

# Curriculum Vitae

Bhubaneswar Mishra

*Professor of Computer Science, Engineering, Mathematics, and Cell Biology*

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## Personal

Nationality Indian National & American Citizen

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## Scholastic Record

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|------|----------------|---|
| 1985 | Ph.D.          | Carnegie-Mellon University, (Computer Science)<br><b>Some Graph Theoretic Issues in VLSI Design,</b><br>Thesis Committee: <i>Prof. E.M. Clarke</i> (advisor),<br><i>Profs. R. Kannan, R. Statman and R.E. Tarjan.</i> |
| 1982 | M.S.           | Carnegie-Mellon University, (Computer Science)<br>Area Committee: <i>Prof. E.M. Clarke</i> (advisor),<br><i>Profs. D. Siewiorek and Wm. A. Wulf.</i>  |
| 1980 | B.Tech.(Hons.) | Indian Institute of Technology, Kharagpur, India,<br>(Electronics and Electrical Communication Engg.)<br>Advisor: <i>Prof. S.C. DeSarkar.</i>   |
| 1975 | I.Sc.(Hons.)   | Utkal University, Bhubaneswar, India.   |
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## Honors and Achievements

### Acedemy Members/Fellows

(December 2017:) *National Academy of Inventors Fellow*.

### Society Fellows

(December 2010:) *AAAS Fellow*. (For contributions to engineering sciences.)

(January 2009:) *IEEE Fellow*. (For contributions to mathematical models of robotic grasping.)

(June 2008:) *ACM Fellow*. (For contributions to symbolic computation and computational biology.)

### Distinguished Professor, Scientist, Alumnus, etc.

(May 2011:) *Distinguished Alumnus Award (2011)*, Indian Institute of Technology (Kharagpur), India.

(January 2009:) *Invited Guest*, Kavli Future Symposium: Envisioning the Extreme Machine, Muelle, Costa Rica.

(January 2003) *NYSTAR Distinguished Professor of 2001*, New York State Office of Science, Technology & Academic Research, Albany, NY.

(October 2003) *Distinguished Biotechnologists, Cutting Edge Science in New York City*, New York Academy of Sciences, NY.

### Distinguished/Plenary Lecture, etc.

(May 2017:) *Panelist on AI and Health*, TECHONOMY, New York, NY.

(September 2016:) *Keynote Speaker*, Mathematical Bioscience Institute, Columbus, Ohio.

(September 2016:) *Keynote Speaker*, CIBB 2016, Edinburgh, Scotland.

(February 2015:) *Keynote Speaker*, ICDCIT 2015, KiiT, Bhubaneswar, Odisha, India.

(April 2014:) *Distinguished Lecturer*, College of Engineering and Computer Science, University of Central Florida, Orlando, Florida.

(February 2014:) *Keynote Speaker*, ICDCIT 2015, KiiT, Bhubaneswar, Odisha, India.

(Feb 2012:) *Mathematical Keynote Speaker*, IMA Summit Workshop, Marshall House, Savannah, GA.

(July 2011:) *Keynote Speaker*, 9th International Workshop on Satisfiability Modulo Theories (SMT-CAV 2011), Snow Bird, Utah.

(July 2011:) *Invited Guest Speaker*, Lipari School on Computational Complex Systems – Jacob T. Schwartz International School for Scientific Research, Lipari, Italy.

(July 2011:) *Invited Lecturer*, Lipari School on BioInformatics and Computational Biology – Jacob T. Schwartz International School for Scientific Research, Lipari, Italy.

(June 2011:) *Keynote Speaker*, Eighth Annual Meeting of the Bioinformatics Italian Society (BITS 2011), Pisa, Italy.

- (February 2011:) *Keynote Speaker*, Bhabha Centenary Conference, Tata Institute of Fundamental Research, Mumbai, India.
- (January 2011:) *Keynote Speaker*, Supercomputing: The Imperative and the Path Forward, Abu Dhabi, UAE.
- (November 2010:) *Distinguished Lecturer*, Distinguished Lecture Series, College of Engineering and Computer Science, University of Central Florida, Orlando, Florida.
- (September 2010) *Invited Lecturer*, Sixth International School on Biology, Computation and Information (BCI 2010), Dobbiaco (BZ), Italy Lipari, Italy.
- (September 2008:) *Distinguished Lecturer*, Distinguished Lecture Series, Iowa State University, Ames, Iowa.
- (July 2008) *Invited Lecturer*, The International Summer School of Functional Genomics, Baia Samuele Conference Centre, Scicli-Sicily, Italy, July 5th-19th 2008.
- (July 2007:) *Keynote Speaker*, *Algebraic Biology 2007*, RISC, Castle of Hagenberg, Austria.
- (May 2007:) *Invited Speaker*, *Interface 2007*, 39th Symposium on the interface of statistics, computing science, and applications, Philadelphia, PA.
- (March 2007:) *Invited Speaker*, Applications of Algebraic Geometry at the Institute for Mathematics and its Applications (IMA), Minneapolis, MN.
- (December 2006:) *Keynote Speaker*, 9th International Conference on Information Technology (CIT 2006), Bhubaneswar, Orissa, India.
- (September 2006:) *Distinguished Lecturer*, Distinguished Lecture Series, Department of Computer Science, Dwight Look College of Engineering, Texas A&M University, College Station, TX.
- (July 2006) *Invited Lecturer*, The International School of Advanced BioMedicine and BioInformatics and The Lipari International School for Computer Science Researchers, Lipari, Italy.
- (September 2005:) *Keynote Speaker*, 8<sup>th</sup> Intl. Meeting of the Microarray Gene Expression Data Society, MGED8, Bergen Norway.
- (July 2005:) *Keynote Speaker*, 17<sup>th</sup> Int. Conference on Computer Aided Verification, CAV '05, Edinburgh, Scotland.
- (June 2005:) *Invited Plenary Speaker*, Detecting and Processing Regularities in High Throughput Biological Data, DIMACS, Rutgers University, New Jersey.
- (November 2004) *Distinguished Speaker*, Distinguished Lecture Series, Institute for Systems Research, University of Maryland, College Park. MA.
- (October 2004) *Distinguished Lecturer*, Distinguished Seminar Series, Drexel University, Philadelphia, PA.
- (May 2004) *Plenary Speaker*, International Conference on Complex Systems, NECSI, Boston, MA.
- (April 2004) *ECE/CS Distinguished Lecturer*, ECE/CS Distinguished Lecture, Carnegie-Mellon University, Pittsburgh, PA.
- (December 2003) *Keynote Speaker*, Conference On High Performance Computing, HiPC 2003, Hyderabad, India.

- (November 2003) *Distinguished Speaker at Delaware*, Computer Science Department, University of Delaware, Newark, DE.
- (October 2003) *Distinguished Lecturer At Rutgers*, Electrical & Computer Engineering, Rutgers University New Brunswick, NJ.
- (October 2002) *2002-2003 Columbia Distinguished Lectures in Computer Science*, Columbia University, New York, NY.
- (May 2000) *Distinguished Lecturer*, Distinguished Computer Scientists Symposium, *Frontiers of Research in the New York Area*, New York Academy of Sciences, NY.
- (June 1999) *Invited Lecturer*, 11th International School in Computer Science: *Computational Biology*, Lipari, Italy.
- (February 1997) *The Gaschnig/Oakley Memorial Lecture*, Distinguished Lecturer, School of Computer Science, Carnegie-Mellon Univ., Pittsburgh, PA.

### Academic Awards

- (July 1980) Second Position (over all grade points), Department of Electronics and Electrical Communication Engineering, Indian Institute of Technology, Kharagpur.
- (February 1980) First Prize, Eleventh All India Design Competition for Engineering Students, Electronics & Telecommunication Engineering, (National Research Development Corporation Award), 1979.
- (June 1975) First in the state-wide I.Sc. Exam. Senior College Merit Scholarship, Utkal University.

### Others: *Invited addressee:*

- Invited Session, International Conference On High Performance Computing, Bangalore, India;
- Biological Language Modeling Workshop, School of Computer Science, Carnegie-Mellon University, Pittsburgh, PA;
- SIAM Symposium on Computational Models and Simulation for Intra-Celul Bioinformatics Program Seminar, Boston University, Boston, MA, May 20, 2004.
- lar Processes, Washington, DC;
- International Conference on Complex Systems (ICCS2002), Nashua, NH;
- 1st Geometry Workshop, Brooklyn Polytechnic, Brooklyn, New York;
- Annual SIAM Meeting, San Diego, CA;
- ABRF 2001, San Diego, Ca;
- IPAM (Institute for Pure and Applied Mathematics), UCLA, LA;
- New York Academy of Science, Manhattan, NY;
- NECSI (New England Complex Systems Institute), NH;
- AMS Meeting, Charlotte, NC;
- DIMACS Workshop on Robotics and Computer Vision, DIMACS, Rutgers University, NJ;
- Workshop on Grasping, Fixturing, and Manipulation: Towards a Common Language, ICRA 98, Leuven, Belgium;
- Workshop on Lie Groups and Lie algebra for Robotics, ICRA 98, Leuven, Belgium;
- 1998 CSHL Genome Mapping, Sequencing & Biology Conference, Cold Spring Harbor, NY;
- 2nd Research Conference on Computational Biology, RECOMB 98, New York, NY;
- 9th International Genome Sequencing and Analysis Conference, Hilton Head, SC;
- World Automation Congress, WAC'96. Montpellier, France;
- The Second European Workshop on Real-time and Hybrid systems. Grenoble, France;
- Workshop MEDICIS-SMF of Differential Algebra, Marseilles, France;
- Workshop on the Algorithmic Foundations of Robotics (WAFR'94), San Francisco;
- 1994 NSF Design and Manufacturing Conference, M.I.T.;
- 4th Int'l conf. on CIM and Automation Technology, RPI;
- NSF Workshop on Manufacturing and Computational Geometry, New York;
- SIAM Mini symposium on Robotics, San Diego, CA.
- POSSO (POlynomial System SOLving) Workshop, Sophia-Antipolis & Nice, France;
- Workshop on Geometric Algorithms for Manufacturing, International Conference on Robotics and Automation: (ICRA 93), Atlanta;
- NSF Workshop on Geometric Uncertainty in Motion Planning, Catalina

Island; • IROS'91: The 1991 IEEE International Workshop on Intelligent Robots and Systems, Osaka, Japan; • Robotics and Mathematics session of AAAS-91, Washington, DC; • 2nd International Workshop on Advances in Robot Kinematics, Research Institute for Symbolic Computation (RISC), Linz, Austria; and • DIMACS workshop on Real Geometry and Applications, Discrete Mathematics and Computer Science Rutgers University, NJ.

*Honors:*

- Elected Senior Member, IEEE; • Elected Member,  $\Sigma \Xi$ , The Scientific Research Society.

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## Employment

Sept. 2016–present	<b>Director, Bioinformatics Engineering.</b> Tandon School of Engineering, New York University.
Sept. 2015–present	<b>Professor of Electrical and Computer Engineering.</b> Tandon School of Engineering, New York University.
Sept. 2004–present	<b>Professor of Cell Biology.</b> School of Medicine, New York University.
Apr. 1999–present	<b>Professor of Computer Science and Mathematics.</b> Courant Institute of Mathematical Sciences, New York University.
Sept. 2001–Aug. 2004	<b>Professor.</b> Cold Spring Harbor Laboratory.
Jan. 2001–Aug. 2004	<b>Co-director.</b> Center for Comparative Functional Genomics, New York University.
Jan. 1995–Mar. 1999	<b>Professor of Computer Science.</b> Courant Institute of Mathematical Sciences, New York University.
Sep. 1994–Sep. 1996	<b>Deputy Chair.</b> Computer Science, Courant Institute of Mathematical Sciences, New York University.
Sep. 1991–Jan. 1995	<b>Associate Professor Computer Science.</b> Courant Institute of Mathematical Sciences, New York University.
Sep. 1985–Sep. 1991	<b>Assistant Professor of Computer Science.</b> Courant Institute of Mathematical Sciences, New York University.

## Other Academic Employment

2008–Present	<b>Visting Scholar.</b> Quantitative Biology Center, Cold Spring Harbor Laboratory, Long Island, New York.
2000–Present	<b>Adjunct Professor, Department of Human Genetics.</b> Mt. Sinai School of Medicine, NY.
2014–Present	<b>Director, Como Summer School on Cancer, Evolution and Complexity.</b> Univ. Milano, Como, Italy.
2016–Present	<b>Mentor NYU/ffVC AI NexusLab.</b> Tandon School of Engineering, NYU.
2015–Present	<b>Advisory Board,</b> NYU-ePoly Online Graduate Program NYU Polytechnic School of Engineering, Brooklyn, New York.
2007–Present	<b>Advisory Board</b> (Biotech/Medical, Information Science & Nanotechnology). Lifeboat Foundation. ( <a href="http://www.lifeboat.com">www.lifeboat.com</a> )
2007–Present	<b>Scientific Advisory Board.</b> Istituto di Genomica Applicata (IGA), Udine, Italy.
Summer of 2016	<b>Advisor, Wigler Lab</b> (Cold Spring Harbor Laboratory). Long Island, NY.
2007–2014	<b>External Scientific Advisory Board.</b> Arizona Cancer Center (AZCC), P01 (Targets to Therapeutics in Pancreatic Cancer). Phoenix, AZ.
2007–2012	<b>Advisory Board</b> (VisANT, Boston University). Boston, MA. ( <a href="http://visant.bu.edu">visant.bu.edu</a> )
2004–2007	<b>Scientific Advisory Board.</b> Center for Biological Language Modeling, CMU, MIT, U. Pitt, NRC (Canada), Mathworks, & Medstory. Pittsburgh, PA.
2003–2006	<b>Adjunct Professor.</b> Tata Institute of Fundamental Research, Colaba, Mumbai, India.
2004–2005	<b>Member of the Steering Committee.</b> International School on Biomedicine and Bioinformatics, Lipari, Italy
1999–2003	<b>Professor (Courtesy).</b> Taub Urban Research Center, Wagner School of Public Policy, NYU.
Summer of 2002	<b>Visiting Professor.</b> Università degli Studi di Udine, Udine, Italy.
2000–2001	<b>Adjunct Professor of Bioinformatics.</b> Cold Spring Harbor Laboratory.
October–November, 1999	<b>Visiting Professor.</b> Tata Institute of Fundamental Research, Colaba, Mumbai, India.
Summer of 1999	<b>Visiting Professor.</b> Università di Catania, Catania, Sicily.
Summer of 1996	<b>Visiting Professor.</b> Università Degli Studi di Milano, Milan, Italy and Consorzio Milano Ricerche, Milan, Italy.
Summer of 1991	<b>Visiting Professor.</b> Università di Catania, Catania, Sicily.
Oct. 1989–Sep. 1990	<b>Joint-Study Researcher.</b> International Business Machine, York Town Heights, New York.
Summer of 1981	<b>Researcher.</b> Mobile Robots Lab, Robotics Institute, CMU, Pittsburgh. .
Sep. 1980–Sep. 1985	<b>Research Assistant.</b> Carnegie-Mellon University, Dept. of Computer Science.

