mjolsness, Journal of Bioinformatics and Computational Biology, 4:335-355, 2006.

J32 "An auxin-driven polarized transport model for phyllotaxis", Henrik Jönsson, Marcus Heisler, Bruce E. Shapiro, Elliot M. Meyerowitz, Eric Mjolsness. Proceedings of the National Academy of Sciences, 13 January 2006.

J31 "Modeling the Organization of the WUSCHEL Expression Domain in the Shoot Apical Meristem", Henrik Jönsson, Marcus Heisler, G. Venugopala Reddy, Vikas Agrawal, Victoria Gor, Bruce E. Shapiro, Eric Mjolsness, Elliot M. Meyerowitz. Bioinformatics 21(Suppl. 1):i232-i240 June 2005.

J30 "A mathematical and computational framework for quantitative comparison and integration of large scale gene expression data." Hart CE, Sharenbroich L, Bornstein BJ, Trout D. King B., Mjolsness E., and Wold BJ. Nucleic Acids Research, May 10;33(8):2580-94, 2005.

J29 "Sigmoid: Towards an Intelligent, Scalable, Software Infrastructure for Pathway Bioinformatics and Systems Biology", Jianlin Cheng, Lucas Scharenbroich, Pierre Baldi, Eric Mjolsness, IEEE Intelligent Systems, May/June 2005.

J28 "A Mathematical Model for the Branched Chain Amino Acid Biosynthetic Pathways of *Escherichia coli K12*", Chin-Ran Yang, Bruce E. Shapiro, She-pin Hung, Eric D. Mjolsness, and G. Wesley Hatfield, Journal of Biological Chemistry, 2005 Mar 25; 280(12):11224-32 .

J27 "An enzyme mechanism language for the mathematical modeling of metabolic pathways**."** Yang**,** C-R., Shapiro, B.E., Mjolsness, E.D., and Hatfield, G.W.. *Bioinformatics*, vol. 21 no. 6, pages 774–780, March 2005.

J26 "Cellerator: Extending a computer algebra system to include biochemical arrows for signal transduction simulations." Bruce E. Shapiro, Andre Levchenko, Elliot M. Meyerowitz, Barbara J. Wold and Eric D. Mjolsness. Bioinformatics, 19(5):677-678, 2003.

J25 "The systems biology markup language (SBML): a medium for representation and exchange of biochemical network models", M. Hucka, A. Finney, H. M. Sauro, H. Bolouri, J. C. Doyle, H. Kitano , A. P. Arkin , B. J. Bornstein, D. Bray, A. Cornish-Bowden, A. A. Cuellar, S. Dronov, E. D. Gilles, M. Ginkel, V. Gor, I. I. Goryanin, W. J. Hedley, T. C. Hodgman, J.-H. Hofmey, P. J. Hunter, N. S. Juty, J. L. Kasberger, A. Kremling, U. Kummer, N. Le Nov` ere, L. M. Loew, D. Lucio , P. Mendes, E. Minch, E. D. Mjolsness, Y. Nakayama, M. R. Nelson, P. F. Nielsen, T. Sakurada, J. C. Schaff, B. E. Shapiro, T. S. Shimizu, H. D. Spence, J. Stelling. Bioinformatics Vol 19, no 4, pp 524-531, 2003.

J24 "Clustering Analysis of Microarray Gene Expression Data by Splitting Algorithm", Ruye Wang, Lucas Scharenbroich, Christopher Hart, Barbara Wold, and Eric Mjolsness. Journal of Parallel and Distributed Computing. Volume 63, Numbers 7-8, pp. 692-706, July-August 2003.

J23 "Machine Learning for Science: State of the Art and Future Prospects", Eric Mjolsness and Dennis DeCoste, Science 293, 2051-2055, September 14, 2001.

J22 "Strategies for autonomous rovers and Mars", Martha S. Gilmore, Rebecca Castaño, Tobias Mann, Robert C. Anderson, Eric D. Mjolsness, Roberto Manduchi, and R. Stephen Saunders, Journal of Geophysical Research - Planets, December 25 2000.

J21 "Fast and Globally Convergent Pose Estimation from Video Images", C.-P. Lu, G. D. Hager and E. Mjolsness, IEEE Transactions on Pattern Analysis and Machine Intelligence 22(6), 610-622, 2000.

J20 "The Synergy of Biology, Intelligent Systems, and Space Exploration", E. Mjolsness and A. Tavormina, IEEE Intelligent Systems April-May 2000.

J19 "Convergence Properties of the Softassign Quadratic Assignment Algorithm", Anand Rangarajan, Alan Yuille, and Eric Mjolsness, Neural Computation 11(6), 1455-1474 1999.

J18 "A Lagrangian Formulation of Neural Networks I: Theory and Analog Dynamics", Eric Mjolsness and Willard L. Miranker, Neural, Parallel and Scientific Computations vol 6 no. 3, pp. 297-336, 1998.

J17 "A Lagrangian Formulation of Neural Networks II: Clocked Objective Functions and Applications", Willard L. Miranker and Eric Mjolsness, Neural, Parallel and Scientific Computations, vol 6 no. 3, pp. 337-372, 1998.

J16 "New Algorithms for 2D and 3D Point Matching: Pose Estimation and Correspondence", Steven Gold, Chien- Ping Lu, Anand Rangarajan, Suguna Pappu, and Eric Mjolsness, Pattern Recognition vol. 31 no. 8, pp. 1019-1031 August 1998.

J15 "A Robust Point Matching Algorithm for Autoradiograph Alignment", Anand Rangarajan, Haili Chui, Eric Mjolsness, Suguna Pappu, Lila Davachi, Patricia S. Goldman-Rakic, and James S. Duncan, Medical Image Analysis, vol 1 no 4, 1997.

J14 "Lagrangian Relaxation Network for Graph Matching", Anand Rangarajan and Eric Mjolsness, IEEE Transactions on Neural Networks, vol 7 no 6, November 1996.

J13 "A Novel Optimizing Network Architecture with Applications", Anand Rangarajan, Steven Gold, and Eric Mjolsness, Neural Computation, vol 8 no 5, July 1996.

J12 "Learning with Preknowledge: Clustering with Point and Graph Matching Distance Measures", Steven Gold, Anand Rangarajan, and Eric Mjolsness, Neural Computation, vol 8 no 4, May 15 1996. Reprinted in "Unsupervised Learning: Foundations of Neural Computation", eds. G. Hinton and T. J. Sejnowski, MIT Press 1999.

J11 "Online Computation of Exterior Orientation with Application to Hand-Eye Calibration", Chien-Ping Lu, Eric Mjolsness, and Gregory D. Hager, Mathematical and Computer Modelling Journal, vol. 24 no. 5-6, pp. 121-43, September 1996.

J10 "Model for Cooperative Control of Positional Information in Drosophila by bcd and Maternal hb", John Reinitz, Eric Mjolsness and David H. Sharp, Journal of Experimental Zoology 271:47-56, 1995.

J9 "Optimization Dynamics for Partitioned Neural Networks", Dimitris I. Tsioutsias and Eric Mjolsness. International Journal of Neural Systems, December 1994.

J8 "Accelerating Neural Net Dynamics by Boundary Layer Methods", Willard L. Miranker and Eric Mjolsness, Applied Mathematics Letters, vol 6, no 3, pp. 85-89, 1993.

J7 "Multiscale Models of Developmental Processes" David H. Sharp, John Reinitz, and Eric Mjolsness, Open Systems and Information Dynamics, vol 2 no 1, pp. 1-10, Nicholas Copernicus University Press, Torun, Poland, 1993.

J6 "A Center-of-Mass Computation Describes the Precision of Random Dot Displacement Discrimination", by Joy Hirsch and Eric Mjolsness,Vision Research, vol 32 no 2, pp 335-346, February 1992.

J5 "A Connectionist Model of Development", Eric Mjolsness, David H. Sharp, and John Reinitz, Journal of Theoretical Biology, vol 152 no 4, pp. 429-454, 1991.

J4 "Multiscale Optimization in Neural Networks", by Eric Mjolsness, Charles Garrett, and Willard Miranker, IEEE Transactions on Neural Networks, vol 2 no 2, March 1991.

J3 "Algebraic Transformations of Objective Functions", Eric Mjolsness and Charles Garrett, Neural Networks, vol 3, no 6, pp. 651-669, 1990.

J2 "Optimization in Model Matching and Perceptual Organization", Eric Mjolsness, Gene Gindi, and P. Anandan. Neural Computation, vol 1 no 2, Summer 1989.

J1 "Scaling, Machine Learning, and Genetic Neural Nets", Eric Mjolsness, David H. Sharp, and Bradley K. Alpert. Advances in Applied Mathematics, June 1989.

BOOK CHAPTERS

B18 "A Pycellerator Tutorial", Bruce Shapiro and Eric Mjolsness. In Modeling Biomolecular Site Dynamics, edited by William Hlavacek, in Methods in Molecular Biology book series, no. 1945, Springer, 2019.

B17 "Computational Analysis of Live Cell Images of the *Arabidopsis thaliana* Plant." Alexandre Cunha, Paul T. Tarr, Adrienne H. K. Roeder, Alphan Altinok, Eric Mjolsness, Elliot M. Meyerowitz. In *Computational Methods in Cell Biology*, eds. Anand Asthagiri and Adam Arkin, pp. 288-323, Elsevier Academic Press, 2012.

B16 Denis Ponomaryov, Nadezhda Omelianchuk, Victoria Mironova, Eugene Zalevsky, Nikolay Podkolodny, Eric Mjolsness, and Nikolay Kolchanov, "From Published Expression and Phenotype Data to Structured Knowledge: The Arabidopsis Gene Net Supplementary Database and Its Applications". In K.E. Wolff et al. (Eds.): Proceedings of KONT/KPP 2007, Springer Lecture Notes in Artificial Intelligence (LNAI) 6581, pp. 101–120, 2011.