## Non-Academic Employment

February 2017–Present	<b>Technical Advisor/Mentor.</b> [ <i>HealthCare Data Science and AI</i> ] Behold.ai, New York.
Sep 2015–Present	<b>Data Science Advisor.</b> [ <i>Ad Attribution</i> ] brainiad, LLC, New York.
June 2014–Present	<b>Advisor.</b> [ <i>Preventive Medicine; Aging &amp; Age-Related Diseases</i> ] In Silico Medicine, LLC, Maryland.
May 2014–Present	<b>Data Science Advisor.</b> [ <i>Advertising and Marketing</i> ] Genesis Media, LLC, NY.
December 2013–Present	<b>Advisor.</b> [ <i>Data Science in Finance</i> ] Instadat, LLC, NY.
April. 2012–Present	<b>Founder &amp; Advisor.</b> [ <i>Biotech</i> ] MR Technology, LLC, CA.
Jan. 2008–Present	<b>Co-Founder &amp; Member, S.A.B..</b> [ <i>Nanotech</i> ] Molecular Morse Code: MMC, LLC, CA.
Jan. 2001–Present	<b>Founder &amp; Member, S.A.B..</b> [ <i>Biotech</i> ] OpGen, Wisconsin. (Formerly: eDNA Genomics).
June. 2001–Present	<b>Member, Advisory Board.</b> [ <i>Internet</i> ] Mindfire Solutions: mindfiresolutions.com, New Delhi, India.
Jan 2016 – Dec 2016	<b>Advisor, Business Acceleration Board.</b> [ <i>Artificial Intelligence</i> ] Pypestream, LLC, CA.
April. 2012– August 2016	<b>Founder &amp; Advisor.</b> [ <i>Healthcare</i> ] Seqster, LLC, CA.
Oct. 2008–Aug. 2011	<b>Consultant.</b> [ <i>Pharmacogenomics and Personalized Medicine</i> ] Abraxis Bioscience, Inc.
Mar. 2006–Apr. 2008	<b>Member, Board of Advisors.</b> [ <i>E-Commerce</i> ] ATTAP, Inc. (riffs.com, LifeIO.com & personaldna.com)
June. 2001–Jun. 2010	<b>Member, Scientific Advisory Board.</b> [ <i>Biotech</i> ] BioArray Solutions, New Jersey, USA.
Aug. 2004–Jun. 2006	<b>Consultant.</b> [ <i>E-Commerce</i> ] ATTAP, Inc. (riffs.com, LifeIO.com & personaldna.com)
Jun. 2002–Jun. 2005	<b>Member, Scientific Advisory Board.</b> [ <i>Internet</i> ] AssistClick.com, Inc., New York, USA.
Jul. 2001–Jun. 2004	<b>Member, Scientific Advisory Board.</b> [ <i>Internet</i> ] ez-ways.com, Inc., New York, USA.
Jan. 2000–Jun. 2003	<b>Member, Technical Advisory Board.</b> [ <i>Internet</i> ] pmetrics.com, California.
Dec. 1997–Dec. 1999	<b>Consultant.</b> [ <i>Finance</i> ] Gerard, Klauer & Mattison, Inc. and Pattern Recognition Fund, L.P. New York
Nov. 1996–Jul. 1997	<b>Consultant.</b> [ <i>Finance</i> ] Market Methodology, Inc., California.
Jan. 1996–Jul. 1997	<b>Consultant.</b> [ <i>Finance</i> ] Lawrence, O'Donnell & Marcus, Inc. and Gerard, Klauer & Mattison, Inc., New York.
Sep. 1995–Jan. 1996	<b>Consultant.</b> [ <i>Finance</i> ] Cornerstone Asset Management, New York.
May 1994–Jun. 1994	<b>Consultant.</b> [ <i>Cryptanalysis</i> ] Bush-Ross Design Inc., New York
May. 1991–Oct. 1994	<b>Consultant.</b> [ <i>Finance</i> ] Tudor Investments Corporation, New York.

May 1982–Sep. 1983 **Consultant.** [*Compiler*]  
Tartan Laboratories Inc., Pittsburgh.  
(with Bill Wulf, Guy Steele, John Nestor and Joe Newcomer).  
Summer of 1979 **Designer.** [*Communication*]  
Electronics and Radar Development Center(LRDC), Bangalore, India.

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## Editorial Duties

- (2012–Present) Member, Editorial Advisory Board, *CSI Journal of Computing*, Computing Society of India, India.
- (2012–Present) Member, Editorial Advisory Board, *Versita*, Emerging Science Publisher.
- (2006–Present) Member, Editorial Board, *Nanotechnology, Science and Applications*, Dove Medical Press Ltd.
- (2003–Present) Member, Editorial Board, *Computational Systems Biology*, Springer Verlag.
- (2002–2011) Member, Editorial Board, *AMRX: Applied Mathematics Research Exchange*, Oxford Journals.
- (2003–2010) Senior Editor, *Molecular Cancer Therapeutics*, American Association for Cancer Research, Stanford University Library.
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## Inventions

### Patents Granted/Pending

#### BioInformatics

- [1] **Genomics via Optical Mapping with Ordered Restrictions Maps**, (Co-Inventors: T.S. Anantharaman and D.C. Schwartz), United States Patent, Patent Number: US Patent 06174671, Date of Patent: January 16 2001.
- [2] **System, Process and Software Arrangement for Disease Detection using Genome Wide Haplotype Maps**, United States Patent, Patent Number: 10/553,618 Date of Patent: October 17 2007. Licensed (non-excl).
- [3] **Aligning Sequences with Non-Affine Gap Penalty: PLAINS Algorithm a Practical Implementation, and Its Biological Applications in Comparative Genomics**, (Co-Inventors: O. Gill and Y. Zhou), United States Patent, Patent Number: US Patent 7,788,043, Date of Patent: August 31 2010.
- [4] **Method, Computer-Accessible Medium and System for Base-Calling and Alignment**, United States Patent, Patent Number: 13/266,662, Date of Patent: April 27 2010.
- [5] **Process, Software Arrangement and Computer-Accessible Medium for Obtaining Information Associated with a Haplotype**, (Co-Inventors: W. Casey and T Anantharaman), United States Patent, Patent Number: US Patent 7,805,282, Date of Patent: September 28 2010.



- [6] **System and Method for Sequence Validation via Optical Map Matching**, (Co-Inventors: M. Antoniotti, T.S. Anantharaman and S. Paxia), United States Patent. [aka System and Process for Validating, Aligning, and Reordering One or More Genetic Sequence Maps using at least One Ordered Restriction Map, Co-Inventor: D.C. Schwartz added by WARF, Wisconsin.] United States Patent, Patent Number: US Patent 7,831,392, Date of Patent: November 9 2010.
- [7] **Methods, Software Arrangements, Storage Media, and Systems for Genotyping or Haplotyping Polymorphic Genetic Loci for Strain Identification**, (Co-Inventor: V. Cherepinsky), United States Patent, Patent Number: US Patent 7,917,297, Date of Patent: March 29 2011.
- [8] **Methods, Computer-Accessible Medium, and Systems for Score-Driven Whole-Genome Shotgun Sequence Assembly**, United States Patent, Patent Number: 13/139,809, Date of Patent: July 15 2011.
- [9] **System and Method for Rapid Searching of Highly Similar Protein-Coding Sequences using Bipartite Graph Matching**, (Co-Inventors: B. Sun, J.T. Schwartz, and O. Gill), United States Patent, Patent Number: US Patent 8,050,872, Date of Patent: November 1 2011.
- [10] **Method, System and Software Arrangement for Haplotypic Sequencing**, United States Patent, Patent Number: 8,140,269, Date of Patent: March 20 2012.
- [11] **Methods, Computer-accessible Medium, and Systems for Score-Driven Whole-Genome Shotgun Sequence Assembly**, United States Patent, Patent Number: 13/986,485, Date of Patent: May 6 2013.
- [12] **System, Method and Software Arrangement for Bi-Allele Haplotype Phasing**, United States Patent, Patent Number: 8,473,221, Date of Patent: July 25 2013. Licensed (non-excl).
- [13] **Method, System and Software Arrangement for Haplotypic Sequencing**, United States Patent, Patent Number: 14/269,670, Date of Patent: May 5 2014. Licensed (non-excl).
- [14] **System, Method and Computer-Accessible Medium for Genetic Base Calling and Mapping**, United States Patent, Patent Number: 14/543,016, Date of Patent: November 17 2014.

## BioMedical

- [15] **A Versatile Statistical Analysis Algorithm to Detect Genome Copy Number Variation**, (Co-Inventors: R.S. Daruwala and A. Rudra), United States Patent, Patent Number: US Patent 7,937,225, Date of Patent: May 3 2011. Licensed (excl).
- [16] **Process, Software, Arrangement and Computer-Accessible Medium for Obtaining Diagnosis, Prognosis, Risk Evaluation, Therapeutic and/or Preventive Control Based on Generic or Personalized Models of Various Diseases, including Cancer**, United States Patent, Patent Number: 13/420,145, Date of Patent: March 14 2012.

- [17] **Methods, Computer-Accessible Medium and Systems to Model Disease Progression using Biomedical Data from Multiple Patients**, United States Patent, Patent Number: 15/032,903, Date of Patent: April 28 2016.

### **Biotechnology**

- [18] **Computer-Based Methods and Systems for Sequencing of Individual Nucleic Acid Molecules**, (Co-Inventors: D.C. Schwartz), United States Patent, Patent Number: US Patent 06221592, Date of Patent: April 24 2001.
- [19] **Methods and Systems for Measuring a Feature of an Object**, United States Patent, Patent Number: 12/817,004, Date of Patent: April 27 2010.
- [20] **Method of Probe Design for Nucleic Acid Analysis by Multiplexed Hybridization**, (Co-Inventor: V. Cherepinsky, G. Hashmi and M. Seul), United States Patent, Patent Number: US Patent 7,858,301, Date of Patent: December 28 2010.
- [21] **Compositions and Methods for Analyzing Immobilized Nucleic Acids**, United States Patent, Patent Number: 8,566,038, Date of Patent: October 22 2013.
- [22] **Method, System and Software Arrangement for Haplotypic Sequencing**, United States Patent, Patent Number: 8,718,951, Date of Patent: May 6 2014.
- [23] **System, Method and Computer Accessible-Medium for Multiplexing Total Recaller**, United States Patent, Patent Number: 62/331,712, Date of Patent: May 4 2016.
- [24] **Maximum Depth Sequencing Methods and Kits**, United States Patent, Patent Number: 15/207,051, Date of Patent: July 11 2016. Licensed (excl).
- [25] **System, Method and Computer-Accessible Medium for Bayesian Base-Calling of Nanopore Events for Portable Clinical Genomics**, United States Patent, Patent Number: 62/365,694, Date of Patent: July 22 2016.
- [26] **System, Method, Computer-Accessible Medium Apparatus for Dna Mapping**, United States Patent, Patent Number: 62/443,325, Date of Patent: January 6 2017.

### **Cyber Physical/Internet/Cyber Security**

- [27] **System, Method, and Computer-Accessible Medium for Providing a Multi-Objective Evolutionary Optimization of Agent-Based Models**, (Co-Inventors: G. Narzisi and V. Mysore), United States Patent, Patent Number: US Patent 8,015,127, Date of Patent: September 6 2011.
- [28] **System, Method and Computer-Accessible Medium for Deterrence of Malware**, United States Patent, Patent Number: 14/862,808, Date of Patent: September 23 2015.
- [29] **System, Method and Computer-Accessible Medium for Supporting at least one Cyber-Physical Signaling Game**, United States Patent, Patent Number: 62/338,847, Date of Patent: May 19 2016.
- [30] **Signaling Game Machine Architecture, System, Software, Computer-Accessible Medium and Hardware**, United States Patent, Patent Number: 15/206,943, Date of Patent: July 11 2016.

## Data Science

- [31] **System and Method for Surface Rendering of Internal Structures within the Interior of a Solid Object**, (Co-Inventors: D. Karron and J. Cox), United States Patent, Patent Number: US Patent 5898793, Date of Patent: April, 27 1999.
- [32] **Methods, Systems and Software Arrangement for Reconstructing Formal Descriptive Models of Processes from Functional/Modal Data using Suitable Ontology (GOALIE)**, (Co-Inventors: M. Antoniotti and N. Ramakrishnan), United States Patent, Patent Number: US Patent 7,801,841, Date of Patent: September 21 2010.
- [33] **Method and System for Data Classification in the Presence of Temporal Non-Stationarity**, (Co-Inventor: G. Berger), United States Patent, Patent Number: US Patent 7,818,318, Date of Patent: October 19 2010.
- [34] **System, Method and Software Arrangement Utilizing a Multi-Strip Algorithm that can be Applied to Gene Characterization Using DNA-Array Data**, (Co-Inventors: G. Lerman et al.), United States Patent, Patent Number: US Patent 7,957,908, Date of Patent: June 7 2011.
- [35] **Methods, Computer-Accessible Medium and Systems for Facilitating Data Analysis and Reasoning About Token/Singular Causality**, United States Patent, Patent Number: 13/580,180, Date of Patent: August 21 2012.
- [36] **Systems, Methods and Computer-Accessible Mediums for Utilizing pattern Matching in Stringomes**, United States Patent, Patent Number: 14/763,310, Date of Patent: January 24 14.
- [37] **Method, System, and Computer-Accessible Medium for Inferring and/or Determining Causation in Time Course Data with Temporal Logic**, United States Patent, Patent Number: 8,762,319, Date of Patent: July 24 2014.
- [38] **System, Method and Computer-Accessible Medium for Secure and Compressed Transmission of Genomic Data**, United States Patent, Patent Number: 14/852,936, Date of Patent: September 14 2015.
- [39] **Method, System and Software Arrangement for Detecting or Determining Similarity Regions between Datasets**, (Co-Inventors: S. Paxia and Y. Zhou), United States Patent, Patent Number: 9,390,163, Date of Patent: July 12 2016.
- [40] **System, Method and Computer-Accessible Medium for Creolizing the World Wide Web**, United States Patent, Patent Number: 62/423,534, Date of Patent: November 17 2016.