B15 "A Scalable and Integrative System for Pathway Bioinformatics and Systems Biology", B. Compani, T. Su, I. Chang, J. Cheng, K. Shah, T. Whisenant, Y. Dou, A. Bergmann, R. Cheong, L. Bardwell, A. Levchenko, B.Wold, P. Baldi, E. Mjolsness, ed. Hamid R. Arabnia. In "Advances in Computational Biology" to be published by Springer (in book series: Advances in Experimental Medicine and Biology, ISBN: 978-1-4419-5912-6), 2010.

B14 "Towards the Inference of Stochastic Biochemical Network and Parameterized Grammar Models", Yosiphon, G. and E. Mjolsness. In N. Lawrence , M. Girolami, M. Rattray, and G. Sanguinetti eds., *Learning and Inference in Computational Systems Biology,* MIT Press, 2010.

B13 "A Software Architecture for Developmental Modeling in Plants: The Computable Plant Project", Victoria Gor, Bruce E. Shapiro, Henrik Jönsson, Marcus Heisler, G. Venugopola Reddy, Elliot M. Meyerowitz and Eric Mjolsness. In: Bioinformatics of Genome Regulation and Structure II, (Eds. N. Kolchanov and R. Hofestaedt) Springer Science+Business Media, Inc. 2005, pp. 345-354.

B12 "AGNS—A Database on expression of *Arabidopsis* Genes**". Nadezhda Omelyanchuk, Viktoria Mironova, Aleksander Poplavsky, Nikolay Podkoldny, Nikolay Kolchanov, Eric Mjolsness, Elliot Meyerowitz. In Bioinformatics of Genome Regulation and Structure, Second Biennial Volume", (Eds. N.Kolchanov and R. Hofestaedt) Springer Science+Business Media, Inc. 2005.

B11 "Gene Network Models and Neural Development," George Marnellos and Eric D. Mjolsness. In Modeling Neural Development, edited by Arjen van Ooyen. The MIT Press, Cambridge, Massachusetts, 2003.

B10 "Signaling in Multicellular Models of Plant Development." H. Jönsson, B. E. Shapiro, E. M. Meyerowitz and E. Mjolsness (2003). In S. Kumar and P.J. Bentley

(Eds.) "On Growth, Form, and Computers", Academic Press, London, UK, pages 156-161, 2003.

B9 "Modeling plant development with gene regulation networks including signaling and cell division." Mjolsness E, Jönsson H, Shapiro BE, Meyerowitz EM (2003) in Bioinformatics of Genome Regulation and Structure, eds R. Hofestaedt and N. Kolchanov, Kluwer Publications.

B8 "Automatic model generation for signal transduction with applications to MAP-kinase pathways", B. E. Shapiro, A. Levchenko, E. Mjolsness. In Foundations of Systems Biology, ed. H. Kitano, MIT Press 2001.

B7 "Gene Regulation Networks for Modeling Drosophila Development", Eric Mjolsness, in Computational Methods in Molecular Biology, eds. J. M. Bower and H. Bolouri, MIT Press 2001, pp. 101-118.

B6 "Modeling the Activity of Single Genes", Michael Gibson and Eric Mjolsness, in Computational Methods in Molecular Biology, eds. J. M. Bower and H. Bolouri, MIT Press 2001, pp. 1-48.

B5 "Symbolic Neural Networks Derived from Stochastic Grammar Domain Models", Eric Mjolsness, in Connectionist Symbolic Integration, eds. R. Sun and F. Alexandre, Lawrence Erlbaum Associates, 1997.

B4 "Modeling the Connection between Development and Evolution: Preliminary Report", Eric Mjolsness, Charles D. Garrett, John Reinitz, and David H. Sharp, in Evolution and Biocomputation: Computational Models of Evolution eds. Wolfgang Banzhaf and Frank H. Eeckman, Lecture Notes in Computer Science, Springer, Berlin, 1995. (http://dx.doi.org/10.1007/3-540-59046-3_7.)

B3 "Connectionist Grammars for High-Level Vision", Eric Mjolsness, in Artificial Intelligence and Neural Networks: Steps Toward Principled Integration, eds. Vasant Honavar and Leonard Uhr, Academic Press, 1994.

B2 "A Connectionist Model of the Drosophila Blastoderm", J. Reinitz, E. Mjolsness, and D. H. Sharp, in The Principles of Organization in Organisms, eds. Jay E. Mittenthal and Arthur B. Baskin, Santa Fe Institute Studies in the Sciences of Complexity, Addison-Wesley 1992.

B1 "Neural Networks for Model-Based Recognition", Gene Gindi, Eric Mjolsness, and P. Anandan, in Neural Networks: Concepts, Applications, and Implementations, Volume III, eds. P. Antognetti and V. Milutinovic, pp 144-173, Prentice Hall 1991.

Abstracts

A19.1."Some Prospects for Artificial Intelligence (Both Numeric and Symbolic) in Multiscale Biophysics", Eric Mjolsness, Oliver K. Ernst, Thomas M. Bartol, Terrence J. Sejnowski. Biophysical Journal, Volume 116, Issue 3, Supplement 1, 15 February 2019, Page 323a. URL: https://www.sciencedirect.com/science/article/pii/S0006349518330182

A9.1 Keith Booher, Bryan Bell, Tarek Najdi, Todd Johnson, Eric Mjolsness, Craig Walsh and Peter Kaiser, "Cancer cell methionine dependency". Published May 2009 In: Proc Am Assoc Cancer Res; 2009 Apr 18-22; Denver, CO. Philadelphia (PA): AACR; 2009. Abstract nr 3411. URL: http://cancerres.aacrjournals.org/content/69/9_Supplement/3411.short .

Recent Talks and Presentations

RTP 19.4 "Symbolic and Numeric AI for Complex Spatial Biological Models", Eric Mjolsness. Invited talk at Center for Nonlinear Studies (CNLS), Los Alamos National Laboratory, May 30 2019.

RTP 19.4 "Operator algebra dynamics for spatially embedded labelled graphs", Eric Mjolsness. "In Machine Learning for Computational Fluid and Solid Dynamics", Center for Nonlinear Studies workshop, Santa Fe NM, February 20 2019.

RTP19.2 "Mathematical visions for AI/ML in the natural sciences: Particles, fields, structures, and complexity at multiple scales", Eric Mjolsness. March 11, 2019.

RTP 19.1 Same as A19.1. Invited talk at the Biophysical Society Annual Meeting, Member Organized Session: Multiscale Modeling of Biophysical Systems, organized by Denis Tsygankov. March 5, 2019.

RTP 18.5 "Model Reduction from Non-Equilibrium to 'Dynamic Boltzmann Models' of Reaction-Diffusion Networks", Eric Mjolsness. Invited talk at the workshop on Nonequilibrium Physics in Biology, Simons Center for Geometry and Physics, SUNY Stony Brook, December 3 2018.

RTP 18.4 "Advances in Modeling for Extended Objects in Biology", Eric Mjolsness. Human Frontiers Science Program, Olivier Hamant (PI) project kickoff meeting, Lyon France, November 12 2018.

RTP 18.3 "Smart Modeling for Complex Biological Systems" Eric Mjolsness. Department Colloquium, San Diego State University, September 21, 2018.

RTP 18.2 "Multigrid Optimization over Graph Lineages, with Applications to ANN Training", Cory Scott (presenter) and Eric Mjolsness. Fifteenth Copper Mountain Conference on Iterative Methods, March 30 2018.

RTP 18.1 "Multiscaling with Learning in Stochastic Physical Models", Eric Mjolsness. Invited talk at the workshop "Physics-Informed Machine Learning", Santa Fe NM, January 22 2018.

RTP 17.7 "Towards a Mathematical Architecture for more Flexible Scientific Modeling", Eric Mjolsness. Talk at the workshop "Mathematics for Developmental Biology" (17w5164), Banff International Research Station (BIRS), Banff Alberta Canada December 2017.

RTP 17.6 "Towards Artificial Intelligence and Machine Learning Methods for Modeling Plant Biology", Computational Workshop, Sainsbury Laboratory Cambridge University, August 28 2017.

RTP 17.5 "Machine Learning of Dynamic Boltzmann Distributions for Multiscale Modeling", Oliver K. Ernst, Tom Bartol, Terrence Sejnowski, and Eric Mjolsness. Q-Bio 2017. Delivered by PhD student Oliver Ernst.

RTP 17.4 "Network Inference on GRN Time Series", Dustin Maurer and Eric Mjolsness. Poster presentation at Q-Bio 2017, delivered by PhD student Dustin Maurer.

RTP 17.3 "Towards Artificial Intelligence and Machine Learning Methods for Automating Computational Science", talk at the Center for Non-Linear Studies, Los Alamos National Laboratory. May 15, 2017.

RTP 17.2 "Directions for Research on AI for Multiscale Modeling in GRNs, Plants, and Brains", Eric Mjolsness, Invited talk at the UCI Center for Complex Biological Systems Retreat, April 2 2017. Accompanying poster by Dustin Maurer and Eric Mjolsness.

RTP 17.1 "An algebraic multigrid approach to scalable graphs for multiscale modeling", Eric Mjolsness and Cory Scott. Talk with refereed abstract at the 18th Copper Mountain Conference on Multigrid Methods, March 18, 2017.

RTP 16.8 "Declarative Modeling Methods for Multiscale Morphodynamics", Eric Mjolsness. Invited talk at the Interdisciplinary Workshop on Multi-Scale Modeling of Complex Systems in Developmental and Plant Biology, UC Riverside, 15 December 2016.

RTP 16.7 "Gene Regulatory Network Modeling with Neural Network ODEs", Dustin Maurer and Eric Mjolsness. Award-winning poster at the SoCal Machine Learning Symposium, California Institute of Technology, 18 November 2016.

RTP 16.6 "Numerical Results on Directed Graph Process Distances for Model Architectures: Inter and Intra-Lineage", Eric Mjolsness and Cory Scott. Poster at the SoCal Machine Learning Symposium, California Institute of Technology, 18 November 2016.

RTP 16.5 "Dynamic Spatial Boltzmann Distributions". Oliver Ernst, Tom Bartol, Terrence Sejnowski, and Eric Mjolsness. Poster presentation at Q-Bio 2016, Vanderbilt University, Nashville, TN, August 2016.

RTP 16.4 "Learning Genetic Regulatory Networks from Expression Data in *Xenopus* Embryo", Dustin Maurer, Ira Blitz, Margaret Fish, Aaron Zorn, Ken Cho, Eric Mjolsness. Poster presentation at Q-Bio 2016, Vanderbilt University, Nashville, TN, August 2016.

RTP 16.3 "Xenopus Endoderm GRN Modeling Pipeline", Dustin Maurer and Eric Mjolsness. Southern California Machine Learning Symposium, UC Irvine, May 20, 2016.

RTP 16.2 "Numerical Bounds on Directed Graph Process Distances for Model Architectures: Inter and Intra-Lineage", Cory Scott and Eric Mjolsness. Southern California Machine Learning Symposium, UC Irvine, May 20, 2016.

RTP 16.1 "Xenopus Endoderm GRN Modeling Pipeline", Dustin Maurer and Eric Mjolsness. Center for Complex Biological Systems Annual Retreat, Los Angeles CA, March 19 2016.

RTP 15.5 "Mathematics of Declarative Developmental Modeling", Fourth Computational Biology Workshop, Sainsbury Laboratory, University of Cambridge, June 17 2015.

RTP 15.4 "Connecting Biology to Mathematics by way of Symbolic Computing", Leverhulme Lecture, Sainsbury Laboratory, University of Cambridge, June 17 2015.

RTP 15.3 "Progress in Quantitative Symbolic Modeling Languages and Methods", Workshop on Deep Learning: Theory, Algorithms, and Applications, Bertinoro, Italy, May 26, 2015.

RTP 15.2 "SLCU Work Agenda", Sainsbury Laboratory, University of Cambridge, January 28, 2015.

RTP 15.1 "BioSystem Modeling Methods at Network-Adjacent Scales", guest lecture in Computational Systems Biology class, University of Cambridge, January 26 2015.

RTP 14.10, "Algebraic Type Semantics for Hierarchical Model Architectures", Poster at Neural Information Processing Systems (NIPS) Workshop on Probabilistic Programming, December 2014. Poster presentation corresponding to refereed extended abstract C80.

RTP 14.9, "Mathematical Artificial Intelligence for Computational Science", Center for Non-Linear Studies Seminar, Los Alamos National Laboratory, October 21, 2014.

RTP 14.8, "Model Reduction for Stochastic CaMKII Reaction Kinetics in Synapse", extended abstract and poster, Eighth Q-Bio Conference, Santa Fe New Mexico, August 14 2014.

RTP 14.7, "Biosystem Modeling at Multiple Scales", tutorial, Eighth Q-Bio Conference, August 13 2014.

RTP 14.6 "Probabilistic Programming using Computer Algebra", oral presentation at DARPA PPAML PIs meeting, Portland, July 10 2014.

RTP 14.5 "Algebraic Types for Model Architectures", poster presentation at DARPA PPAML PIs meeting, Portland, July 7 2014.

RTP 14.4 "Quantitative Symbolic Process Models: A Unified Approach", oral presentation at Shonan meeting "Deep Learning: Theory Algorithms, Applications", Shonan Japan, May 20 2014.

RTP 14.3 "Architectures via Algebraic Indexing", oral presentation at DARPA PPAML PIs meeting, Boston, April 24 2014.

RTP 14.2 "Quantitative Modeling Languages for Computational Biology", Computational Science Research Center Colloquium, San Diego State University, April 18 2014.

RTP 14.1 "Quantitative Modeling Languages for Artificial Intelligence and Biology", Computer Science and Engineering Department Colloqium, UC Riverside, January 10 2014.

OTHER JOURNAL PAPERS

OJP1 "An International Bioinformatics Infrastructure to Underpin the Arabidopsis Community", by the International Arabidopsis Informatics Consortium. The Plant Cell 22:2530-2536, Aug 31 2010. E. Mjolsness is one of about 50 Consortium members named in the paper, resulting from discussions in Washington DC in May 2010, organized by the North American Arabidopsis Steering Committee.

PATENTS

PT2 "Cellerator", Bruce E. Shapiro, Eric D. Mjolsness, and Andre Levchenko, Provisional Patent, November 2000. United States Patent 7,319,945 B1, January 15, 2008.

PT1 "Analysis of Ultrasound Images in the Presence of Contrast Agent", Howard C. Dittrich, Harold Levene, and Eric Mjolsness. United States Patent 5,776,063, July 7, 1998.

REFEREED CONFERENCES (major conferences)

C82 "Multigrid Optimization over Graph Lineages, with Applications to ANN Training", Cory Scott (presenter) and Eric Mjolsness. Fifteenth Copper Mountain Conference on Iterative Methods, March 30 2018. Same as RTP 18.2.

C81 "An algebraic multigrid approach to scalable graphs for multiscale modeling", Eric Mjolsness and Cory Scott. Talk with refereed abstract at the 18th Copper Mountain Conference on Multigrid Methods, March 18, 2017. Same as RTP 17.1.

C80 "Algebraic Type Semantics for Hierarchical Model Architectures", Poster at Neural Information Processing Systems (NIPS) Workshop on Probabilistic Programming, December 2014 (http://probabilistic-programming.org/wiki/NIPS*2014_Workshop). Refereed extended abstract (3 pages) corresponding to poster presentation RTP 14.10.

C79 "Quantitative Symbolic Process Models: How a Fair Fraction of Intelligence Could be Abstracted in AI Research". Refereed extended abstract (2 pages) corresponding to poster RTP 13.8, AAAI Fall Symposium on "How Should Intelligence be Abstracted in AI Research", November 15-16, Washington DC 2013. In AAAI Technical Report FS-13-02, https://www.aaai.org/Press/Reports/Symposia/Fall/fs-13-02.php, American Association for Artificial Intelligence, 2013.

C78 "Problems of Type Theory and Regularization for Morphodynamics", abstract and poster presentation, The Seventh Annual q-bio Conference on Cellular Information Processing (Q-Bio), August 8 2013. (Abstract version of poster in RTP13.3.)

C77 "Compositional Stochastic Modeling and Probabilistic Programming", Eric Mjolsness, Workshop on Probabilistic Programming, Neural Information Processing Systems Conference Workshops, extended abstract, December 2012. Also available as arXiv:1212.0582 .

C76 "Topological object types for morphodynamic modeling languages", Eric Mjolsness and Alexandre Cunha, PMA 2012 : IEEE Fourth International Symposium on Plant Growth Modeling, Visualization and Applications. Shanghai China, October 2012. IEEE Press.

C75 "Eigenstate Analysis of Trivalent Reactions", Eric Mjolsness and Upendra Prasad, Poster and abstract, Q-Bio 2011: The Fifth Annual q-bio Conference on Cellular Information Processing, Santa Fe New Mexico, August 2011.

C74 "Using Geometric Markers to Predict the Cell Division Plane in Meristem Cells", Bruce E. Shapiro, Marcus Heisler, Cory Tobin, Alexandre Cunha, Andrew Davis, Eric D. Mjolsness and Elliot M. Meyerowitz. Proceedings of the 6th International Workshop on Functional-Structural Plant Models, Theodore DeJong and David Da Silva, eds. Sept 12-17 2010, University of California, Davis.

C73 "Towards Measurable Types for Dynamical Process Modeling Languages", Eric Mjolsness. Proceedings of the 26th Conference on Mathematical Foundations of Programming Semantics (MFPS 2010). Electronic Notes in Theoretical Computer Science (ENTCS), vol. 265, pp. 123-144, 6 Sept. 2010, Elsevier. DOI 10.1016/j.entcs. 2010.08.008. (*Same as J49.*)

C72 "Topological Index of a Model of p53 Dynamics Triggered by DNA Damage", V. P. Golubyatnikov and E. Mjolsness, 6th International Conference on the Bioinformatics of Genome Regulation and Structure BGRS 2008.

C71 "Finite Element Modeling of Mechanical Properties of Plant Cells in Arabidopsis thaliana", Pawel Krupinski, Marcus Heisler, Patrick Hung, Elliot Meyerowitz, and Eric Mjolsness, Poster and Proceedings extended abstract, ICSB 2007: The Eighth International Conference on Systems Biology, Long Beach California, Oct 2-4 2007.

C70 "1D Modeling of Auxin Distribution in Plant Roots", Vitaly V. Likhoshvai, Victoria V. Mironova, Nadya A. Omelianchuk, Stanislav I. Fadeev, Nikolay A. Kolchanov, and Eric D. Mjolsness, Poster and Proceedings extended abstract, ICSB 2007: The Eighth International Conference on Systems Biology, Long Beach California, Oct 2-4 2007.

C69 "Modeling of the Shoot Apical Meristem Structure Regulation Based on CLV1, CLV2, CLV3 and WUS Interactions", Sergey Nikolaev, Alexey Penenko, Viktoriya Lavreha, Pavel Smal, Eric Mjolsness, and Nikolay Kolchanov Poster and Proceedings extended abstract, ICSB 2007: The Eighth International Conference on Systems Biology, Long Beach California, Oct 2-4 2007.

C68 "Sigmoid: A Scalable System for Pathway Bioinformatics and Systems Biology", Behnam Compani-Tabrizi, Trent Su, Ivan Chang, Thomas Whisenant, Kandarp Shah, Pierre Baldi, Lee Bardwell, and Eric Mjolsness, Poster and Proceedings extended abstract, ICSB 2007: The Eighth International Conference on Systems Biology, Long Beach California, Oct 2-4 2007.