## Finance/Fintech

- [41] **Storage, Retrieval, Analysis, Pricing, and Marketing of Personal Health Care Data using Social Networks, Expert Networks, and Markets**, United States Patent, Patent Number: 14/407,518, Date of Patent: July 14 2013.

- [42] **Methods, Computer-Accessible Medium, and Systems to Rank, Cluster, Characterize and Customize Users, Digital Contents and Advertisement Campaigns based on Implicit Characteristic Determination**, United States Patent, Patent Number: 14/854,461, Date of Patent: September 15 2015.
- [43] **System, Method and Computer Accessible Medium for Making a Prediction from Market Data**, United States Patent, Patent Number: PCT/US16/32225, Date of Patent: May 12 2016. Licensed (excl).
- [44] **System, Method and Computer-Accessible Medium for Efficient Simulation of Financial Stress Testing Scenarios with Suppes-Bayes Causal Networks**, United States Patent, Patent Number: 62/417,188, Date of Patent: November 3 2016.

## Robotics

- [45] **Reactive Robotic Gripper**, (Co-Inventor: M. Teichmann), United States Patent, Patent Number: US Patent 005541485, Date of Patent: July 30, 1996.

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## Videos (Selected)

- [1] **The Genome Question: Moore vs. Jevons with Bud Mishra**,  $\approx$  78 minutes, Google NYC Tech Talk, *You Tube Video*, Google, 111 8th Ave, New York, NY, March 27, 2012.  
[<http://www.youtube.com/watch?v=VWePa16iX20>]
- [2] **Cell Talk**,  $\approx$  55 minutes, ISR Distinguished Lecture, *2004 ISR Video Archive*, the Institute for Systems Research, A. James Clark School of Engineering, University of Maryland, November 16 2004.  
[<http://www.isr.umd.edu/VideoReports/2004/mishra.html>]
- [3] **Alchemy of Genomics: Optical Mapping**,  $\approx$  70 minutes, SCS Distinguished Lecture, *School of Computer Science, Video Collection*, Carnegie Mellon, 20 February, 1997.  
Also appears on The Universal Library Project [[www.ul.cs.cmu.edu](http://www.ul.cs.cmu.edu)] at Carnegie Mellon University.

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## Publications

### Books and Monographs (Authored & Coauthored)

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- [206] “Recent Progress in Characteristic Set Computation: Complexity & Open Problems,” (with G. Gallo), *Proceedings of the International Workshop on Mathematics Mechanization*, Institute of Systems Science, Academia Sinica, pp. 28–37, International Academic Publishers, (Editors: Wu Wen-Tsün and Cheng Min-De), Beijing, P.R. China, July 16–18, 1992.
- [207] “Workholding—Analysis and Planning,” *Proceedings: IEEE/RSJ International Workshop on Intelligent Robots and Systems: IROS'91*, pp. 53–57, Vol. 1, Osaka, Japan, November 3–5, 1991.  
 [207 A] Reprinted in the Proc. of the Workshop on *Geometric Algorithms for Manufacturing*, ICRA '93, Atlanta, Georgia, May 1993.
- [208] “Some Constructions in Rings of Differential Polynomials,” (with G. Gallo and F. Ollivier), *Proceedings of the Applied Algebra, Algebraic Algorithms, Error Correcting Codes Symposium: AAEECC 9*, (New Orleans, October 7–10), *Lecture Notes in Computer Science*, pp. 171–182, Vol. 539, (Eds. H.F. Mattson, T. Mora and T.R.N. Rao), Springer-Verlag, Berlin, New York, October 1991.  
 [208 A] A part of the results appeared as “Some Constructions in Rings of Differential Polynomials,”

(with Giovanni Gallo), Robotics Technical Report No. 244, Courant Technical Report No. TR # 1991-547-R244, February, 1991, 12 pp.

- [209] “On-line Scheduling in the Presence of Overload,” (with S. Baruah, G. Koren, A. Raghunathan, L. Rosier and D. Shasha), *Proceedings: 32nd Annual Symposium on Foundations of Computer Science: FOCS’91*, pp. 100–110, San Juan, Puerto Rico, October 2–4, 1991.  
[209 A] A part of the results appeared as “On-Line Schedulers for Overloaded Real-time Systems,” (with G. Koren, A. Raghunathan and D. Shasha), Robotic Report No. 246, Courant Technical Report No. TR # 1991-558-R246, April, 1991, 27pp.
- [210] “Dexterous Manipulation: A Geometric Approach,” **Advances in Robot Kinematics**, (With Emphasis on Symbolic Computation), Vol. **XIV**, *Proceedings of the Second International Workshop on Advances in Robot Kinematics*, (Linz, Austria, September, 10–12, 1990), (Edited by S. Stifter and J. Lenarčič), pp. 17–27, Springer-Verlag, Wien, New York, 1991.
- [211] “Fine Manipulation with Multifinger Hands,” (with J.-W. Hong, G. Lafferriere and X. Tan), *1990 IEEE International Conference on Robotics and Automation: ICRA’90*, pp. 1568–1573, Cincinnati, Ohio, May 13–18, 1990.  
[211 A] Reprinted in the Proc. of the Workshop on *Geometric Algorithms for Manufacturing*, ICRA ’93, Atlanta, Georgia, May 1993.

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### **Abstracts & Extended Abstracts**

- [212] “A novel Technologically Agnostic De Novo Sequence Assembler,” (with G. Narzisi), **SBNST 2010**, *Systems Biology and New Sequencing Technologies*, CRG, Barcelona (Spain), 16–18, June 2010.
- [213] “S\*M\*A\*S\*H: Single Molecule Approach to Sequencing by Hybridization,” (with P. Franquin), **SBNST 2010**, *Systems Biology and New Sequencing Technologies*, CRG, Barcelona (Spain), 16–18, June 2010.
- [214] “FastCaller: A New Base Caller for DNA Re-Sequencing,” (with F. Menges), **SBNST 2010**, *Systems Biology and New Sequencing Technologies*, CRG, Barcelona (Spain), 16–18, June 2010.
- [215] “PSST: A Web-Based System for Tracking Political Statements,” (Extended Abstract), (with S. Kleinberg), **WWW 2008**, *The 17th International World Wide Web Conference*, Beijing, China, 21–25 April 2008.
- [216] “Algebra, Automata, Algorithms, Biology & Beyond,” (Extended Abstract), *International conference in memory of Giuseppa Carrà Ferro*, Catania, Italy, 26-28 March 2008.
- [217] “Logic in the Time of Malaria: Segmenting Time Course Data to Understand the Plasmodium Falciparu Life Cycle,” (with S. Kleinberg and K. Casey), *The Sixth Asia Pacific Bioinformatics Conference*, **APBC-Poster2008**, Kyoto, Japan, 14-17 January 2008.
- [218] “Genetic Fingerprints of Human Embryonic Stem Cells by Copy Number Variant Analysis,” (with H. Wu, K.J. Kim, K. Mehta, S. Paxia, A. Sundstrom, T.S. Anantharaman, A.I. Kuraishy, T. Doan, J. Ghosh, A. Pyle, A. Clark, W. Lowry, G. Fan, T. Baxter, Y. Sun and M.A. Teitell), *The Institute for Stem Cell and Regenerative Medicine (ISCRM) Meeting*, University of Washington, Seattle, November 5 2007.

- [219] “Automated Abstraction-Refinement of Hybrid Automata for Monotonic CTL Model Checking,” (with R. Gentilini and K. Schneider), *Computation and Logic in the Real World*, **CiE 2007**, University of Siena, Italy, June 18-23, 2007.
- [220] “SMASH: Single Molecule Approach to Sequencing by Hybridization,” (With T.S. Anantharaman, V. Demidov, A. Lim, S. Paxia and J. Reed), *Advances in Genome Biology & Technology Conference*, **AGBT 2007**, Marco Island, Florida, February 8-11, 2007.
- [221] “Whole Genome Scanning and Oncogenomics with BuddhaCGH Software Pipeline,” (With S. Paxia, T.S. Anantharaman and I. Ionita-Laza), *Oncogenomics 2007: Dissecting Cancer Through Genome Research*, Pointe Hilton Tapatío Cliffs Resort, Phoenix, Arizona. January 31 - February 3, 2007.
- [222] “Choosing the Optimal Platform and Analysis for Prostate Cancer Array CGH,” (With A. Pearlman, T. Anantharaman, and H. Ostrer), *American Society of Human Genetics 2006 Annual Meeting*, New Orleans, LA, October 9–12, 2006.
- [223] “Quantitative analysis of germline mitosis in adult *C. elegans*,” (with J. Maciejowski, N. Ugel, M. Isopi and E.J.A. Hubbard), *Model Organisms to Human Biology 2006 Conference*, San Diego, California, January 5–7, 2006.
- [224] “Single Molecule Approaches to Genomic Analysis,” (with T.S. Anantharaman, C. Cantor, V. Demidov, C.W. Dykes, J. Gimzewski, B.B. Magee, P.T. Magee, M. Place, T. Rast, J. Reed and M. Teitell), *Advances in Genome Biology & Technology Conference*, **AGBT 2006**, Marco Island, Florida, February 8–11, 2006.
- [225] “Tolque: A Tool for Algorithmic Algebraic Model Checking,” (With V. Mysore, A. Casagrande and C. Piazza), *The Ninth International Workshop on Hybrid Systems: Computation and Control*, **HSCC 2006**, Santa Barbara, California, March 29–31, 2006.
- [226] “A Computational Approach to Characterize Germline Proliferation,” (with J. Maciejowski, N. Ugel, M. Isopi, and E.J.A. Hubbard), *Fifteenth International C. elegans Meeting*, University of California at Los Angeles, June 25–29, 2005, LA.
- [227] “Modeling and Simulation of the Behavior of Proliferating *C. elegans* Germ Cells,” (with J. Maciejowski, N. Ugel, M. Isopi, and E.J.A. Hubbard), *East Coast Worm Meeting*, June 11–13, 2004, Yale University, New Haven, CT.
- [228] “A Novel Alignment-Independent Phylogenomic Method,” (With Y. Zhou), *New England Molecular Evolutionary Biologists 15th Annual Meeting*, Tufts University, Medford, Massachusetts, November 6, 2004.
- [229] “Computational Approaches to Understand Germline Stem Cell Behavior in *C. elegans*,” (With J. Maciejowski, N. Ugel, M. Isopi, E.J.A. Hubbard), *Germ Cells Meeting*, Cold Spring Harbor Lab, October, 2004.
- [230] “Competitive Hybridization Model,” (with V. Cherepinsky), *STATPHYS 22*, Bangalore, July 2004.
- [231] “Genome Evolution by Substitutions, Duplications and Deletions,” (with Y. Zhou), *STATPHYS 22*, Bangalore, July 2004.
- [232] “Design of an Optimal Microarray Hybridization Experiment for Genotyping, or Solving HLA Typing as an Optimization Problem on a Weighted Graph,” (with V. Cherepinsky), *SIAM Life Sciences*, July 2004.



- [233] “Probabilistic Error Bounds with Application to Genotyping Microarray Design,” (with V. Cherepinsky), *AWM Minisymposium on Mathematical Biology (MS9)*, July 2004.
- [234] “Modeling and Simulation of the Behavior of Proliferating *C. elegans* Germ Cells,” (with J. Maciejowski et al.), *The East Coast Worm Meeting*, Yale Univ, June 2004.
- [235] “Multi-resolution Analysis of Biological Networks with ‘Memory’: RAS pathway, Cell Cycle and Immune System,” (with P. Barbano et al.), *The Fourth International Georgia Tech Conference on Bioinformatics*, Atlanta, GA, November 2003.
- [236] “Modeling and Simulating Genome Evolution by Duplication,” (with Y. Zhou et al.), *2003 CSH meeting on Genome Informatics*, CSHL, LI, May 2003.
- [237] “Time/Frequency Analysis Of Complex Biological Systems,” (with P. Barbano et al.), *2003 CSH meeting on Genome Informatics*, CSHL, LI, May 2003.
- [238] “Competitive Hybridization Model,” (with V. Cherepinsky et al.), *2003 CSH meeting on Genome Informatics*, CSHL, LI, May 2003.
- [239] “Simulating Large Biochemical and Biological Processes and Reasoning about their Behaviour.” (with M. Antoniotti, F. Park, A. Policriti and N. Ugel), *3rd International Conference on Systems Biology, ICSB 2002*, Karolinska Institutet, Stockholm, Sweden, 2002.
- [240] “Detecting and Modeling Long Range Correlation in Genomic Sequences,” (with Y. Zhou et al.), *International Conference on Complex Systems (ICCS2002)*, Nashua, NH, June 9-14, 2002. (Organized by New England Complex Systems Institute.)
- [241] “Genome Evolution Models, Gene Grammar and Valis Genome Analysis Tool,” (with Y. Zhou et al.), *Fifteenth Annual Meeting on Genome Sequencing & Biology*, Cold Spring Harbor Laboratory, Long Island,, May 2002.
- [242] “Correspondence Mapping Algorithms,” (with J.A. West et al.), *Fifteenth Annual Meeting on Genome Sequencing & Biology*, Cold Spring Harbor Laboratory, Long Island,, May 2002.
- [243] “Haplotyping with Phased RFLPs—Algorithms and Mathematical Models,” (with W. Casey et al.), *Fifteenth Annual Meeting on Genome Sequencing & Biology*, Cold Spring Harbor Laboratory, Long Island,, May 2002.
- [244] “Mathematically Modeling Stem Cells Populations,” (with M. Antoniotti et al.), *Fifteenth Annual Meeting on Genome Sequencing & Biology*, Cold Spring Harbor Laboratory, Long Island,, May 2002.
- [245] “Validation and Scaffolding of Microbes Sequence Data with Optical Maps,” (with M. Antoniotti et al.), *Fifteenth Annual Meeting on Genome Sequencing & Biology*, Cold Spring Harbor Laboratory, Long Island,, May 2002.
- [246] “A Versatile MicroArray Data Base: Goals, Design, and Implementation,” (with M. Rejali et al.), *Fifteenth Annual Meeting on Genome Sequencing & Biology*, Cold Spring Harbor Laboratory, Long Island,, May 2002.
- [247] “Single Molecule Sequencing Approach to Find Expressed mRNA,” (with M. Merjan), *Fifteenth Annual Meeting on Genome Sequencing & Biology*, Cold Spring Harbor Laboratory, Long Island,, May 2002.
- [248] “Optical Mapping: New Technologies and Applications” , (with D.C. Schwartz et al.), *Ninth DOE Genome Contractor and Grantee Workshop*, Oakland, CA, January 2002.