C67 "Platforms for Modeling in Systems Biology: Recent Developments in MathSBML and Cellerator", Bruce E. Shapiro, James Lu, Michael Hucka, Eric D. Mjolsness, Poster and Proceedings extended abstract, ICSB 2007: The Eighth International Conference on Systems Biology, Long Beach California, Oct 2-4 2007.

C66 "Integrating system for segmenting and tracking fluorescent objects on the image data of growing cell colonies", Tigran Bacarian and Eric Mjolsness, Poster and Proceedings extended abstract, ICSB 2007: The Eighth International Conference on Systems Biology, Long Beach California, Oct 2-4 2007.

C65 "Dynamic Pathway Modeling of DNA Damage Response System and Parameter Estimation", Li Zhang and Eric Mjolsness, Poster and Proceedings extended abstract, ICSB 2007: The Eighth International Conference on Systems Biology, Long Beach California, Oct 2-4 2007.

C64 "Enzyme-mechanism models and simulations of central metabolism pathways and amino acid biosynthesis in Escherichia coli", Tarek S. Najdi, Chin-Rang Yang, Bruce E. Shapiro, G. Wesley Hatfield, and Eric D. Mjolsness, Poster and Proceedings extended abstract, ICSB 2007: The Eighth International Conference on Systems Biology, Long Beach California, Oct 2-4 2007.

C63 "High-accuracy R-leaping: Implementing and Exploring a Potentially Exact method for Accelerated Stochastic Simulation" D. Orendorff, P. Chatelain, P. Koumoutsakos, and E. Mjolsness, Poster and Proceedings extended abstract, ICSB 2007: The Eighth International Conference on Systems Biology, Long Beach California, Oct 2-4 2007.

C62 "Dynamical Grammar Modeling of Cellular Proliferative Dynamics in the Olfactory Epithelium", G. Yosiphon, K. K. Gokoffski, A. L. Calof, A. D. Lander, E. Mjolsness. Poster and Proceedings extended abstract, ICSB 2007: The Eighth International Conference on Systems Biology, Long Beach California, Oct 2-4 2007.

C61 "New Mathematical Methods for Systems Biology", Eric Mjolsness. Tutorial (oral presentation and written notes), International Conference on Systems Biology, October 8 2006. Also October 1 2007.

C60 "Systems Biology Software Support in Mathematica: New Developments in Cellerator", B. E. Shapiro, A. Vorobyov, J. G. Murakami, E. D. Mjolsness. Poster presentation, International Conference on Systems Biology, 9-10 October 2006.

C59 "Simplified models of growth for cells and tissues", Eric Mjolsness, Sergey Nikolaev, Przemek Prusinkiewicz, Alex Sadovsky, S. Fadeev, and Nikolay Kolchanov, Poster presentation, International Conference on Systems Biology, October 9-10 2006.

C58 "An auxin transport model for regulation of plant organ initiation", Henrik Jönsson, Marcus Heisler, Bruce E. Shapiro, Elliot M. Meyerowitz, and Eric Mjolsness, Poster presentation, International Conference on Systems Biology, October 9-10 2006.

C57 "Modeling transcriptional regulation with equilibrium molecular complex composition", Mjolsness E., 5th International Conference on the Bioinformatics of Genome Regulation and Structure (BGRS 2006), Volume 1, pp. 118-121. July 2006.

C56 "A one-dimensional model for the regulation of the size of the renewable zone in biological tissue", Nikolaev SV, Fadeev SI, Kogai VV, Mjolsness E, Kolchanov NA . 5th International Conference on the Bioinformatics of Genome Regulation and Structure (BGRS 2006), Volume 2, pp. 213-217. July 2006.

C55 "A system for simulation of 2D plant tissue growth and development", Nikolaev SV, Penenko AV, Belavskaya VV, Mjolsness E, Kolchanov NA. 5th International Conference on the Bioinformatics of Genome Regulation and Structure (BGRS 2006), Volume 2, pp. 218-22. July 2006.

C54 "AGNS (*Arabidopsis* GenNet Supplementary Database), release 3.0", Omelianchuk NA, Mironova VV, Poplavsky AS, Pavlov KS, Savinskaya SA, Podkolodny NL, Mjolsness ED, Meyerowitz EM, Kolchanov NA. 5th International Conference on the Bioinformatics of Genome Regulation and Structure (BGRS 2006), Volume 2, pp. 223-226. July 2006.

C53 "Semantically rich ontology of anatomical structure and development for *Arabidopsis thaliana*", Ponomaryov D, Omelianchuk N, Kolchanov N, Mjolsness E, Meyerowitz E. ., 5th International Conference on the Bioinformatics of Genome Regulation and Structure (BGRS 2006), Volume 2, pp. 227-230. July 2006.

C52 "A program method of constructing ontology of phenotypic abnormalities for *Arabidopsis thaliana*", Ponomaryov D, Omelianchuk N, Mironova V, Kolchanov N, Mjolsness E, Meyerowitz E., 5th International Conference on the Bioinformatics of Genome Regulation and Structure (BGRS 2006), Volume 2, pp. 231-234. July 2006.

C51 "An integration of the descriptions of gene networks and their models presented in Sigmoid (Cellerator) and GeneNet", Podkolodny NL, Podkolodnaya NN, Miginsky DS, Poplavsky AS, Likhoshvai VA, Compani B, Mjolsness E., 5th International Conference on the Bioinformatics of Genome Regulation and Structure (BGRS 2006), Volume 3, pp. 86-90. July 2006.

C50 "Stochastic Process Semantics for Dynamical Grammar Syntax: An Overview", Eric Mjolsness. Proceedings of the Ninth International Symposium on Artificial Intelligence and Mathematics, January 2006. Also arXiv preprint www.arXiv.org/pdf/cs.AI/0511073.

C49 "The Generalized Monod, Wyman, Changeux Model for Mathematical Modeling of Metabolic Enzymes with Allosteric Regulation" Tarek S. Najdi, Chin-Rang Yang, Bruce E. Shapiro, G. Wesley Hatfield and Eric D. Mjolsness. IEEE Computational Systems Bioinformatics Conference, Stanford University, August 8-12 2005.

C48 "Tracking Cell Signals in Fluorescent Images", Victoria Gor, Tigran Bacarian, Michael Elowitz, Eric Mjolsness. Computer Vision Methods for Bioinformatics (CVMB) workshop at Computer Vision and Pattern Recognition (CVPR). June 2005.

C47 "Modeling the Organization of the WUSCHEL Expression Domain in the Shoot Apical Meristem", Henrik Jönsson, Marcus Heisler, G. Venugopala Reddy, Vikas Agrawal, Victoria Gor, Bruce E. Shapiro, Eric Mjolsness, Elliot M. Meyerowitz. Intelligent Systems in Molecular Biology (ISMB) 2005.

C46 "A Multicellular Model of a Feedback Network Regulating Spatial Gene Expression Domains in the Shoot Apical Meristem", Henrik Jönsson, Bruce E. Shapiro, Victoria Gor, Marcus Heisler, G. Venugopala Reddy, Elliot M. Meyerowitz, and Eric Mjolsness, International Conference on Systems Biology (ICSB 2004), Heidelberg, Germany. 2004.

C45 "A Software Architecture for Developmental Modeling in Plants: The Computable Plant Project", V. Gor, B. E. Shapiro, H. Jönsson, M. Heisler, G. Venugopala Reddy, E. Meyerowitz, E. Mjolsness. 4th International Conference on Bioinformatics of Genome Regulation and Structure (BGRS 2004), Novosibirsk, Russia, July 2004.

C44 "Gene Expression Clustering with Functional Mixture Models", Padhraic Smyth, Darya Chudova, Christopher Hart, Eric Mjolsness, Advances in Neural Information Processing Systems (NIPS) 2003.

C43 "Translation-Invariant Mixture Models for Curve Clustering", Darya Chudova, Scott Gaffney, Eric Mjolsness, Padhraic Smyth. Knowledge Discovery and Data Mining Conference (KDD) 2003.

C42 "Inferring Gene Regulatory Network Models for Plant Stem Cell Regulation", Henrik Jönsson, Elliot M. Meyerowitz, Eric Mjolsness. International Conference on Systems Biology (ICSB 2003), November 2003.

C41 "Resources and Signaling in Multicellular Models of Plant Development", Henrik Jönsson, Eric Mjolsness, Bruce E. Shapiro, 3rd International Conference on Systems Biology (ICSB 2002), Stockholm, Sweden December 2002.

C40 "Modeling Plant Development with Gene Regulation Networks Including Signaling and Cell Division", Eric Mjolsness, Henrik Jönsson, Bruce E. Shapiro, Elliot Meyerowitz. 3rd International Conference on Bioinformatics of Genome Regulation and Structure (BGRS 2002), Novosibirsk, Russia, July 2002.

C39 "Automating Operational and Science Analysis Processes With the Autonomous Sciencecraft Constellation (ASC)", A. G. Davies, R. Greeley, V. Baker, K. K. Williams, J. Dohm, R. Castaño, E. Mjolsness, J. Roden, T. Stough, S. Chien, R. Sherwood, P. Zetocha, and the ASC-Techsat 21 Team, Lunar and Planetary Science Conference, Houston TX, March 2002.

C38 "Can tectonic and fluvial structures be used to date a planetary surface?", Tatiana Vinogradova, R. C. Anderson, and Eric Mjolsness, Lunar and Planetary Science Conference, Houston TX, March 2002.

C37 "Observing active volcanism on Earth and beyond with an autonomous science investigation capability". Ashley Gerard Davies, Wolfgang Fink, Rebecca Castaño,Anthony Barrett, Eric Mjolsness, Michael Burl. American Geophysical Union, San Francisco CA, December 2001.

C36 "Developmental Simulations with Cellerator", B. E. Shapiro, E. Mjolsness. Paper presented at the *Second International Conference on Systems Biology*, Pasadena, CA, November 2001.