- [249] “Correspondence Mapping Algorithms” , (with L. Cassier et al.), *Ninth DOE Genome Contractor and Grantee Workshop*, Oakland, CA, January 2002.
- [250] “Optical Map Based Sequence Validation of Microbes” , (with M. Antoniotti et al.), *Ninth DOE Genome Contractor and Grantee Workshop*, Oakland, CA, January 2002.
- [251] “A Random Walk Down the Genomes: a Case Study of DNA Evolution in VALIS” , (with Y. Zhou et al.), *Ninth DOE Genome Contractor and Grantee Workshop*, Oakland, CA, January 2002.
- [252] “Goals, Design, and Implementation of a Versatile MicroArray Data Base” , (with M. Rejali et al.), *Ninth DOE Genome Contractor and Grantee Workshop*, Oakland, CA, January 2002.
- [253] “Haplotyping with Phased RFLPs: Algorithms and Mathematical Models” (with William Casey et al.), *Ninth DOE Genome Contractor and Grantee Workshop*, Oakland, CA, January 2002.
- [254] “Design and Implementation of a Versatile MAML-compatible Microarray Database,” (with M. Rejali et al.), *Fifth Annual Conference On Computational Genomics*, TIGR, Baltimore, MD, November 2001.
- [255] “Algorithms for Combining Sequence Data With Optical Maps: Examples from *P. falciparum* and *E. coli*,” (with M. Antoniotti et al.), *13th International Genome Sequencing and Analysis Conference*, San Diego, October 2001.
- [256] “Algorithms and Analysis for Combining Sequences and Msps: Application to the Malaria Parasite *Plasmodium falciparum*,” (with M. Antoniotti et al.), Extended Abstract, *WABI 2001, 1<sup>st</sup> Workshop on Algorithms in BioInformatics*, BRICS, University of Aarhus, Denmark, August 28-31, 2001, Poster Volume, pages 26–28, August 2001.
- [257] “Visualization and Exploration of Genomic Contigs with a Multi-Scale Zoomable Interface,” (with S. Paxia), *1998 Genome Mapping, Sequencing & Biology Conference*, Cold Spring Harbor, New York, page 189, May 13–17, 1998.
- [258] “Requirements for a Viable Verification and Synthesis Tools.” (with M. Antoniotti), *Proceedings of Abstracts: CONMASSYV, DIMACS*, Rutgers University, New Brunswick, NJ, May 13–15, 1996.
- [259] “Automatic Image Analysis for Optical Mapping,” (with E.J. Huff et al.), *1995 Genome Mapping and Sequencing Conference*, Cold Spring Harbor, New York, May 10–14, 1995.
- [260] “An Algorithmic Approach to Fixturing,” *1994 NSF Design and Manufacturing Grantees Conference*, M.I.T., Massachusetts, Cambridge, January 5–7, 1994.

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## Technical Reports

(Excluding those that have appeared in conference proceedings, journals or books.)

- [261] “Investigating Causal Relationships in Stock Returns with Temporal Logic Based Methods,” (with S. Kleinberg, and P. Kolm), arXiv:1006.1791, June 2010.

- [262] “The Temporal Logic of Token Causes,” (with S. Kleinberg), Courant Technical Report No. TR # 2010-926, February 2010.
- [263] “Modal Logic, Temporal Models and Neural Circuits: What Connects Them,” (with S. Kleinberg, M. Antoniotti, and N. Ramakrishnan), Courant Technical Report No. TR # 2007-907, February 2, 2008, 15pp.
- [264] “Remembrance of Experiments Past: Analyzing Time Course Datasets to Discover Complex Temporal Invariants,” (with M. Antoniotti, N. Ramakrishnan, D. Kumar, and M. Spivak), Courant Technical Report No. TR # 2005-858, February 2, 2005, 12pp.
- [265] “Genomics via Optical Mapping IV: Sequence Validation via Optical Map Matching,” (with M. Antoniotti, T. Anantharaman, and S. Paxia ), Courant Technical Report No. TR # 2000-811, March 1, 2001, 15pp.
- [266] “Genomics via Optical Mapping (I): Probabilistic Analysis of Optical Mapping Models,” (with T. Anantharaman), Courant Technical Report No. TR # 1998-770, August 25, 1998, 34pp.
- [267] “Genomics via Optical Mapping III: Contiging Genomic DNA and Variations,” (with T. Anantharaman, and D. Schwartz), Courant Technical Report No. TR # 1998-760, February 28, 1998, 12pp.
- [268] “Genomics via Optical Mapping II(A): Restriction Maps from Partial Molecules and Variations,” (with T. Anantharaman), Courant Technical Report No. TR # 1998-759, February 28, 1998, 8pp.
- [269] “NYU Reactive Gripper: An Implementation,” (with M. Teichmann), Courant Technical Report No. TR # 1996-719, May 1996, 8pp.
- [270] “The Average Case Complexity of Multilevel Syllogistic,” (with J. Cox and L. Ericson), Courant Technical Report No. TR # 1995-711, December 1995, 23pp.
- [271] “NYU Educational Robotics Project: A Pedagogic Overview,” (with M. Antoniotti, F. Hansen and R. Wallace), Courant Technical Report No. TR # 1993-653, November, 1993, 8pp.
- [272] “ED I: NYU Educational Robot,” (with M. Antoniotti) Courant Technical Report No. TR # 1993-643, August 1993, 82pp.
- [273] “Bidirectional Edges Problem: Part II—An Efficient Algorithm,” Courant Technical Report No. TR # 1993-647, September 1993, 45pp.
- [274] “New York University Undergraduate Robotics, CAM, AI and Vision Laboratory,” (with Z. Li and J.T. Schwartz), Robotics Report No. 239, Courant Technical Report No. 530, Courant Institute of Mathematical Sciences, November, 1990, 14pp.
- [275] “Fragmentation of Variable Length Packets,” (with D. Clark), Robotics Report No. 200, Courant Technical Report No. 451, Courant Institute of Mathematical Sciences, May, 1989, 12 pp.
- [276] “Our Exagmination Of Work In Progress: Tele And Dexterous Manipulation,” Robotics Report No. 194, Courant Technical report No. 437, Courant Institute of Mathematical Sciences, March, 1989, 19 pp.

- [277] “Lecture Notes on Lattices, Bases and the Reduction Problem,” Robotics Report No. 113, Courant Technical Report No. 300, Courant Institute of Mathematical Sciences, June, 1987, 31 pp.
- [278] “Admissible Orderings and Bounds on Normal Form Algorithms in Gröbner Bases,” (with T. Dubé and C-K. Yap), Robotics Report No. 88, Courant Technical Report No. 258, Courant Institute of Mathematical Sciences, December, 1986, 29 pp.
- [279] “Extensions to Attribute Grammars,” (with J.R. Nestor, W.L. Scherlis and Wm.A. Wulf), TL 83-36, Tartan Laboratories Incorporated, Pittsburgh, PA, April, 1983, 63 pp.

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### Miscellaneous

- [280] **Designer Molecules for Biosensor Applications**, (with M. Desai and J.T. Schwartz), Banbury Workshop, Cold Spring Harbor Laboratory, *National Science Foundations*, 2003.
- [281] “Pattern Recognition System,” Internal Memo, Pattern Recognition Fund, LP, September, 2000.
- [282] **Game Theory and Learning: Class Notes**, May, 1998. NYU, Approx. 80 pp.
- [283] **Notes on Undergraduate Programming Languages: Class Notes**, January, 1997. Revised September, 1997. NYU, Approx. 100 pp.
- [284] **Notes on Programming Languages: Class Notes**, September, 1996. Revised September, 1997. Revised September, 1998. NYU, Approx. 100 pp.
- [285] **Computational Finance: Class Notes**, June, 1996. NYU and Univ. of Milan, Approx. 106 pp.
- [286] “FFW: Survey and Evaluation,” Internal Memo, Cornerstone Asset Management Partners, December, 1995.
- [287] “Stochastic Pattern Analysis: Bayesian Approach,” Internal Memo, Tudor Investments Corporation, October, 1994. 40pp.
- [288] “Cryptanalysis of a Commercial Code,” Internal Memo, Bush-Ross Design Inc., June, 1994. 10 pp.
- [289] “Nonlinear Regression Models for Financial Applications,” Internal Memo, Tudor Investments Corporation, August, 1992. 29 pp.
- [290] **What is Mathematica?**, An Elementary Approach to Programming in *Mathematica*, Perishable Books, May, 1992. NYU, Approx. 260 pp.
- [291] “A Report on the State of Robotics: Reflections on the Experience in Japan,” A Report to the National Science Foundation, November, 1991. 10pp.
- [292] **Notes on Solid Modeling**, Class Notes, Perishable Books, May, 1991. NYU, Approx. 200 pp.
- [293] “Notes on Recurrence Equations for Analysis of Algorithms,” Class Notes, February, 1986. NYU, 20pp.

- [294] “Ordered Attributed Grammars with Guarded Tree-walk Rules,” Internal Memo, Tartan Laboratories, Pittsburgh, September, 1983. 40pp.
- 

## Post-Doctoral Fellows

### Post-Doctoral Fellows (Past)

- [1] **Sunandan Chakraborty:** (Purdue), 2016–2017. Center for Data Sciences, Intuit.
- [2] **Andreas Witzel:** (Google, NY), 2009–2012. Expedition (NSF), Cancer Hybrid Automata.
- [3] **Eric Aslakson:** (CalTech), 2009–2010. CFIDS, Personalized Medicine.
- [4] **Salvatore Paxia:** (New York University), 2004–2007. NYSTAR, Bioinformatics Environment.
- [5] **Raoul-Sam Daruwala:** (New York University), 2002–2005. NYSTAR & CCPR, Tumor Genome Analysis, Homeland Security..
- [6] **Archisman Rudra:** (New York University), 2000–2005. DOE & NIH, Tumor Genome Analysis.
- [7] **Saurabh Sinha:** (University of Washington, Seattle), 2002–2004. Rockefeller Univ., Computational Biology, Algorithms.
- [8] **William Casey:** (New York University), 2002–2003. DARPA & NIH, Mathematics of Haplotypes & Phylogenetics .
- [9] **Amy Greenwald:** (Brown University), 1998–1999. NSF, Automated Learning in Network Traffic Control.
- [10] **Marek Teichmann:** (MIT), 1995–1996. NSF, Reactive Robotics.
- 

## Graduate Students (Mathematics)

### Graduated Ph.D.s

- [1] **Vera Cherepinsky:** August 4, 2003. NYU & Yale Univ.  
“*On Mathematical Aspects of Genomic Computing.*”
- [2] **William Casey:** April 23, 2002. Math. Univ. of Warwick.  
“*Graph Embeddings with Application in Genomic Experiments.*”

## Graduate Students (Computer Science)

### Graduated Ph.D.s

- [3] **Ilya Korsunsky:** May 2, 2017. Courant Inst.  
“*Survival Analysis Using Probabilistic Graphical Models and Probabilistic Causation with Applications to Cancer Genomics.*”
- [4] **Andrew Sundstrom:** Sept. 3, 2013. Mt. Sinai School of Medicine.  
“*Toward a Computational Solution to the Inverse Problem of How Hypoxia Arises in Metabolically Heterogeneous Cancer Cell Populations.*”
- [5] **Loes Olde Loohuis:** Sept. 11, 2013. UCLA  
“*Cancer Progression: Model, Therapy, Extraction.*”
- [6] **Pierre Franquin:** Feb. 22, 2012. Consultant  
“*On Populations, Haplotypes and Genome Sequencing.*”
- [7] **Giuseppe Narzisi:** May 10, 2011. Cold Spring Harbor Lab  
“*Scoring-and-Unfolding Trimmed Tree Assembler: Algorithms for Assembling Genome Sequences Accurately and Efficiently.*”
- [8] **Samantha Kleinberg:** April 6, 2010. Columbia University  
“*An Algorithmic Enquiry Concerning Causality.*”
- [9] **Antonina Mitrofanova:** May 28, 2009. Columbia University  
“*Efficient Systems Biology Algorithms for Network Analysis over multiple time scales: from Evolutionary to Regulatory time.*”
- [10] **Bing Sun:** August 8, 2006. Bear-Stern  
“*Pairwise Comparison between Genomic Sequences and Optical-Maps.*”
- [11] **Ofer Gill:** May 26, 2006. Bloomberg  
“*Finding Your Match: Techniques for Improving Sequence Alignment in DNA and RNA.*”
- [12] **Iuliana Ioniata:** April 24, 2006. Harvard University  
“*Multimarker Genetic Analysis Methods for High Throughput Array Data.*”
- [13] **Mysore Venkatesh:** March 7, 2006. DE Shaw Research  
“*Algorithmic Algebraic Model Checking: Hybrid Automata and Systems Biology.*”
- [14] **Salvatore Paxia:** December 5, 2003. NYU  
“*Rapid Prototyping in Computational Biology: Multi-scripting Environment, Free-format Databases, Data Manipulation Algorithms and Visualization Widgets in the Valis System.*”
- [15] **Raoul-Sam Daruwala:** July 3, 2002. Google, NYU & ez-ways.com, Inc.  
“*On Computing the Pareto Optimal Solution in Large Scale Dynamic Network.*”
- [16] **Gideon Berger:** April 23, 2001. Blackstone Investment Group & ez-ways.com, Inc.  
“*Knowledge Discovery in Databases for Intrusion Detection, Disease Classification and Beyond.*”
- [17] **Amy Greenwald:** Apr., 21, 1999. Brown University  
“*Learning to Play Network Games.*”

- [18] **Ron Even:** Dec., 21, 1998. Smarts.com  
*“Distributed Intelligence with Bounded Rationality: Applications to Economies and Networks.”*
- [19] **Laxmi Parida:** Jul., 29, 1998. International Business Machine.  
*“Algorithmic Techniques in Computational Genomics.”*
- [20] **Marek Teichmann:** Sep, 14, 1995. Massachusetts Institute of Technology.  
*“Grasping and Fixturing: a Geometric Study and an Implementation.”*
- [21] **Marco Antoniotti:** Sep, 5, 1995. Univ. Cal. at Berkeley.  
*“Synthesis and Verification of Controllers for Robotics and Manufacturing Devices with Temporal Logic and the Control-D System.”*
- [22] **Lars Ericson:** Mar, 31, 1994. CitiBank.  
*“GEDANKEN: A Tool for Pondering the Tractability of Correct Program Technology.”*
- [23] **Gilad Koren:** Sep, 3, 1993. (Co-advisor Shasha.) Bar-Ilan University, Israel.  
*“Competitive Real-time Scheduling.”*
- [24] **Christopher Fernandes:** Jul, 3, 1993. Morgan-Stanley.  
*“Nonholonomic Motion Planning: Algorithms and Software.”*
- [25] **Naomi Silver:** Sep, 10, 1992. Morgan-Stanley.  
*“Control of Dexterous Hands: Theory, Implementation and Experiments.”*
- [26] **Giovanni Gallo:** Apr, 16, 1992. Univ. di Catania, Sicily.  
*“Complexity Issues in Computational Algebra.”*
- [27] **Paul Pedersen:** Feb, 6, 1991. Univ. California, LA.  
*“Counting Real Zeros.”*
- [28] **Anne Dinning:** Jul, 16, 1990. D.E. Shaw and Co., Partner.  
*“Detecting Nondeterminism in Shared Memory Parallel Programs.”*
- [29] **Lou Salkind:** Jan, 26, 1990. D.E. Shaw and Co., Partner.  
*“SAGE: A Real-Time System for Robotic Supervisory Control.”*
- [30] **Pasquale Caianiello:** Nov, 16, 1989. (Co-advisor E. Davis.) Univ. de gli studi di L’Aquila.  
*“Learning as the Evolution of Representation.”*
- [31] **Dayton Clark:** Feb, 23, 1989. Brooklyn College.  
*“Data Communication in Robot Control Systems.”*

### Current Ph.D.s (Computer Science)

- [32] **Abhinav Tamaskar:** Sept., 2018. (Expected)  
 (Foundational Problems in AI)

## Graduate Students (Biology)

### Graduated Ph.D.s

- [33] **Seongho Ryu:** October 2., 2007.  
*“Hypothesis Testing with Systems Biology and Evolutionary Models.”*

- [34] **Fang Cheng:** May 2, 2007. Graham Capital Management, L.P.  
“*Statistical Approaches and Rich Probabilistic Models of Biological Regulation.*”
- [35] **Yi Zhou:** May 5, 2005. Princeton University  
“*Statistical Analyses and Markov Modeling of Duplication in Genome Evolution.*”

## Graduate Students (Medicine)

### Graduated Ph.D.s

- [36] **Justin Jee:** Sept., 2015. Columbia University  
“*Malleability of Information in Genomes, Protein Translation, and Scientific Thought.*”
- 

## Masters Students

### Graduated Masters (with theses, Computer Science)

- [37] **David Kasofsky:** May, 2017.  
“*Ads via Signaling Games.*”
- [38] **Jung-Shih Lo:** May 25, 1995.  
“*DNA Detection from Microscope Images.*”
- [39] **Charles Repetti:** May, 29, 1992.  
“*A Laboratory Exercise to Build a Simple MIDI Controller.*”
- [40] **Ian Lau:** May, 23, 2005.  
“*Designing and simulating a Nano-Bio-Sensor.*”

### Graduated Masters (with theses, Biology)

- [41] **Chiung-wen Chang:** Sept, 14, 2001.  
“*Genome Comparison of *Haemophilus influenzae* and *Helicobacter pylori*26695 .*”

### Undergraduate Mentorship

- [42] **Halley Young:** May, 2017.  
“*A Computational Approach to the Syntax and Semantics of Music.*”

### High-School Mentorship

- [43] **Marcin Mejran:** (Stuyvesant High School), Summer, 2001.  
“*Single Molecule Sequencing Approach to Find Expressed mRNA.*”
- [44] **Abhra Halder:** (Stuyvesant High School), Summer, 2000.  
“*Statistical Simulation for Genomics.*”
- [45] **Moshe Adeshnik:** (Stuyvesant High School), Summer, 1997.  
“*A Simulation of a Robotic Gripper.*”
-



## Grants

### Funded

- [1] *Topology of Cancer Evolution and Heterogeneity*, 5/1/15-4/30/20, *NCI PSOC grant - Total \$10,000,000.*, Columbia/NIH, \$335,432.
- [2] *Fund for Innovation in Cancer Informatics*, 5/1/17-8/30/17, *Anon. Donor.*, ICI, \$25,000.
- [3] *Cyber Security via Signalling Games*, 5/1/15-9/30/16, *Air Force CMU/SEI*, \$149,975.
  
- [4] *Clinical Genomics using TotalRecaller Real-time Base-Caller*, 2014, *Universitys Technology Acceleration & Commercialization (TAC)*, \$50,000.
- [5] *Malicious Behavior and Model Checking*, 2013-2014, *CMU/Airforce*, \$125,000.
- [6] *Nanotechnologies for Determining Gene Expression Patterns from Single Cells*, 2010-2014, NIH, \$212,000 (non-NYU funding).
- [7] *Expeditions in Computing: Collaborative Research: Next Generation Model Checking and Abstract Interpretation with a Focus on Embedded Control and Systems Biology*, 2009-2014, *NSF*, \$10,000,000.
- [8] *Single Molecule Approaches to Sequencing by Hybridization*, 2009-2014, *Abraxis Life Sciences, LLC*, \$625,000.
- [9] *De Novo Genome Assembly of the RCA Gene Cluster Region*, 2012, *Sequenom, LLC*, \$106,000.
- [10] *CDI-Type II: Discovery of Succinct Dynamical Relationships in Large Scale Biological Data Sets*, 2008-2011, *NSF*, \$355,000.
- [11] *Joint Project: Predicting Congestive Heart Failure Using Causal Analysis of EHR Data*, 2009-2010, *NYU Langone Medical Center*, \$27,350.
- [12] *Novel High Throughput Technology for Gene Expression Profiling Based on AFM*, 2007-2010, *NIH Subcontract from UCLA*, \$40,000 per year.
- [13] *Translate science to a cure for CFIDS*, 2009-2010, *The CFIDS Association of America*, \$100,000.
- [14] *IGERT: Program in Computational Biology (COB)*, 2003-2010, *NSF*, \$3,872,625.
- [15] *GRIN: Technology combining Genomics, Robotics, Informatics and Nanotechnology for Single Molecule Analysis*, 2005-2007, *NYNBIT Program, Department of Energy*, \$60,000.
- [16] *Design, Measurements and Algorithms for Biosensor with Nano Cantilevers*, 2005-2007, *Manufacturing Engineering Laboratory Grants Program, NIST*, \$72,500.
- [17] *EMT: Innovative Symbolic Hybrid Systems Models, Inspired by Biological Networks and Bio-Ontology*, 2005-2008, *National Science Foundations, NSF-EMT*, \$300,000.
- [18] *Computational Models for Gene Silencing: Elucidating a Pervasive Biological Defense Response*, 2004-2007, *National Science Foundation*, \$344,996.

- [19] *ITR: Collaborative Research: New approaches to experimental design and statistical analysis of genomic and structural biologic data from multiple sources*, 2003-2008, *NSF-ITR (Medium)*, \$572,000.
- [20] *Haplotype Sequencing via Single Molecule Hybridization*, 2005-2007, *National Institutes of Health, NHGRI*, \$584,788.
- [21] *Large-Scale Emergency Readiness (LaSER) Project: A Public Health Approach*, 2004-2006, *Dept. of Homeland Security*, \$500,828.
- [22] *Responding to Epidemic Threats Using Modern Bioinformatics Tools*, 2004-2006, *Dept. of Homeland Security*, \$396,451.
- [23] *Genomics of Human Cancer*: with M. Wigler, R. Lucito, V. Mittal, and M. Hamaguchi, 2002-2007, *NIH, Cold Spring Harbor Lab*, \$3,543,190.
- [24] *Computational Genomics Tools for Copy-Number Fluctuations in Prostate Cancer*, 2004-2005, *USA-MRMC*, \$109,587.
- [25] *SGER: Biologically Inspired Computation to Understand Regulatory Gene Networks*, 2004-2005, *NSF*, \$100,000.
- [26] *Mathematical & Algorithmic Analysis of Natural and Artificial DNA Sequences*, 2002-2003, *NSF*, \$300,000.
- [27] *Designer Molecules for Biosensor Applications*, 2002, *NSF*, \$49,680.
- [28] *Cell Signaling and Single Molecule Models for BioComputation*: 2001-2004, *Airforce*, \$100,000.
- [29] *Algorithmic and Mathematical Approaches in Cell Informatics*: with H. Weinstein, 2001-2002, *HHMI Biomedical Support Research Grant*, \$100,000.
- [30] *Faculty Development Program for Bioinformatics and Genomics*: 2001-2004, *New York State Office of Science, Technology, & Academic Research (NYSTAR)*, \$750,000.
- [31] *N2010: Nitrogen Networks in Plants*: with G. Coruzzi, 2001-2005, *National Science Foundation*, \$3,000,000.
- [32] *Algorithmic Tools and Computational Frameworks for Cell Informatics*: 2001-2005, *DARPA*, \$1,920,000.
- [33] *High-Density Gene Copy Number Microarrays*: with M. Wigler, 2000-2003, *National Cancer Institute/National Institutes of Health*, \$126,000.
- [34] *Genomics via MicroArrays*: 2000-2001, *University Research Challenge Fund*, \$5,857.
- [35] *BioInformatics Prototyping Language for Mapping, Sequence Assembly and Data Analysis*: 2000-2003, *Department of Energy*, \$880,000.
- [36] *Development for Advanced Systems for Optical Mapping*: with D.C. Schwartz and T.S. Anantharaman, 1999-2001, *Department of Energy*, \$1,587,732.
- [37] *BioInformatics: Computational Genomics*: 1999-2000, *NYU Curr. Challenge Fund*, \$6,562.
- [38] *Urban Research Initiative: Information Technology and the Future of Urban Environments*: with M. Moss, R. Zimmerman, I. Ellen and S. Gregory. 1999-2001, *National Science Foundation*, SBR-98-1-7778, \$499,281.

- [39] *KDI: Automated Learning in Network Traffic Control*: 1998–2001, *National Science Foundation*, \$ 348,347.
- [40] *Optical Mapping of Human Chromosome 18 BAC Clones*: with J. McPherson, R. McCombie and D.C. Schwartz, 1998–2001, *Department of Health and Human Services*, \$ 80,000.
- [41] *Global Analysis of Human Genomic Aberrations by Optical Mapping*: with D.C. Schwartz. 1998–1999, *National Cancer Institute*, \$ 302,757.
- [42] *Optical Approaches for Physical Mapping and Sequence Assembly of the Deinococcus Radiodurans Chromosome*: with D.C. Schwartz. 1998–1999. *Department of Energy, Office of Energy Research*, \$ 64,309.
- [43] *New Physical Methodologies for Genomic Analysis*: with D.C. Schwartz. 1997–1999, *Department of Health and Human Services, National Institute of Health*, \$ 475,812.
- [44] *A Proposal for a DIMACS workshop on Controllers for Manufacturing and Automation: Specification, Synthesis, and Verification Issues—CONMASSYV—*: 1996, *Office of Naval Research (ONR)*, N00014-96-1-0400, \$ 7,000. (+ Supplements of \$ 5,000 from DIMACS and Industrial Support.)
- [45] *Reactive Algorithms in Robotics*: 1995–98, *National Science Foundation (IRIS)*, IRI-9414862, \$ 228,993. No cost extension until 1999.
- [46] *Computational Finance*, 1995–96, *NYU Curricular Development Challenge Fund*, Acct # 6-474-354, \$ 7,000.
- [47] *CISE Research Instrumentation*: with P. Dasgupta, Z. Kedem, K. Palem and D. Shasha. 1995-96, *National Science Foundation (CISE)*, CDA-9421935, \$ 75,429.
- [48] *NYU Reactive Gripper with Industrial and Prosthetic Applications*: 1994–95, *NYU Technology Transfer Funds*, Acct # 6-459-614, \$ 28,000.
- [49] *Computational Algebraic Geometry (Supplement)*: With C.-K. Yap. 1993–1994, *National Science Foundation*, CCR-9002819/CCR-9347117, \$ 21,840.
- [50] *A Proposal for the Educational Grant Program at the Wolfram Research, Inc.*: Co-PI: E. Friedman. 1991, *Wolfram Research, Inc.*, Software Donation.
- [51] *A Group Proposal to Improve the Existing Research Infrastructure at the NYU Robotics Laboratory with Applications to Robotics, Manufacturing, Visualization and Graphics*: With P.K. Wright, J.W. Hong, Z.X. Li, K. Perlin and J.T. Schwartz. January 1991–December, 1991. *National Science Foundation*, CDA-9022527, \$ 56,067.
- [52] *Development of An Inexpensive Robotics, CAM, AI and Vision Laboratory Suitable for Wide Dissemination*: With J.T. Schwartz, Z.X. Li. 1990–1993, *National Science Foundation*, CDA-9018673, \$ 650,000.
- [53] *Geometry of Dexterous Manipulation*: With Z.X. Li. 1990–1992, *National Science Foundation*, IRI-9003986, \$ 88,174.
- [54] *Computational Algebraic Geometry (Accomplishment Based Request for Renewal)*: With C.-K. Yap. 1990–1993, *National Science Foundation*, CCR-9002819, \$ 248,564.
- [55] *Modeling Robots:  $\Phi$ 0—Symbolic Computational Techniques*: 1989–1990, *Office of Naval Research*, N00014-89-J3042, \$ 50,482.

- [56] *Computational Algebraic Geometry*: With C.-K. Yap. 1986–1990, *National Science Foundation*, DMS-8703458, \$ 309,350.
- [57] *A Manufacturing Hand: Understanding the Process of Manipulation for Manufacturing Tasks*: with P.K. Wright, M.L. Nagurka, M.R. Cutkosky and J.T. Schwartz. 1985–1989, *National Science Foundation*, CMU-406349-55586, \$ 525,000.

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## Talks

- DataIku, Manhattan, NY**, April 27, 2021. Fundamental Paradoxes & Biases in Epidemic Research.
- Thelassian (IAQF), Manhattan, NY**, Sept 29, 2020 “Seeking the Self Amidst Covids Cytokine Cyclones.”
- Science and Technologies for Smart Cities, Braga, Portugal**, December, 5 2019 “Tech and the City: Axialization, Institutionalization and Disruption.”
- Galois, Inc, Portland, OR**, Aug 26 2019. “Tech Talk: Cellularization – A Game Theoretic Perspective.”
- Computer Science Colloquium, CUNY Graduate Center, Manhattan, NY**, March 22 2018. “BURPA or BUST! How to Build a Bio-Unified Research Project Agency”
- Plenary Talk, WTCS, Financial Cryptography, Curacao**, March 1 2018. “BURPA or BUST! How to Build a Bio-Unified Research Project Agency”
- Columbia PSOC-NCI Cancer Meeting, Columbia University, Manhattan, NY**, February 9 2018. “Structural Variant Analysis in Cancer via Nanomapping”
- First Tuesday New York Cancer Meeting, NY Cancer Genomics Research Network, NY Genome Center, Manhattan, NY**, January 2 2018. “(Tumor) Genomics via Nanomaps”
- Distinguished Lecture, CYLab, Carnegie Mellon University, Pittsburgh, PA**, November 6 2017. “The Decaying Art of Lying: PHAKING, PHOOLING and PHISHING.”
- ISR Lecture, ISR, Carnegie Mellon University, Pittsburgh, PA**, November 3 2017. “Causarum Cognito: Suppes Probabilistic Causation in Finance and Cancer.”
- Blue Cross and Blue Shield of Louisiana, Baton Rouge, LA**, October 6 2017. “Technology for Tumor Genotypes and Phenotypes: Progress and Challenges.”
- Private Screening and Q&A, Lazard Asset Management, Manhattan, NY**, September 20 2017. “AI and FinTech.”