C35 "Systematic evaluation of automated geological feature detection methods for impact craters", Tatiana Vinogradova, Michael Burl, Eric Mjolsness, American Geophysical Union, San Francisco CA, December 2001.

C34 "A Relationship between Spline-Based Deformable Models and Weighted Graphs in Non-Rigid Matching",. International Conference on Computer Vision and

Pattern Recognition Anand Rangarajan, Haili Chui, Eric Mjolsness 897-904. `http://doi.ieeecomputersociety.org/10.1109/CVPR.2001.990617, 2001.`

C33 "Automatic model generation for signal transduction with applications to MAP-kinase pathways", B. E. Shapiro, A. Levchenko, E. Mjolsness. First International Conference on Systems Biology (ICSB 2000), Tokyo Japan November 2000.

C32 "Using Scaled Visual Texture for Autonomous Rock Clustering", R. C. Anderson, R. Castaño, T. Stough, V. Gor, and E. Mjolsness, Abstract 2103, Lunar and Planetary Science Conference 2001.

C31 "Autonomous Rover-Based Scientific Investigations Using Invertible Mathematical Models", E. Mjolsness, A. G. Davies, R. Castaño, W. Fink, and J. Z. Lou, American Geophysical Union Fall Meeting December 2000 (poster).

C30 "Autonomous Rock Identification Using Visual Texture", Robert C. Anderson, Rebecca Castaño, Eric Mjolsness, Ashley Davies, Justin Fox, Tim Stough, and Martha Gilmore, abstract 52768, Geological Society of America, Reno NV November 2000.

C29 "Applications of Artificial Intelligence for Spacecraft Autonomy and Enhanced Science Data Return", David J. Atkinson, Steve A. Chien, Eric D. Mjolsness, American Institute of Aeronautics and Astronautics Space 2000, September 2000.

C28 "Software Platform for Systems Biology". Adam Arkin, Hamid Bolouri, Mark T. Borisuk, John Doyle, Koji, M. Kyoda, Eric Mjolsness, Mineo Morohashi, Hiroaki Kitano, RECOMB 2000 : The Fourth Annual International Conference on Computational Molecular Biology , Tokyo, Japan , April 8 - 11, 2000 (poster).

C27 "Reverse Engineering in Systems Biology: Towards Inference of a Gene Regulatory Network", Mineo Morohashi, Koji M. Kyoda, Shuichi Onami, Eric Mjolsness, Hiroaki Kitano, RECOMB 2000 : The Fourth Annual International Conference on Computational Molecular Biology, Tokyo, Japan , April 8 - 11, 2000 (poster).

C26 "Delta-Notch lateral inhibitory patterning in the emergence of ciliated cells in Xenopus: Experimental observations and a gene network model", G. Marnellos, G. A. Deblandre, E. Mjolsness, C. Kintner. Pacific Symposium on Biocomputing, pp. 329-40, 2000.

C25 "A new distance measure for non-rigid image matching", Anand Rangarajan, Haili Chui and Eric Mjolsness, Energy Minimization Methods in Computer Vision

and Pattern Recognition (EMMCVPR), Edwin Hancock and Marcello Pelillo,editors, pages 237-252, Springer, 1999.

C24 "Robotic Geologists at Mars", M. S. Gilmore, R. Castaño, T. Mann, E. Mjolsness, R. C. Anderson, R. Manduchi, R. S. Saunders, American Geophysical Union Fall Meeting, Dec. 1999.

C23 "From Coexpression to Coregulation: An Approach to Inferring Transcriptional Regulation among Gene Classes from Large-Scale Expression Data", E. Mjolsness, T. Mann, R. Castaño, and B. Wold. Advances in Neural Information Processing Systems 1999.

C22 "An Integrated System for Multi-Rover Scientific Exploration", Tara Estlin, Tobias Mann, Alexander Gray, Gregg Rabideau, Rebecca Castaño, Steve Chien, and Eric Mjolsness, Proceedings of the American Association for Artificial Intelligence conference, July 1999.

C21 "Texture Analysis for Mars Rover Images", R. Castaño, T. Mann and E. Mjolsness, Applications of Digital Image Processing XXII, Proc. SPIE Vol 3808, July 1999.

C20 "An Integrated Architecture for Cooperating Rovers", T. Estlin, S. Hayati, A. Jain, J. Yen, G. Rabideau, R. Castaño, R. Petra, S. Peters, D. Decoste, E. Tunstel, S. Chien, E. Mjolsness, R. Steele, D. Mutz, A. Gray, T. Mann, International Symposium on Artificial Intelligence Robotics and Automation in Space (ISAIRAS), 1999.

C19 "Hypothesis-driven Active Data Analysis of Geological Phenomena Using Semi-autonomous Rovers: Exploring Simulations of Martian Hydrothermal Deposits", A. G. Davies, E. D. Mjolsness, A. G Gray, T. P. Mann, R. Castaño, T. A. Estlin and R. S. Saunders, Amer. Geophys. U. Spring Meeting (abstract) 1999.

C18 "Morphogenesis in Plants: Modeling the Shoot Apical Meristem, and Possible Applications", E. Mjolsness, E. Meyerowitz, V. Gor, and T. Mann. Proceedings, 1999 NASA Workshop on Evolvable Hardware.

C17 "Clustering Methods for the Analysis of C. elegans Gene Expression Array Data", E. Mjolsness, R. Castaño, T. Mann, J. Roden, A. Gray, B. Wold, Pacific Symposium on Biocomputing (poster), Mauna Lani, Hawaii, January 1999.

C16 "Spectroscopic Measurements at Silver Lake, CA Testbed for the FIDO Rover", M. S. Gilmore, R. S. Saunders, R. Castaño, T. Mann, E. Mjolsness, and T. L. Roush, American Geophysical Union Fall Meeting (abstract), December 1998.

C15 "Effect of Distance and Azimuth on Spectroscopic Measurements at Silver Lake, CA", M. S. Gilmore, R. Castaño, T. Roush, T. Mann, E. Mjolsness, R. S. Saunders, and E. Guiness, Lunar and Planetary Science Conference (poster), March 1999.

C14 "A Gene Network Model of Resource Allocation to Growth and Reproduction", G. Marnellos and E. Mjolsness, Artificial Life VI, eds. C. Adami, R. K. Belew, H. Kitano, and C. E. Taylor, MIT Press, 1998.

C13 "Probing the Dynamics of Cell Differentiation in a Model of Drosophila Neurogenesis", G. Marnellos and E. Mjolsness, Artificial Life VI, eds. C. Adami, R. K. Belew, H. Kitano, and C. E. Taylor, MIT Press, 1998.

C12 "A Gene Network Approach to Modeling Early Neurogenesis in Drosophila", G. Marnellos and E. Mjolsness, in Pacific Symposium on Biocomputing, eds. R. B. Altman, A. K. Dunker, L. Hunter and T. Klein, World Scientific, 1998.

C11 "A Convergence Proof for the Softassign Quadratic Assignment Algorithm", Anand Rangarajan, Alan Yuille, Steven Gold and Eric Mjolsness, Advances in Neural Information Processing Systems 9. M. Mozer, M. Jordan, and T. Petsche, eds. MIT Press, 1997.

C10 "A Multiscale Attentional Framework for Relaxation Neural Networks", Dimitris I. Tsioutsias and Eric Mjolsness, Advances in Neural Information Processing Systems 8, MIT Press, 1996.

C9 "New Algorithms for 2D and 3D Point Matching: Pose Estimation and Correspondence", Steven Gold, Chien- Ping Lu, Anand Rangarajan, Suguna Pappu and Eric Mjolsness. Advances in Neural Information Processing Systems 7, editors Tesauro, Touretzky, Leen, MIT Press 1995.

C8 "Learning with Preknowledge: Clustering with Point and Graph Matching Distance Measures", Steven Gold, Anand Rangarajan, and Eric Mjolsness. Advances in Neural Information Processing Systems 7, editors Tesauro, Touretzky, Leen, MIT Press, 1995.

C7 "Clustering with a Domain-Specific Distance Measure", Steven Gold, Anand Rangarajan, and Eric Mjolsness, Advances in Neural Information Processing Systems 6, editors Cowan, Tesauro, Alspector, Morgan-Kaufmann 1994.

C6 "Two-Dimensional Object Localization by Coarse-to-Fine Correlation Matching", Chien-Ping Lu and Eric Mjolsness, Advances in Neural Information Processing Systems 6, editors Cowan, Tesauro, Alspector, Morgan-Kaufmann 1994.

C5 "Animation of Plant Development", Przemyslaw Prusinkiewicz, Mark S. Hammel, and Eric Mjolsness, SIGGRAPH '93 Conference Proceedings, ACM 1993.

C4 "Visual Grammars and Their Neural Nets", Eric Mjolsness, Advances in Neural Information Processing Systems 4, editors Moody, Hanson and Lippmann, pp. 428-435, Morgan-Kaufman 1992.

C3 "A Lagrangian Approach to Fixed Points", Eric Mjolsness and Willard L. Miranker, Advances in Neural Information Processing Systems 3, editors Lippmann, Moody and Touretsky, Morgan-Kaufman 1991.

C2 "Connectionist Variable-Binding by Optimization", P. Anandan, Stanley Letovsky, and Eric Mjolsness. August 1989 Cognitive Science conference proceedings.

C1 "Neural Networks for Model Matching and Perceptual Organization", Eric Mjolsness, Gene Gindi, and P. Anandan. Advances in Neural Information Processing Systems 1, editor David S. Touretsky, Morgan- Kaufman 1989.

REFEREED CONFERENCES (more peripheral conferences)

PC18 "Calculating Derivative Displacement Fields from Confocal Fluorescence Microscopy Data" , Tigran Bacarian, Marcus Heisler, Eva-Maria Schoetz, and Eric Mjolsness. Workshop on Multiscale Biological Imaging, Data Mining and Informatics, Santa Barbara, Sept 7-8 2006.
http://www.bioimageinformatics.org/2006/proceedings/talks/bacarian_bioimageinformatics2006.pdf .