**Public Screening and Q&A, ICICI, Mumbai, Bengaluru & Delhi, India, September 18 2017.** “AI and FinTech.”

**Public Screening and Q&A, Galvanize, Manhattan, NY, August 20 2017.** “AI and FinTech.”

**Dept of Computer Science, University of Lugano, Zurich, Switzerland, June 16 2017.** “Information Asymmetry and Costly Signaling: What Bitcoins Can Teach.”

**International Conference on Computational Science, ICCS 2017, Zurich, Switzerland, June 14 2017.** “Efficient Simulation of Financial Stress Testing Scenarios with Suppes-Bayes Causal Networks.”

**Como Summer School on Cancer, Development and Complexity, Como, Italy, May 26 2017.** “Causality, Kernels and Clocks in Cancer: A Cook’s Tour.”

**Como Summer School on Cancer, Development and Complexity, Como, Italy, May 23 2017.** “Genomics Technology: Try again, Fail Again, Fail Better.”

**Techonomy, New York, NY, May 16 2017.** “Causality in AI and HealthCare.”

**AMS Spring Sectional Meeting, Hunter College, New York, NY, May 7 2017.** “Causality, Kernels and Clocks in Cancer: A Cook’s Tour.”

**Games, Networks and Social Epistemology, GNSE 2017, CUNY, New York, NY, April 21 2017.** “Deceptive Signaling in Social Networks: {Fake, Pseudo, Artificial} × {News, Science, Intelligence}.”

**NYGC (New York Genome Center), New York, NY, April 20 2017.** “Genomics Technology: Try again, Fail Again, Fail Better.”

**Acquisition Meeting, Washington, DC, March 19 2017.** “GATI.”

**Center for Data Science, New York, NY, March 1 2017.** “Technology for Tumor Genotypes & Phenotypes.”

**IBM, New York, NY, January 27 2017.** “AI and Healthcare.”

**Ravenshaw College – 150th Anniversary, Cuttack, Odisha, India, January 23 2017.** “Famine and Feast and Future.”

**CS Dept., Ravenshaw College, Cuttack, Odisha, India, January 15 2017.** “Causality, Kernels and Clocks in Cancer: A Cook’s Tour.”

**NYU and IBM Meeting, NYU, New York, NY, December 19 2016.** “Creating a Causal Map of Cancer from Patient and Molecular Data.”

**New York Pharma Forum, New York, NY, November 14 2016.** “(Cancer) Genomics via (Sub)Optical Mapping.”

**Mathematical Bioscience Institute, Ohio State University, Columbus, OH, September 28 2016.** “(Cancer) Genomics via (Sub)Optical Mapping.”

**CIBB 2016, Edinburgh University, Edinburgh, Scotland, September 2 2016.** “(Cancer) Genomics via (Sub)Optical Mapping.”

**Bitcoin and Blockchain Technologies, Stirling, Scotland**, August 31 2016. “Deceptive Signaling in Social Networks.”

**University of Chicago, Chicago, IL**, July 27 2016. “(Cancer) Genomics via (Sub)Optical Mapping.”

**spamhaus, New York, NY**, July 26 2016. “BURPA or bust!”

**SEI/CMU, Pittsburgh, PA**, July 14 2016. “Government as the Integrator.”

**United Nations, New York, NY**, July 12 2016. “Artificial Intelligence: Enigma of Imitation.”

**Columbia University, Workshop on Logic and Systems Biology, LICS 2016, New York, NY**, July 9 2016. “Causarum Cognitio: From Khoarsan to Stanford (via Cordova).”

**Big Data Finance 2016, Courant Institute, New York, NY**, May 20 2016. “Mine Hard, Make Money, Have Fun.”

**spamhaus, WeWork, New York, NY**, May 4 2016. “23 & ... Meh: Hopey, Changey Genomic Thingies.”

**Cold Spring Harbor Lab, Long Island, New York, NY**, April 28 2016. “(Cancer) Genomics via (Sub)Optical Mapping.”

**University of Toronto, Toronto, Canada**, March 10 2016. “(Cancer) Genomics via (Sub)Optical Mapping.”

**Mount Sinai School of Medicine, NYC, NY**, January 11 2016. “(Cancer) Genomics via (Sub)Optical Mapping.”

**Cold Spring Harbor Lab, Long Island, NY**, December 16 2015. “(Cancer) Genomics via (Sub)Optical Mapping.”

**9th EAI International Conference on Bio-inspired Information and Communications Technologies, NYC, NY**, December 4 2015. “The Internet of the Future: From Codons to Coding.”

**The Formal Philosophy Seminar at Columbia, New York, NY**, October 20, 2015. “Crelizing the Web.”

**Second Annual Oncology Symposium, Innovation in Cancer Science & Therapy, at Sanofi, Cambridge, MA**, October 16, 2015. “The Canon of Cancer Medicine: Causarum Cognitio.”

**Cancer, Evolution and Complexity, Lake Como School of Advanced Studies, Italy**, September 27, 2015. “Statistical Analysis in Bioinformatics.” (3 Lectures)

**Cognitive Science Institute, IBM, New York**, August 27, 2015. “Causarum Cognitio: On Seeking Knowledge of Causes.”

**Mechanical and Aerospace Engineering Department Colloquium, NYU Poly, Brooklyn, New York**, March 27, 2015. “Control Theory for Cancer Hybrid Automata.”

**Systems Biology Doctoral Training Center Colloquium, University of Warwick, Gibbet Hill Road, Coventry, CV4 7AL, UK**, March 17, 2015. “The Canon of Cancer Medicine.”

**ICDCIT 2015, KiiT, Bhubaneswar, Odisha, India**, February 6, 2015. “Gappy Total Recaller: Efficient Algorithms and Data Structures for Accurate Transcriptomics.”

**GameSec 2014, The Fifth Conference on Decision and Game Theory for Security**, Los Angeles, CA, USA, November 6, 2014. “Enigma of Arrival: Codes, Codons and Coding.”

**Genomics Meets Metabolomics: Seminar at the IGA, Scientific & Technological Park, ZIU, Udine**, October 6, 2014. “Enigma of Arrival: Codes, Codons and Coding.”

**Dipartimento di Ingegneria Informatica Automatica E Gestionale Antonio Ruberti, La Sapienza, Universita di Roma, Roma, Italia**, October 3, 2014 “Towards Cancer Hybrid Automata.”

**Workshop and School on Cancer, Systems and Complexity, Villa del Grumello - via per Cernobbio, 11 - 22100 Como, Italia**, September 28 – October 2, 2014, “The Canons of Cancer Medicine.”

**Hitachi Distinguished Lecture Series, The University of Oklahoma, Oklahoma, USA**, September 12, 2014, “Stringomics: Future of Clinical Genomics.”

**Dept of Computer Science, University of Central Florida, Orlando, Florida**, April 17, 2014. “The Canons of Disease Etiology.”

**Dept of Mathematics, University of Puerto Rico, San Juan, Puerto Rico**, March 21, 2014. “From Spamhaus to Our House.”

**NYU Workshop, UPR Rio Piedras, College of Natural Sciences, San Juan, Puerto Rico**, March 19, 2014. “Transcriptomania.”

**CMACS Reunion, The Graduate Center, CUNY, Manhattan, NY**, February 28, 2014. “Advice to a Young Computational Biologist.”

**Temple City Institute of Technology and Engineering (TITE), Bhubaneswar, Odisha, India**, February 15, 2014. “Enigma of Arrival.”

**ICDCIT 2014, KiiT, Bhubaneswar, Odisha, India**, February 7, 2014. “Cyber Security via Signaling Games: Towards a Science of Cyber Security.”

**Genesis Media, Manhattan, New York**, February 3, 2014. “in other words: Redescription Mining.”

**Computer Science Colloquium, NYU Poly, Brooklyn, New York**, January 31, 2014. “From Spamhaus to Our House.”

**2014 CMACS Workshop on Modeling Biological Systems, Lehman College, Bronx, NY**, January 24, 2014. “Enigma of Arrival.”

**Simons Center for Quantitative Biology, Cold Spring Harbor Laboratory, Long Island, NY, USA**, Aug 14, 2013. “Empirical Bayes, Bayes and Frequentism: Foundations and Hilbert’s 6th Problem.”

**Shengtao Educational Institute Seminar in NYC, New York, NY**, July 26, 2013. “Challenges for Models of Evolution.”

**NYU Faculty Resource Network, New York, NY** Two hours mini course on *Graph Laplacians for Social and Biological Networks* given to faculties of the universities affiliated with FRN. June 11–12, 2013.

**SFAF Meeting 2013, Santa Fe, NM, USA**, May 29, 2013. “Self-Validating Technology-Agnostic Genome Assembly: Genomics to Lean-Omics.”

**BITS Annual Meeting 2013, Udine, Friuli, Italy**, May 23, 2013. “Prometheus Bound: Genomics to Stringomics.”

**Variathon Workshop, Udine, Friuli, Italy**, May 21, 2013. “ $N = 1$ : What We Wish to Learn from a Cancer Patient.”

**ICTP, Trieste, Friuli, Italy**, May 20, 2013. “Signaling and Codon Evolution”

**Software Engineering Institute, Pittsburgh, PA, USA**, May 5, 2013. “in other words: i.e., intelligence extraction.”

**Carnegie Mellon University, Pittsburgh, PA, USA**, May 3, 2013. “The Myth of Tantalus: From Genomics to Lean-omics.”

**Boston University, Boston, MA, USA**, April 18, 2013. “ $N = 1$ : What We Wish to Learn from a Cancer Patient.”

**Univ. Puerto Rico, San Juan, Puerto Rico, USA**, March 27, 2013. “Signaling and Codon Evolution”

**IIIT, Bhubaneswar, Odisha, India**, February 8, 2013. “The Grandest Genomics Experiment Ever!”

**India Bio 2013, Bangalore, India**, February 4, 2013. “The Grandest Genomics Experiment Ever!”

**Hybrid Systems Biology Conference: HSB 2012, New Castle Upon Tyne, UK**, September 3, 2012. “Cancer Hybrid Automata.”

**OpGen Seminar, Gaithersberg, Maryland**, August 29, 2012. “TotalReCaller: Next-Generation Base Callers.”

**Shengtao Educational Institute Seminar in NYC, New York, NY**, July 27, 2012. “Challenges in Bioinformatics Research.”

**CMACS workshop on Systems Biology and Formals Methods, New York, NY**, March 29, 2012. “Pathways and Abstractions.”

**Google Tech Talk, Google, New York, NY**, March 27, 2012. “The Genome Question: Moore vs. Jevons.”

**Mathematics Colloquium, University of Puerto Rico, San Juan, PR**, March 15, 2012. “Darwin, Development and Dysplasia: Signalling Games that Cells Play.”



**COB Colloquium, NYU, New York, NY**, Feb 14, 2012. “The Genome Question: Moore vs. Jevons.”

**IMA Summit Workshop, Institute for Mathematics and its Applications (IMA), Savannah, GA**, February 5, 2012. “Darwin, Development and Dysplasia: Signalling Games that Cells Play.”

**Sequenom, LLC, San Diego, CA**, January 17, 2012. “TotalReCaller: Next-Generation Base Callers.”

**OpGen Seminar, Gaithersberg, Maryland**, January 13, 2012. “The Genome Question: Moore vs. Jevons.”

**Joint Mathematics Meeting of AMS and MAA, Boston, MA**, January 7, 2012. “Darwin, Development and Dysplasia: Signalling Games that Cells Play.”

**janestreet Seminar, New York, NY**, December 16, 2011. “Mining Causality in Biology, Finance and Culture.”

**NYU Astrobiology Kick-off Meeting, Physics Dept., NYU, New York, NY**, December 7, 2011. “Darwin, Development and Dysplasia: Do Exoplanetarians have Exoskeleton?”

**CDI PI Meeting, NYU Bioinformatics Group, New York, NY**, December 7, 2011. “Darwin, Development and Dysplasia: Signalling Games that Cells Play.”

**OpGen Seminar, Gaithersberg, Maryland**, November 11, 2011. “On Single Molecule Technologies.”

**NSF Expedition Site Visit, CMU, Pittsburgh, PA**, November 3, 2011. “Pancreatic Cancer Challenge Problem.”

**BioNanoGenomics Seminar, San Diego, CA**, October 21, 2011. “On Single Molecule Technologies.”

**Dist. Alumnus Award Talk, IIT, Kharagpur, India**, August 22, 2011. “CBGB & omfug.”

**Workshop on Data Intensive Computing, Graphs, and Combinatorics in Bioinformatics, Finance, and National Security, College of Staten Island, CUNY, Staten Island, NY**, July 27, 2011. “Genomics Data Analysis.”

**9th International Workshop on Satisfiability Modulo Theories, (SMT) 2011, Snow Bird, Utah**, July 15, 2011. “When Biology Meets (Symbolic) Computing: Algebra, Biology, Computability and Diophantus.”

**Lipari School on Computational Complex Systems, Jacob T. Schwartz International School for Scientific Research, Lipari, Italy**, July 10, 2011. “Darwin, Development and Dysplasia: Signalling Games that Cells Play.”

**Lipari School on Bioinformatics and Computational Biology, Jacob T. Schwartz International School for Scientific Research, Lipari, Italy**, July 5, 6 & 7, 2011. “Genomics Redux: Man, Woman, Birth, Death, Infinity, Plus Altruism, Cheap Talks, Bad Behavior, Money, God and Diversity on Steroids. (Parts I – III)”

**Eighth Annual Meeting of the Bioinformatics Italian Society (BITS 2011), Pisa, Italy,** June 21, 2011. “Why We keep Assembling...”