PC17 "Automatic Extraction of 3D Nuclear Bounding Surfaces from CLSM Imagery of Developing *Arabidopsis* Flowers", M.C. Burl, A.H.K. Roeder, C.K. Ohno, E.D. Mjolsness, E.M. Meyerowitz. Workshop on Multiscale Biological Imaging, Data Mining and Informatics, Santa Barbara, Sept 7-8 2006.
http://www.bioimageinformatics.org/2006/proceedings/talks/burl_bioimageinformatics2006.pdf

PC16 "Parameter Estimation for computational biological models through optimization", Li Zhang and Eric Mjolsness, International Conference on Bio-, Nano-, Informatics Fusion. October 10 2006. http://www.capitalbio.com/BNI&IFBT2006/program.htm .

PC15 "Model Fitting and Parameter Optimization for Biological Dynamical Pathway Systems", Li Zhang and Eric Mjolsness. International Conference on Bio-Nano-Informatics (BNI) Fusion, Marina del Rey. July 2005.

PC14 "Training of a crater detection algorithm for Mars crater imagery", Vinogradova T., Burl M., and Mjolsness E., IEEE Aerospace Conference, Big Sky MT, March 2002.

PC13 "Novel Analysis Methods for Biosignature Data", E. Mjolsness, T. Mann, R. Castaño, B. Wold, First NASANCI Workshop on Sensors for Bio-Signatures (talk), Pasadena June 1999.

PC12 "Connectionist Models of Cell Fate Patterning Involving Cell-Cell Communication", G. Marnellos and E. Mjolsness, First Annual In Silico Biology Conference (poster), Cambridge Healthtech Institute, San Francisco, June 1999.

PC11 "Use of Processing-In-Memory (PIM) Technology to Enable On-Site `Geologist's Assistant' " , Peter Kogge, Jay Brockman, Eric Mjolsness, Robert Ferraro, Paul Kapcio, Joseph Marshall, conference paper at the NASA Mars Micromission Workshop, Pasadena (Jeffrey Plescia, organizer), 1998.

PC10 "Automated Calibration of 2D Electrophoresis Images", Tom Brotherton, Alan Thompson and Eric Mjolsness, Annual Meeting of the Biomedical Engineering Society (poster), San Diego CA 1997.

PC9 "A Gene Network Model of Early Neurogenesis in Drosophila", G. Marnellos and E. Mjolsness, Proceedings of the Fourth Joint Symposium on Neural Computation, University of California San Diego and California Institute of Technology, vol. 7, page 142, 1997.

PC8 "Labelled Matching Problems and Imaging Models", Eric Mjolsness and Richard Calmbach, Proceedings of the Third Joint Symposium on Neural Computation, University of California San Diego and California Institute of Technology, page 231, June 1 1996.

PC7 "A Robust Point Matching Algorithm for Autoradiograph Alignment", Anand Rangarajan, Eric Mjolsness, Suguna Pappu, Lila Davachi, Patricia S. Goldman-Rakic, and James S. Duncan, Visualization in Biomedical Computing (VBC) '96, K. H. Hohne and R. Kikinis editors, pp. 277-286, Springer-Verlag, 1996.

PC6 "A Lagrangian Relaxation Network for Graph Matching", Anand Rangarajan and Eric Mjolsness, IEEE International Conference on Neural Networks (ICNN), vol 7, pp 4629-4634, IEEE Press 1994.

PC5 "Mean Field Point Matching by Vernier Network and by Generalized Hough Transform", Chien-Ping Lu and Eric Mjolsness, proceedings of the World Conference on Neural Networks, Portland OR July 1993.

PC4 "Visual Grammars and Their Neural Networks", proceedings of the SPIE conference on the Science of Artificial Neural Networks, Orlando, Florida, April 21

1992.

PC3 "A Neural Net for Reconstruction of Multiple Curves with a Visual Grammar", Eric Mjolsness, Anand Rangarajan, Charles Garrett, International Joint Conference on Neural Networks, Seattle, June 1991.

PC2 "Multiscale Optimization in Neural Nets: Preliminary Report", Eric Mjolsness, Charles Garrett, Willard L. Miranker, International Joint Conference on Neural Networks, San Diego, June 1990.

PC1 "A Preliminary Analysis of Recursively Generated Networks", Eric Mjolsness and David H. Sharp. In John Denker, editor, Neural Networks for Computing, American Institute for Physics, 1986. Proceedings. Snowbird, Utah.

SELECTED TECHNICAL REPORTS

R24 "Time-Ordered Product Expansions for Computational Stochastic Systems Biology", Eric Mjolsness, arXiv:1209.5231 [q-bio.QM] . Expansion of poster presentation at Q-Bio workshop 2012, Santa Fe.

R23 "Towards Measurable Types for Dynamical Process Modeling Languages", Eric Mjolsness. UCI ICS Technical Report #10-04.

R22 "On Cooperative Quasi-Equilibrium Models of Transcriptional Regulation", Static and Dynamic Models of Biological Networks", Eric Mjolsness, UCI ICS TR# 06-13. http://www.ics.uci.edu/~emj/ --> papers /TranscripReg.pdf. October 2006.

R21 "Stochastic Process Semantics for Dynamical Grammars", Eric Mjolsness, UCI ICS TR# 06-11. http://www.ics.uci.edu/~emj/ --> papers /AIMStochProcSemTR.pdf. September 2006.

R20 "Static and Dynamic Models of Biological Networks", Ashish Bhan and Eric Mjolsness, UCI ICS TR# 05-15. http://www.ics.uci.edu/~emj/--> papers / StatDynNetTR05.pdf. December 2005.

R19 "Stochastic Process Semantics for Dynamical Grammar Syntax", Eric Mjolsness. ICS TR# 05-14. http://www.ics.uci.edu/~emj/--> papers /StochProcSemanticsTR.pdf. November 2005. Summary version available as C46.

R18 "Variable-structure systems from graphs and grammars. Eric Mjolsness, UCI ICS TR# 05-09. http://www.ics.uci.edu/~emj/--> papers /vbl-Struct_GG_TR.pdf. July 2005.

R17 "Labeled graph notations for graphical models: Extended Report", Eric Mjolsness, UCI ICS TR# 04-03. http://www.ics.uci.edu/~emj/--> papers / graphNotationsTR.pdf . March 2004.

R16 "Multi-Parent Clustering Algorithms from Stochastic Grammar Data Models", E. Mjolsness, R. Castaño, A. Gray. Technical Report JPL-ICTR-99-5, 1999.

R15 "Clustering Methods for the Analysis of C. elegans Gene Expression Array Data", E. Mjolsness, R. Castaño, T. Mann, J. Roden, A. Gray, B. Wold, Technical Report JPL-ICTR-99-1, 1999.

R14 "Finding Globally Convergent Trajectories in Large-Scale Relaxation Neural Networks" Dimitris I. Tsioutias and Eric Mjolsness, UCSD Department of Computer Science Technical Report 97-563, 1997.

R13 "A Model of Optimal Resource Allocation to Growth and Reproduction Using Gene Networks", George Marnellos and Eric Mjolsness, UCSD Department of Computer Science December 1997.

R12 "Mean Field Point Matching by Vernier Network and by Generalized Hough Transform", Chien-Ping Lu and Eric Mjolsness, Report YALEU/DCS/TR-974, February 1993.

R11 "Mean Field Point Matching by Vernier Network and by Generalized Hough Transform: Preliminary Report", Chien-Ping Lu and Eric Mjolsness, Proceedings of the World Conference on Neural Networks, Portland Oregon, July 1993. Also Report YALEU/DCS/TR-949, February 1993.

R10 "Greedy Lagrangians for Neural Networks: Three Levels of Optimization in Relaxation Dynamics", Eric Mjolsness and Willard Miranker, Report YALEU/DCS/ TR-945, January 1993. Also IBM Research Division RC 18769 (82097), 3/9/93.

R9 "Automated Fingerprint Identification: An Independent Study", Eric Mjolsness and Carol Crawford, Report YALEU/DCS/TR-920, October 1991.

R8 "Bayesian Inference on Visual Grammars by Neural Nets that Optimize", Eric Mjolsness, Report YALEU/DCS/TR- 854, May 1991.

R7 "Neural Networks for Object Recognition with Compositional Hierarchies: Initial Experiments", Joachim Utans, Gene Gindi, Eric Mjolsness and P. Anandan. Yale EE Center for Systems Science Report No. 8903, February 1989.

R6 "Recursively Generated Neural Networks", Eric Mjolsness, David H. Sharp, and Bradley K. Alpert. Yale Computer Science Research Report YALEU/DCS/RR-549. Proceedings of the IEEE First Annual International Conference on Neural Networks, June 1987, p. III-165.

R5 "Control of Attention in Neural Networks", Eric Mjolsness, Proceedings of the IEEE First Annual International Conference on Neural Networks, June 1987, p. II-567.

R4 "A Preliminary Analysis of Recursively Generated Networks", Eric Mjolsness and David H. Sharp. Yale Computer Science Research Report YALEU/DCS/RR-476.

R3 "Neural Networks, Pattern Recognition, and Fingerprint Hallucination", Eric Mjolsness, Caltech Physics Ph.D. Thesis, 1985.

R2 SMP Handbook, C.A. Cole, S. Wolfram, G.C. Fox, J.M. Greif, E.D. Mjolsness, L.J. Romans, T. Shaw, and A.E. Terrano, California Institute of Technology 1981.

R1 "A Novel Approach to the Solution of Boundary Layer Problems", C.M. Bender, F. Cooper, G.S. Guralnick, E. Mjolsness, H.A. Rose, and D.H. Sharp, Los Alamos Preprint LA-UR-80-512 (1980).