**Towards Systems Biology (TSB 2011), Université Joseph Fourier, Grenoble, France,** May 28, 2011. “When Biology Meets (Symbolic) Computing: Algebra, Biology, Computability and Diophantus.”

**Poly Bioinformatics Event, NYU-Poly, Brooklyn, NY,** May 21, 2011. “CBGB & omfug.”

**Panel on Computational Biology, Genomics and Bioinformatics, Courant Institute, Manhattan, NY,** May 7, 2011. “CBGB & omfug.”

**Computational Biology Seminar Series, National Institute of Standards and Technology, Gaithersburg, MD,** April 29, 2011. “Transcriptomania (SUTTA Assembler).”

**Expedition in Computing PI Meeting, University of Maryland, College Park, MD,** April 28, 2011. “Progress on PDAC Progression!”

**Arts and Science Dialogue, Manhattan, New York,** April 9, 2011. “Truth, Glimpsed and Demonstrated.”

**Bhabha Centenary Conference, Tata Institute of Fundamental Research, Mumbai, India,** February 6, 2011. “Sarve Santu Niramaya.”

**Supercomputing: The Imperative and the Path Forward, Abu Dhabi, UAE,** January 9, 2011. “One Thousand and One Arabian Genomes and Beyond: A Human Journey.”

**Temple City Institute of Technology and Engineering (TITE), Bhubaneswar, Orissa, India,** January 4, 2011. “Computational Biology and India.”

**Invited Talks During the Period 2006–2010:** • CIMS Graduate Student Seminar in Mathematics, NYU, Manhattan, New York; • Distinguished Lecture, College of Engineering and Computer Science, University of Central Florida, Orlando, Florida; • Expedition in Computing PI Meeting, NYU, Manhattan, New York; • The Calculus of Medicine: Treatment of Pancreatic Cancer as a Prime Exemplar, Banbury, New York; • Center for Computational Medicine and Bioinformatics (CCMB) Seminar, University of Michigan, Ann Arbor, Michigan; • Computational Biology Seminar, Laufer Center, SUNY, Stonybrook, LI, NY; • Sixth International School on Biology, Computation and Information (BCI 2010), Dobbiaco (BZ), Italy; • Dipartimento di Scienze BioMediche, University of Catania, Catania, Sicily; • Abraxis/Celgene Presentation, Los Angeles, California; • SUMMER 2010, UCLA Visiting Lecturer, Gonda (Goldschmied) Neuroscience & Genetics Research Center, UCLA, LA, California; • National Institute for Science and Education Research (NISER), Bhubaneswar, Orissa, India; • Institute of Mathematics (IoM), Bhubaneswar, Orissa, India; • Illumina, San Francisco, CA; • Ion Torrent, San Francisco, CA; • BioPathways at ISMB 2010, Boston, MA; • Systems Biology and New Sequencing Technologies (SBNST) Conference, Barcelona, Spain; • Symposium on “Reactive Modeling in Science and Engineering,” Institute of Science and Technology, Vienna, Austria; • Decision Procedures in Software, Hardware and Bioware, Dagstuhl, Germany; • C2B2 Bioinformatics Seminar, Columbia University, New York; • Conference on Swarm Intelligence, Bhubaneswar, Orissa; • ITER (Institute of Technical Education and Research), Bhubaneswar, Orissa; • NISER (National Institute of Science Education and Research), IIT (Indian Institute of Technology) and IOP (Institute of Physics), Bhubaneswar, Orissa; • Expedition NSF Site-Visit Meeting, CMU, Pittsburgh, PA; • 2010 CMACS Workshop on Modeling Biological Systems, Lehman College, Bronx, NY; • Expedition Kick-off Meeting, CMU, Pittsburgh, PA; • COB Colloquium, NYU, New York, NY; • Pancreatic Cancer Set-Up Meeting, CMU, Pittsburgh, PA; • Workshop on Identifying Genetic Signatures for the Evolution of Complex Phenotypes, DIMACS, NJ; • Colloquium, Laboratory for Information Systems, MIT, Boston, MA; • Colloquium, Department of Industrial Engineering, Boston University, Boston,

MA; • Workshop on Algorithmics in Human Population-Genomics, DIMACS, NJ; • NHGRI Grantee Meeting, San Diego, CA; • Bioinformatics Colloquium, NYU Poly, Brooklyn, New York; • Tata Institute of Fundamental Research, Colaba, Mumbai, India; • Abraxis Life Sciences, LLC, Los Angeles, CA; • CS Colloquium, NYU, Manhattan, New York; • Molecular Cancer Therapeutics (MCT) Editors' Meeting, Biltmore, Phoenix, AZ; • Sequenom, LLC, San Diego, CA; • CFIDS Kick-off Meeting, Charlotte, NC; • Kavli Future Symposium: Envisioning the Extreme Machine, Muelle, Costa Rica; • Iowa State University Distinguished Lecture, Iowa State University, Ames, Iowa; • Dupont, Wilmington, Delaware; • SAMSI, Research Triangle Park, NC; • IEEE CASE Meeting, Washington, DC; • Brookhaven National Laboratory, Long Island, New York; • International Summer School on Functional Biology, Ragusa, Sicily; • 28th CNLS Annual Conference, Santa Fe, NM; • LA's BEST 2008, Los Angeles, CA; • Cancer Research Center, Medical School of the University of Catania, Catania, Sicily; • Differential Algebra and Related Computer Algebra, A Conference in Memory of Giuseppa Carrà Ferro, Catania, Sicily; • Clay Mathematics Institute & Cold Spring Harbor Laboratory, Workshop on "Algebraic Statistics, Machine Learning and Lattice Spin Models," Banbury, NY; • CCPR-LaSER PLAN C Meeting, New York University, NY; • Mathematics Department Colloquium, Drexel University, Philadelphia, PA; • Electrical Engineering Department Colloquium, University of Pennsylvania, Philadelphia, PA; • Abraxis Life Sciences, LLC, Los Angeles, CA; • BioCon, Inc., Bangalore, India; • ICG Satellite Symposium on Biotechnology, Hong Kong Science & Technology Park, China; • International Genomics Conference (BGI), Shenzhen, Guangdong Province, China; • Joint-CMU-Pitt Computational Biology Meeting, Mellon Institute, Pittsburgh, PA; • C2B2 Seminar, Columbia University, New York, NY; • Syntiron, Inc., Minneapolis, MN; • Algebraic Biology 2007, RISC, Castle of Hagenberg, Austria; • RISC Summer Events of 2007, RISC, Castle of Hagenberg, Austria; • Interface 2007, 39th Symposium on the interface of Statistics, Computing Science, and Applications, Philadelphia, PA; • Computational Biology Seminar, Indian Institute of Technology at Kanpur, India; • Computer Science Department Seminar, Indian Institute of Technology at Kanpur, India; • Workshop on Applications of Algebraic Geometry, Institute for Mathematics and its Applications (IMA), Minneapolis, MN; • Session entitled "New Sequencing Technologies," AGBT: Advances in Genome Biology and Technology 2007, Marco Island, FL; • Principal Investigators Meeting, NHGRI DNA Sequencing Technology Development Program, Marco Island, FL; • Department of Computer Science, NYU, NY; • Biology Seminar, Texas A&M University, College Station, TX; • Museum Seminar, American Museum of Natural History, NY; • CIT 2006, 9th International Conference on Information Technology, Bhubaneswar, Orissa, India; • Bioinformatics Seminar, Arizona State University, Tempe, AR; • Burakoff-Lab Seminar, NYU Cancer Institute, NY; • GM Workshop, General Motors Research, MI; • Bio-Courant-Physics Faculty Exchange 06/07, New York University, NY; • Cancer Genomic Seminar, Yale University, CT; • Cancer Genomic Seminar, Boston University, MA; • DCT Blue Chalk Meeting, British Petroleum, SF; • CNSI (California Nano Systems Institute) Seminar, University of California, LA; • TAMU Distinguished Lecture Series, Department of Computer Science, Dwight Look College of Engineering, Texas A&M University, College Station, TX; • 4th KDD Workshop on Temporal Data Mining: Network Reconstruction from Dynamic Data, Philadelphia, PA; • Cancer Genomics Seminar, Translational Genomic Research Institute, Phoenix, AZ; • Department of Computer Science, Virginia Polytechnic, Blacksburg, VA; • Summer School on Proteomes and Proteins, The International School of Advanced BioMedicine and Bioinformatics and The Lipari International School for Computer Science Researchers, Lipari, Sicily; • Bio-Math Seminar, University of California, LA; • Computer Science Colloquium, University of California, LA; • Banbury Center Conference on Design Principles in Biological Systems, Banbury, LI, NY; • Systems Biology of Cancer Workshop, Mathematical Science Research Institute (MSRI), Berkeley, CA; • 50th Anniversary Celebration of Computer Science Research and Education at CMU, Professor Edmund M. Clarke 60-th Birthday, CMU, Pittsburgh, PA; • National Cancer Institute, National Institutes of Health, Bethesda, MD; • Philips Research, Briarcliff Manor, NY; • Laboratory for Information and Decision Systems, MIT, Boston, MA; • Department of Computer Science, NYU, NY; • Lawrence Berkeley National Laboratory, San Francisco, CA; • Digital Technology Center, University of Minnesota, Minneapolis, MN; • Department of Computer Science, Univ. Wisconsin, Madison, WI; • Bioinformatics Seminar, Computer Science Department, University of Arizona, Tucson, AZ; • Cancer Genomics Seminar, University of Arizona, Tucson, and TGen (Translational Genomic Research Institute), Phoenix, AZ; • Program in Integrative Information, Computer and Application Sciences (PICASso) Talk, Princeton University, Princeton, NJ; • AGBT: Advances in Genome Biology and Technology 2006, Marco Island, FL; • NHGRI DNA Sequencing Technology Development Program, Marco Island, FL.

**Invited Talks During the Period 2001–2005:** • 1st Geometry Workshop: Brooklyn Polytechnic, Brooklyn, New York; • 2005 Howard Hughes Seminar: Dept. of Biology, NYU, NY; • 3rd Annual NYU Cancer Institute Retreat: The Translational Research Program, NYU School of Medicine, Wave Hill, Bronx, NY; • 8th International Meeting of the Microarray Gene Expression Data Society, MGED 8: Bergen, Norway; • 17th Int. Conference on Computer Aided Verification, CAV '05: Edinburgh, Scotland, UK; • ABRF 2001: San Diego, Ca; • Affymetrix[2]: Santa Clara, Ca; • American Museum of Natural History and New York University: Manhattan, NY; • Annual SIAM Meeting: San Diego, CA; • Applied Math Seminar: Courant Institute, New York, NY; • Applied Mathematics Seminar: Yale University, New Haven, CT; • Applied Mathematics Seminar: Department of Applied Mathematics, Columbia University, New York, NY; • Argonne National Laboratory: Chicago; • Banbury Center Conference on From Markers to Models: Integrating Data to Make Sense of Biologic Systems: Banbury, LI, NY; • Banbury Workshop on Formal Languages for Biological Processes: Banbury Center, Cold Spring Harbor Lab, LI, NY; • Banbury Workshop on Designer Molecules for Biosensor Applications: Banbury Center, Cold Spring Harbor Lab, LI, NY; • BioConcur 04: The Royal Society, London, UK; • Biological Language Modeling Workshop: School of Computer Science, Carnegie-Mellon University, Pittsburgh, PA; • Biogeometry Workshop: Symposium on Computational Geometry, Brooklyn, NY; • Bioinformatics Seminar[2]: Cold Spring Harbor Laboratory, Long Island, New York; • Bioinformatics Seminar: Tata Consultancy Services, Hyderabad, India; • Bioinformatics Program Seminar: Boston University, Boston, MA; • Bioinformatics Seminar[2]: Cold Spring Harbor Laboratory, Long Island, NY; • Bioinformatics Lecture: Regeneron Pharmaceuticals, Inc., Tarrytown, NY; • Biologically Motivated Problems in Statistics: STATPHYS 22, Bangalore, India; • Biotechnology Seminar: Indian Institute of Technology, New Delhi, India; • BioTechnology Seminar: SUNY, Stony Brook, LI, NY; • Biotech Center: Univ. of Wisconsin, Madison, WI; • Cancer Institute Seminar: University of California at San Diego, SD, CA; • Center for Studies in Physics & Biology: Rockefeller University, NYC, NY; • CGR: Center for Genomic Research: Harvard University, Boston, MA; • College of Physicians and Surgeons: Columbia University, NY; • Computer Science Colloquium: Institute for Computational Mathematics, Consiglio Nazionale Delle Ricerche, Pisa, Italy; • Computer Science Department[2]: Tata Institute of Fundamental Research, Mumbai, India; • Computer Science Department[2]: City Univ. of New York, New York, NY; • Computer Science Department Seminar: Columbia University, Manhattan, New York; • Computer Science Dept: Univ. of Chicago, Chicago; • Cutting Edge Science in New York City: New York Academy of Sciences, Manhattan, NY; • Dabur India Ltd.: Ghaziabad, UP, India; • DARPA Biocomp Meeting [8]: Falls Church, VA; Arlington, VA; Vienna, VA; Adelphi, MD; Ft. Lauderdale, FL; Washington, DC; Monterey Bay, CA; & Washington, DC; • Demerec In-house Seminar: Cold Spring Harbor Laboratory, Long Island, NY; • Department of Biotechnology: Ministry of Science & Technology, New Delhi, India; • Department of Medical Informatics: Columbia University, Manhattan, New York; • Department of Ob/Gyn: NYU School of Medicine, New York, NY; • Department of Computer Science: Dartmouth College, Hanover, NH; • Department of Computer Science: New York University, Manhattan, NY; • Department of Computer Science: Virginia Polytechnic, Blacksburg, VA; • Department of Human Genetics: Mt. Sinai School of Medicine, NY; • Dermatology Update 2002: Command Hospital (Indian Air Force), Bangalore, India; • DIMACS Workshop on Detecting and Processing Regularities in High Throughput Biological Data: DIMACS, Rutgers University, NJ; • Dipartimento di Matematica e Informatica: University of Udine, Udine, Italy; • Dipartimento di Informatica, Sistemistica e Comunicazione (DISCo): Università degli Studi di Milano Bicocca, Milan, Italy; • Distinguished Lecture Series: University of Maryland, College Park, MA; • Distinguished Lecture Series At Rutgers: Electrical & Computer Engineering, Rutgers University, New Brunswick, NJ; • Distinguished Seminar Series: Drexel University, Philadelphia, PA; • Distinguished Speaker at Delaware: University of Delaware, Newark, DE; • DOE Grantee's Meeting: Oakland, CA; • Duke  $(CB)^2$  (Center for Computational Biology and Bioinformatics) Seminar: Duke University, Raleigh Durham, North Carolina; • ECE/CS Distinguished Lecture: Carnegie-Mellon University, Pittsburgh, PA; • Electrical & Systems Engineering: University of Pennsylvania, Philadelphia, PA; • Friday Afternoon Seminar: Broad Institute, MIT, Cambridge, MA; • Genomics Seminar Series: Skirball Institute of Biomolecular Medicine, New York, NY; • High-Performance Computing Division: Air force, Rome, NY; • I3P Meeting: Dartmouth Institute for Information Infrastructure Protection (I3P) Consortium Meeting, Puck Building, Wagner School, NYU, NY; • Infosys IT Seminar: Bhubaneswar, Orissa, India; • In-house Symposium: Cold Spring