OLDER TALKS AND PRESENTATIONS (since ~2004)

OTP 13.8 "Quantitative Symbolic Process Models: How a Fair Fraction of Intelligence Could be Abstracted in AI Research", poster presentation corresponding to refereed extended abstract C79, AAAI Fall Symposium on "How Should Intelligence be Abstracted in AI Research", November 15-16, Washington DC 2013.

OTP 13.7 "Progress in computer algebra based biological modeling languages", oral presentation, Wolfram Technology Conference, Urbana-Champaign IL, 21 October 2013.

OTP 13.6 "Computable Abstractions for Plant Modeling", Sainsbury Laboratory Computational Workshop, Sainsbury Laboratory Cambridge University (SLCU), Cambridge UK, August 30 2013.

OTP 13.5 "Problems of Type Theory and Regularization for Morphodynamics", abstract and poster presentation, The Seventh Annual q-bio Conference on Cellular Information Processing (Q-Bio), August 8 2013. (Poster version of abstract in C78.)

OTP 13.4 "Stochastic Modeling Languages and Parameter Inference", ID Analytics lunchtime seminar, San Diego CA, May 8 2013.

OTP 13.3 "Systematic Biological Modeling, Model Reduction, and prospects for Complexity-Related Understanding", Santa Fe Institute, Santa Fe NM, April 18 2013.

OTP 13.2 "Quasi-Equilibrium and Non-Equilibrium Modeling of Biochemical Reaction Networks", National Short Course on Systems Biology, UCI, January 24 2013.

OTP 13.1 "Cellerator Simulation Software", National Short Course on Systems Biology, UCI, January 15 2013.

OTP 12.12 "Topological Object Types for Morphological Modeling Languages", IEEE Fourth International Symposium on Plant Growth Modeling, Simulation, Visualization and Applications 2012 (PMA-12), Shanghai China, November 2 2012.

OTP 12.11 "Applying Methods from Theoretical Physics to Computational Biology", Zurich Theoretical Physics Colloquium, September 24 2012.

OTP 12.10 "New Bio-Modeling Methods", Sainsbury Laboratory Computational Workshop, Sainsbury Laboratory Cambridge University (SLCU), Cambridge UK, August 30 2012.

OTP 12.9 "New Methods for Modeling Stochastic Biochemical Networks", LANL CNLS Talk (Center for Non-Linear Studies, Los Alamos National Laboratory), Los Alamos NM July 31 2012.

OTP 12.8 "Time-ordered Products for Stochastic Systems Biology", abstract and poster presentation, The Sixth Annual q-bio Conference on Cellular Information Processing (Q-Bio), August 10 2012.

OTP 12.7 "Multiscale Simulation Algorithms", Sixth Q-Bio Summer School, Santa Fe NM, July 24 2012.

OTP 12.6 "Computational Morphodynamics", LANL CNLS Colloqium (Center for Non-Linear Studies, Los Alamos National Laboratory), Los Alamos NM July 23 2012.

OTP 12.5 "Mathematical Modeling Ideas for Morphodynamics", Bioinformatics of Genome Regulation and Structure (BGRS) Novosibirsk, Russia, June 29 2012.

OTP 12.4 "Quasi-equilibrium and nonequilibrium modeling of biochemical reaction networks", Young Scientists' School, Bioinformatics of Genome Regulation and Structure (BGRS) Novosibirsk, Russia, June 28 2012.

OTP 12.3 "Alan Turing's Influence on Computational Biology", Computer Science and Information Technology Conference (CTSA, for high school teachers), UCI, July 9 2012.

OTP 12.2 "Stochastic and Spatial Models: Gene Regulation Networks, Causal and Statistical", National Short Course on Systems Biology, UCI, January 17 2012.

OTP 12.1 "Cellerator Simulation Software", National Short Course on Systems Biology, UCI, January 16 2012.

OTP 11.4 "Geometrical Ideas for Plant Morphodynamics", Sainsbury Laboratory Computational Workshop, Sainsbury Laboratory Cambridge University (SLCU), Cambridge UK, September 14 2011.

OTP11.3 "Topological Object Types for Morphodynamic Modeling Languages", Eric Mjolsness and Alexandre Cunha, Mathematical Foundations of Programming Language Semantics (MFPS) 27, Thursday May 26, 2011.

OTP 11.2 "Visual and Dynamical Grammars", Perona research group, California Institute of Technology, February 3 2011. Also (different version) Prusinkiewicz research group, University of Calgary, March 21 2011.

OTP 11.1 "Computational Morphodynamics", Annenberg Center for Information Science and Technology", California Institute of Technology, January 11, 2011. Also Fraser research group, Caltech, November 8 2010.

OTP 10.6 "Mathematical Modeling Languages for Plant Morphodynamics", Freiburg Institute for Advanced Study (FRIAS), Plant Systems Biology Workshop, Sept 5 2010.

OTP 10.5 "Foundations for Lively Geometry in Plant Morphodynamics", Chemical Genetics IGERT Seminar, Institute for Integrative Genome Biology, University of California, Riverside, June 11 2010.

OTP 10.4 "Mathematical Foundations for Morphodynamics
in Biological Modeling", 26th Conference on Mathematical Foundations of Programming Semantics (MFPS 2010), Ottowa, May 8, 2010.

OTP 10.3 "Mathematics of small stochastic reaction networks: Eigenvalue analysis and model reduction", Eric Mjolsness, Upendra Prasad, Todd Johnson. Poster presented at Frontiers in Mathematical Biology, NSF-NIH PIs Meeting 2010, April 26-27, 2010.

OTP 10.2 "Gene Regulation Network Models: from Causal to Statistical and Back", Dept. of Biostatistics Seminar, School of Public Health, University of California, Los Angeles. April 21, 2010.

OTP 10.1 "Mathematical foundations for morphodynamics in biology", Invited discussant, Workshop on Pattern Formation in Morphogenesis, Institut des Hautes Études Scientfiques (IHES), Bures-sur-Yvette, France January 14, 2010.

OTP 09.5 "Foundations for Lively Geometry in Plant Morphodynamics", Invited keynote talk, Systems Biology/Modeling in Plants Symposium, International Plant Molecular Biology Congress (IPMB), St. Louis, October 26 2009.

OTP 09.4 "Morphodynamics: Scoping the Field", Kavli Institute for Theoretical Physics, Blackboard Lunch, 31 August 2009.

OTP 09.3 "Plant image analysis for developmental modeling", invited talk, Janelia Farm workshop on Bioimage Informatics, April 2009.

OTP 09.2 "Problems of modeling in growing plant tissues", invited talk, AGROPOLIS 2009 seminar on Modelling in Plant Biology: Models at the cellular and tissue scales, March 6 2009.

OTP09.1 "Computable Plants and Morphodynamics", UCI Department of Ecology and Evolution, Physiology group seminar, February 2009.

OTP08.11 "Computational Introduction to Morphodynamics", iPlant Grand Challenge Workshop on Computational Morphodynamics, Biosphere 2 December 16, 2008.

OTP08.10, "Physical Modeling in Biology: Gene Regulation to Plant Development", Physics Colloquium, Washington University in St. Louis, September 17 2008.

OTP 08.9, "Computable Plants and Morphodynamics", Computer Science Department Seminar, University of Missouri, September 16 2008.

OTP08.8, "Mathematical Methods for Systems Biology", tutorial, The Second q-bio Conference on Cellular Information Processing, Santa Fe NM August 2008.

OTP08.7 "Semantics and Dynamics: An algebra of stochastic processes as the formal semantics for a biological modeling language". Invited talk at the 24th conference on Mathematical Foundations of Programming Semantics, Philadelphia Pennsylvania, May 24 2008.

OTP08.6, "Computational Morphodynamics", Computational Morphodynamics Workshop, Beckman Network Modeling Center (BNMC), Caltech, May 21 2008.

http://computational-morphodynamics.net/workshop-2008/index.html .

OTP08.5, "Prospects for Computational Morphodynamics", invited talk, CPIB Workshop on Auxin Transport, Center for Plant Integrative Biology, Nottingham, May 16 2008.

OTP08.4, "Cellerator, Sigmoid, Cellzilla, and Plenum", invited talk, CPIB Workshop on Auxin Transport, Center for Plant Integrative Biology, Nottingham, May 15 2008.

OTP08.3, "Opportunities and challenges in cyberinfrastrucure development", invited talk, iPlant kickoff meeting, Cold Spring Harbor, April 8 2008.

OTP08.2, "Computational Frameworks for Developmental Biology", invited talk, UCI Developmental Biology Center retreat, March 17, 2008.

OTP08.1, "Computational Frameworks for Phyllotaxis and Morphodynamics", invited talk, Workshop on Morphogenesis, Kavli Institute for Theoretical Physics, March 3, 2008.

OTP07.8, "New Mathematical Methods for Systems Biology", Tutorial, International Society for Systems Biology (ICSB 2007), Long Beach California, 2:00 - 5:00 PM, Monday October 1, 2007.

OTP07.7 "A Random Steady State model for the activity of Pyruvate Dehydrogenase", invited talk, System Biology for Microbes at the 6th Annual International Conference on Computational Systems Bioinformatics (CSB 2007), Life Science Society, San Diego, August 2007.

OTP07.6 "Computational Support for Theory in Science", invited discussion provocation, Caltech e-Science and Cyberinfrastructure Workshop, June 13, 2007.

OTP07.5 "Variable-Structure Dynamical Systems: Recent Work", invited talk, ETH Zürich, April 18, 2007.

OTP07.4 "Progress and Techniques from the Computable Plant Project", invited talk, Center for Plant Integrative Biology, Nottingham University Sutton Bonington Campus, UK April 5, 2007.

OTP07.3 "Model Reduction for Parameter Estimation", invited talk, Parameter Estimation In Systems Biology (PESB), Pascal Workshop, Manchester, UK March 28, 2007. http://www.cs.manchester.ac.uk/ai/pesb07/ .

OTP 07.2 "An algebra of stochastic processes as the formal semantics for a biological modeling language", invited talk, University of Edinburgh, March 20 2007.

OTP 07.1 "Mathematical models of likely mechanisms for phyllotaxis: Polarized auxin transport, cell growth, and dynamic connectivity", invited talk, SIAM Minisymposium on Phyllotaxis, Joint Mathematics Meetings, New Orleans Louisiana January 5 2007.

OTP06.23 "Formulating inference problems for variable-structure dynamical Systems", invited talk, Neural Information Processing Systems (NIPS) 2006 Workshop: Revealing Hidden Elements of Dynamical Systems, December 8 2006. Vancouver, Canada. http://www.haifa.il.ibm.com/Workshops/nips2006/ .

OTP06.22 "Biochemical Network Models with Really Big Matrices", invited talk, Caltech Biological Network Modeling Center (BNMC). Thursday, November 30, 2006. http://bnmc.caltech.edu/Events/mjolsness-2006-11-30 .

OTP06.21 "Physical Methods for Modeling Biological Development", invited seminar, Kavli Institute for Theoretical Physics, Santa Barbara. November 14, 2006. http://online.kitp.ucsb.edu/online/bio99/mjolsness/ .

OTP06.20 "Integrative mathematical modeling frameworks for plant development", invited talk, Banbury Center Conference on Integration of Hormonal and Genetic Regulation in Plant Development, Cold Spring Harbor Laboratories. November 8 2006.

OTP06.19 Building multiscale mathematical models of development in Arabidopsis and Drosophila", invited talk, Department of Systems Biology, Harvard Medical School. November 3 2006. http://vcp.med.harvard.edu/abstracts/mjolsness.html .

OTP06.18 "Structured and dynamic collections: SBML Level 3 support?", The Eleventh Workshop on Software Platforms for Systems Biology, Tokyo Japan October 13 2006.
http://www.sbml.org/workshops/eleventh/presentations/mjolsness/Mjolsness-arrays.pdf

OTP06.17 "Developmental modeling in SBML", The Eleventh Workshop on Software Platforms for Systems Biology, Tokyo Japan October 12 2006.
http://www.sbml.org/workshops/eleventh/presentations/mjolsness/Mjolsness-Developmental.pdf .

OTP06.16 "New Mathematical Methods for Systems Biology", Tutorial (3 hours, 40 attendees), International Conference on Systems Biology, Yokohama Japan October 8 2006. http://www.icsb-2006.org/tutorials/tutorials.htm .

OTP06.15 "Modeling Molecular Complexes in Networks", IGB Synthetic Biology Symposium, September 15 2006. http://www.igb.uci.edu/specialevent06/index.html .

OTP06.14 "The Computable Plant: How Differential Gene Expression Leads to Pattern Formation in Plants", Computable Plant workshop for high school science teachers, Huntington Botanical Gardens teaching resource center, August 9 2006.

OTP06.13 "Modeling transcriptional regulation with equilibrium molecular complex composition", 5th International Conference on the Bioinformatics of Genome Regulation and Function (BGRS-2006), Novisobirsk Russia, July 20 2006.

OTP06.12 "Computational modeling and image analysis approaches to understanding the dynamics of the *Arabidopsis thaliana* shoot apical meristem" St. Petersburg Polytechnic University, St. Petersburg Russia, July 12 2006.

OTP06.11 "Towards a searchable space of dynamical systems models", NKS 2006 Wolfram Science Conference, Washington DC, June 15 2006. http://wolframscience.typepad.com/wolfram_science/2006/06/eric_mjolsness_.html

OTP06.10 "The Computable Plant: An Experimental and Computational Framework for Developmental Modeling in Plants", Principal Investigators' meeting, Frontiers in Biological Research Program, National Science Foundation Headquarters, June 1 2006.

OTP06.9 "Physical methods for modeling biological systems", Physics and Astronomy Department Colloquium, California State University Los Angeles. April 30, 2006.

OTP06.8 "Towards A Modeling Language for Scientific Computing and Inference", CS Department Seminar, UC Irvine, April 14, 2006.

OTP06.7 "New Perspectives in Stochastic Dynamics and Simulations", Caltech Biological Network Modeling Center, Biological Image Analysis workshop. March 22, 2006. http://bnmc.caltech.edu/Events/bnmc-stochastics-meeting .

OTP06.6 "Physical methods for modeling biological systems", Physics Research Conference, Caltech Department of Physics. March 9, 2006.

OTP06.5 "Computational modeling and image analysis approaches to understanding the dynamics of the *Arabidopsis thaliana* shoot apical meristem", Salk Institute, February 17, 2006.

OTP06.4 "New Tropisms for the Computable Plant". Third annual research meeting,

Computable Plant project, Kerckhoff Marine Laboratory, Corona del Mar CA. February 11, 2006.

OTP06.3 "Scientific Inference Systems Laboratory: An Overview", Caltech Center for Advanced Computing Research, February 9, 2006.

OTP06.2 "Image Understanding for Biological Research", Caltech Biological Network Modeling Center, Biological Image Analysis workshop. Joint with Tigran Bacarian. February 2, 2006. http://bnmc.caltech.edu/Events/bnmc-imaging-meeting .

OTP06.1 "Stochastic Process Semantics for Dynamical Grammar Syntax: An Overview", Ninth International Symposium on Artificial Intelligence and Mathematics, Ft. Lauderdale, January 2006.

OTP05.13 "Computational modeling for plant growth and development", University of Nebraska, Lincoln distance education seminar series "Plant organization and crop simulation modeling: Integrating interdisciplinary perspectives", invited by Albert Weiss, P. Stephen Baenziger and D. Namuth. Narration-recorded slides online November 2005.

OTP05.12 "Quantitative analyses of biological data – a view from mathematics", NSF Plant Science Cyberinfrastructure Workshop, NSF HQ, Washington DC October 17-18 2005.

OTP05.11 "Computer algebra support for biological modeling", Wolfram Technology Conference, Urbana-Champaign Illinois October 6 2005.

OTP05.10 "Computational modeling and image processing approaches to understanding the dynamics of the Arabidopsis thaliana shoot apical meristem", E. Mjolsness, T. Bacarian, P. Baldi, V. Gor, M. Heisler, H. Jönsson, V. Reddy, A. Sadovsky, B. Shapiro, E. Meyerowitz. Symposium "Modeling plant development: From genes to phenotypes", in International Botanical Congress, Vienna 2005.

OTP05.9 "The *Sigmoid* Biological Pathway Modeling System". The Seventh Annual BioPathways Meeting, Special Interest Group at the Intelligent Systems in Molecular Biology conference, Detroit, June 24, 2005.

OTP05.8 "Physics-inspired models of regulatory networks for cellular and developmental biology". Invited seminar Center for Theoretical Biological Physics (CTBP) in San Diego, a joint effort between research groups at UCSD, the Salk Institute, the Scripps Research Institute and the San Diego Supercomputer Center. http://ctbp.ucsd.edu/seminars.html . May 20, 2005.

OTP05.7 "Image understanding and modeling for biological development: the case of a plant shoot meristem", Eighth Workshop on Mining Scientific and Engineering

Datasets, in conjunction with the Fifth SIAM International Conference on Data Mining (SDM 2005), http://www-aig. jpl.nasa.gov /public/MSD05/. Newport Beach, CA. Saturday. Invited keynote. Apr 23, 2005.

OTP05.6 "Variable-structure systems from dependency diagrams and dynamical

grammars" E. Mjolsness. The Learning Workshop, http://snowbird.djvuzone.org/ . Snowbird, Utah, April 5-8 2005.

OTP05.5 "Modeling and image understanding for biological development: the case of a plant shoot meristem", Eric Mjolsness. Computer Modeling in Biology group, Cambridge University, http://www.anat. cam.ac. uk/~comp-cell/CMBGroup / previous.htm. March 29 2005.

OTP05.4 "Some Mathematical Problems in Computational Systems Biology", Eric Mjolsness. UC Irvine Applied Mathematics seminar. Invited talk. March 14, 2005.

OTP05.3 "Biology and Modeling in the Computable Plant Project", Eric Mjolsness. Caltech Beckman Institute proposal review. March 10, 2005.

OTP05.2 "Variable-Structure Probabilistic Models", Eric Mjolsness, IPAM workshop on "Probabilistic Models of Cognition: The Mathematics of Mind", http://www. ipam. ucla.edu /programs/cog2005/. A. Yuille and J. Tenenbaum, organizers. Invited talk. January 2005.

OTP05.1 "Measuring and modeling the growth of a plant shoot apical meristem", Eric Mjolsness. Dynamics Days, 24th Annual International Conference. http://www. physics. uci. edu/dynamicsdays2005/. Long Beach CA, January 8, 2005.

OTP04.5 "The Computable Plant: Software and Science", Eric Mjolsness, dual poster presentation at the Caltech Biology Division Annual Retreat, Redondo Beach CA, October 16 2004.

OTP04.4 "Scientific Applications of Image Pattern Recognition", invited presentation at the Round-Table on Scientific Imaging, Institute for Cytology and Genetics, Novosibirsk, Russia July 27 2004.

OTP04.3 "The Computable Plant: A Software Architecture for Developmental Modeling in Plants" by Victoria Gor, Bruce Shapiro, H. Jönsson, M. Heisler, GV.Reddy, E Meyerowitz and Eric Mjolsness. Fourth International Conference on Bioinformatics of Genome Regulation and Structure. http://www.bionet. nsc.ru/ meeting/ bgrs2004/ . July 2004.

OTP04.2 "Network Dynamics for Systems Biology", Eric Mjolsness. International Conference on Complex Systems, Boston MA. http://necsi.org/ events/iccs/ iccscover.html . May 2004.

OTP04.1 Mjolsness E, Shapiro B, Heisler V., and Meyerowitz EM. The Computable Plant: A Software Architecture for Developmental Modeling in Plants. Poster presentation at Pacific Symposium for Biocomputing, Kona Coast, Hawaii, January 2004.