Harbor Laboratory, Long Island, NY; • In-house Genomics Seminar: Cold Spring Harbor Lab, Long Island, NY; • Invited Session, International Conference On High Performance Computing: Bangalore, India; • International Business Machine: Yorktown Heights, NY; • International Conference on Complex Systems (ICCS2002)[2]: Nashua, NH; • ITR Seminar Series (MEL & CSTL): National Institute of Standards and Technology, Gaithersburg, MD; • ITR Medium Meeting at MIT: Massachusetts Institute of Technology, Boston, MA; • Keynote Speech: Conference On High Performance Computing, HiPC 2003, Hyderabad, India; • LaserMED Seminar: Center for Catastrophe Preparedness and Response, NYU, NYC, NY; • Mathematics Department, Graduate Program: Ravenshaw College, Utkal University, Orissa, India; • Mathematics Seminar: SUNY, Stony Brook, LI, NY; • Meeting on Evolutionary Genomics: Biology Department, NYU, NY; • Microarray Data Analysis Workshop: Yale University, New Haven, CT; • National Institute of Immunology: New Delhi, India; • National Institute of Standards and Technology: Gaithersburg, MD; • Nazionale Consorzio Interuniversitario Biotecnologie (LNCIB): AREA Science Park, Trieste, Italy; • NCBS, National center for Biological Sciences: Bangalore, India; • NSF Fellow Seminar: Math for America, Steinhart School of Education, NYU, NY; • NSF QUBIC/ITR Meeting: Ft. Lauderdale, FL; • NSF Workshop on Computational Genomics and Disease Models: MITRE, McLean, Virginia; • NYCBS: New York Academy of Science, Manhattan, NY; • Minisymposium on Microarray and Bioinformatics: Temple University, Philadelphia, PA; • Paper Presentation: International Conference On High Performance Computing, Bangalore, India; • Perlegen Sciences, Inc.: Mountain View, CA; • Persistent System, Inc.: Pune, India; • Plenary Speaker, International Conference on Complex Systems: Boston, MA; • Principal Investigators Meeting: NHGRI DNA Sequencing Technology Development Program, Harvard Medical School, Boston, MA; • Scientific Horizons Seminar: SAC Capital Advisors, LLC, New York, NY; • Second International School on Biology, Computation and Information (BCI 2005): Dobbiaco (BZ), Italy; • SIAM Symposium on Computational Models and Simulation for Intra-Cellular Processes, Washington, DC; • Strand Genomics, Inc.: Bangalore, India; • Stuyvassent High School: Chamber Street, Manhattan, NY; • Systems Biology Seminar: Harvard Medical School, Harvard University, Boston, MA; • Systems Biology Seminar: Tata Consultancy Services, Hyderabad, India; • Translational Systems Biology Talk: Mt. Sinai School of Medicine, New York, NY; • Workshop on Biological Modeling: Courant Institute, Manhattan, NY; • Workshop on Computable Semantics for Complex Biological Systems: Arlington, VA.

**Invited Talks During the Period 1996–2000:** • 11th International School in Computer Science: Computational Biology, Lipari, Sicily; • 1998 Genome Mapping and Sequencing Conference, Cold Spring Harbor Lab, NY; • 1st Industry Day, Computer Science Department, NYU, NY; • 2nd Research Conference on Computational Biology, RECOMB 98, New York, NY; • 9th Genome Sequencing and Analysis Conference '97, Hilton Head, SC; • AML (Applied Mathematics Lab Seminar), CIMS, NYU, NY; • AMS Meeting, Charlotte, NC; • Applied Math. Seminar, Courant Institute of Mathematical Sciences, NY; • Biology and Computing Seminar, New York University, New York, NY; • Bio-Mathematics Division, Mt. Sinai Medical School, New York, NY; • Biophysics Department, Rockefeller University, Manhattan, NY; • Celera Genomics, Rockville, MD; • Cold Spring Harbor Lab, Long Island, NY; • Computer Science Department, Dartmouth College, NH; • Computational Biology Seminar, DIMACS, Rutgers University, NJ; • Delaware Valley Computer Algebra Seminar, University of Delaware and Drexel University, Philadelphia, PA; • Dept. Applied Math., Princeton University, NJ; • Dept. Computer Science, Columbia University, New York, NY; • Dept. of Industrial Engineering, Rutgers University, New Brunswick, NJ; • Department of Mathematics and Statistics, University of Maryland Baltimore Campus, Baltimore, MD; • DIBIT (Dept. of Biological & Technological Research, S. Raffaele Science Park, Milan, Italy; • Dipartimento di Scienza dell'Informazione, Università Degli Studi di Milano, Milan, Italy; • Einstein School of Medicine, Bronx, NY; • The Gaschnig/Oakley Memorial Lecture, Distinguished Lecture, School of Computer Science, Carnegie-Mellon Univ., Pittsburgh, PA; • Harvard University, Boston, MA; • Intelligent Systems for Molecular Biology: ISMB '99, Heidelberg, Germany; • International Symposium on Robotics and Manufacturing, World Automation Congress, WAC'96, Montpellier, France; • IPAM (Institute for Pure and Applied Mathematics), UCLA, LA; • Joint Seminar, Electrical Engineering and Industrial Engineering and Operations Research Dept., University of California at Berkeley, CA; • LIDS (Laboratory for Information and Decision Systems), MIT, MA; • Mathematics Department, Graduate Program, Ravenshaw College, Utkal University, Orissa, India; • Mechanical engineering Department, John Hopkins University, Baltimore, MD; • Microsoft Research, Redmond, Seattle, WA; • Mt. Sinai and NYU FAS Faculty Meeting, New York University,

NY; • National Institutes of Health (NIH), National Human Genome Research Institute (NHGRI), Bethesda, MD; • National Institute of Allergy and Infectious Diseases, National Institutes of Health, Rockville, MD; • National Cancer Institute (NCI), Genetics Department, Bethesda, MD; • NCBI, National Institutes of Health, Bethesda, MD; • NCRR Workshop on Integrated Genomics Technologies, (NCRR, NHGRI, NCI & NIGMS), Washington, DC; • NECSI (New England Complex Systems Institute), New Hampshire, NH; • New York Academy of Science, Manhattan, NY; • NSF Learning and Intelligent Systems PI Meeting, Georgetown University, Washington, DC; • NYU, New York, NY (“A Morning on the Millennium”); • Pan Asian Congress of Mathematicians, First Annual Meeting and Conference, NY; • Post-Graduate Department of Mathematics, Ravenshaw College, Cuttack, Orissa, India; • Probabilistic and Statistical Physics Seminar, Courant Institute of Mathematical Sciences, NYU, NY; • Recent Advances In Science Series, NYU, NY (“Critical Issues In DNA Research.”); • Robotics Institute, Carnegie-Mellon Univ., Pittsburgh, PA; • Rohit Parikh’s 60th Birthday Celebration, City University of New York, Grad. Center, NY and • Seminar on Combinatorial Computing, City University of New York, New York, NY; • Tata Institute of Fundamental Research, Mumbai, India (twice); • The United Technologies Sponsored Seminar Series in Manufacturing and System Sciences, Department of Manufacturing Engineering, Boston University, MA; • University of Chicago, Chicago, IL; • Urban Research Initiative Seminar, Taub Urban Research Center, Wagner School, NYU, NY; • Workshop on Robotics and Computer Vision, DIMACS, Rutgers University, NJ; • Workshop on Grasping, Fixturing, and Manipulation: Towards a Common Language, ICRA 98, Leuven, Belgium; • Workshop on Lie Groups and Lie algebra for Robotics, ICRA 98, Leuven, Belgium & • Workshop on Mathematical Problems in Molecular Sciences, Courant Inst, NY.

**Invited Talks During the Period 1991–1995:** • 1991 AAAS Annual Meeting, Washington, DC; • 4th Int’l conf. on CIM and Automation Technology, RPI, Troy, NY; • Bell Communications Research (Bellcore), Morristown; • Dept. of Computer Science, Columbia University, New York, NY; • Dept. of Mechanical Engineering and Applied Mechanics, University of Pennsylvania, Philadelphia, Pennsylvania; • Dept. of Industrial Engineering, Rutgers University; • Digital Topology Day, Queens College, NY; • Dipartimento di Matematica Pura ed Applicata, Universita degli Studi di L’Aquila, Abruzzo, Italy; • Dipartimento di Matematica, Citta’ Universita, Universita di Catania, Catania, Sicily; • Institute of Industrial Science, University of Tokyo, Roppongi, Tokyo, Japan; • Int’l Conf on Robotics and Automation: ICRA 93, Atlanta; • Int’l Workshop on Intelligent Robots and Systems: IROS’91, Osaka, Japan; • Mathematics Research Center, AT&T Bell Labs, Murray Hill, NJ; • NSF Workshop on Geometric Uncertainty in Robotic Manipulation, Catalina Island, California; • NYU Faculty Resource Network, New York, NY; • Polytechnic University of Brooklyn; • SIAM Minisymposium on Robotics Programming, San Diego, CA; • SODA ’94, Arlington, VA; • Texas A&M University, Texas; • The Second European Workshop on Real-time and Hybrid systems, Grenoble, France; • Tudor Investments Corporation, NY (2) and • WAFR ’94, San Francisco, CA.

**Invited Talks During the Period 1986–1990:** • DIMACS, Rutgers University; • Honeywell, Minneapolis; • Indian Institute of Technology, Kharagpur; • International Workshop on Advances in Robot Kinematics, Linz, Austria; • NASA Goddard Flight Center, Goddard; • Purdue University; • Robotics Institute, Carnegie-Mellon University; • School of Computer Science, Carnegie-Mellon University and • Symposium on Theory of Computing, STOC’90, Baltimore.

**Invited Talks During the Period 1981–1985:** • AT&T Bell Labs, Murray Hill; • Columbia University; • Duke University; • Foundations of Computer Science Conference, FOCS’84, Singer Island, Florida; • IBM, Yorktown Heights; • Logics of Programs Conference, Pittsburgh, PA; • Purdue University; • Tartan Laboratories, Pittsburgh; • University of Chicago and • University of Southern California.

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## Program Committees

(September 7–9, 2017) Program Committee (with A. Policriti et al.), *14th International Conference on Computational Intelligence methods for Bioinformatics and Biostatistics CIBB, 2017*,

Cagliari, Italy.

- (July 10–14, 2015) Program Committee (with S. Kasif, et al.), *ISMB 2015 Conference*, Dublin, Ireland.
- (February 5-8, 2015) Program Committee, *International Conference on Distributed Computing and Internet Technologies: (ICDCIT 2015)*, Bhubaneswar Odisha, India.
- (December 1-3, 2014) Program Committee, *8th International Conference on Bio-inspired Information and Communications Technologies: (BICT 2014)*, Boston, Massachusetts, United States.
- (November 6–7, 2014) Program Committee, *The fifth Conference on Decision and Game Theory for Security: (GameSec 2014)*, Los Angeles, CA.
- (October 19–22, 2014) Program Committee, *12th RECOMB Comparative Genomics: (RECOMB-CG 2014)*, Cold Spring Harbor, LI, NY.
- (September 22–24, 2014) Program Committee (with D. Caucal, et al.), *First International Conference on Formal Methods in Micro-Biology: (FMMB 2014)*, New Caledonia, Pacific Ocean.
- (July 23–24, 2014) Program Committee (with O. Maler, et al.), *Hybrid Systems and Biology: (HSB 2014)*, Vienna, Austria.
- (July 11-15, 2014) Program Committee (with S. Kasif, et al.), *ISMB 2014 Conference*, Boston, Massachusetts, USA.
- (Aril 14–17, 2014) Program Committee (with M. Broy, et al.) *Fourth Workshop on Design, Modeling and Evaluation of Cyber Physical Systems: (CyPhy 2014)*, Berlin, Germany.
- (September 2-8, 2013) Program Committee (with L. Bortolussi, et al.) *Hybrid Systems and Biology: (HSB-ECAL 2013)*, Taormina, Italy.
- (July 21-23, 2013) Program Committee (with S. Kasif and L. Stone) *Twenty First Annual International Conference on Intelligent Systems for Molecular Biology and twelfth Conference on Computational Biology: (ISMB ECCB 2013)*, Berlin, Germany.
- (September 24-27, 2012) Program Committee (with I. Georgoudas, S. Manzoni and G. Sirakoulis) *Fourth International Workshop on Crowds and Cellular Automata: (ACRI 2012)*, Santorini, Greece.
- (September 3-8, 2012) Program Committee (with L. Bortolussi, et al.) *Hybrid Systems and Biology: (HSB-CONCUR 2012)*, New Castle upon Tyne, UK.
- (July 15-17, 2012) Program Committee (with S. Kasif, et al.) *ISMB 2012 Conference*, Long Beach, California, USA.
- (December 23-25, 2011) Program Committee (with P. Tripathy, C. Ungureanu, et al.) *The First International Conference on Future Internet Computing: (ICFIC-2011)*, Bhubaneswar, Orissa, India.
- (December 10-12, 2011) Program Committee (with L. Sweeney, SE. Marcus, R. Kikinis and J. Zhan): *The First IEEE International Conference on Biomedical Computing: (BioMedCom-2011)*, Washington D.C., USA.
- (November 12-15, 2011) Program Committee (with E. Bartocci and L. Bortolussi): *First International Workshop on Hybrid Modeling in Systems Biology: (HMSB 2011)*, Atlanta, GA.

- (September 21-23, 2011) Program Committee (with F. Fages, D. Harel, G. Plotkin, et al.): *9th International Conference on Computational Methods in Systems Biology*: (CMSB 2011), Institut Henri Poincaré, Paris, France.
- (April 12-14, 2011) Program Committee (with E. Frazzoli and R. Grosu): *14th International Workshop on Hybrid Systems: Computation and Control*: (HSCC'06), Chicago, IL.
- (July 31-August 2, 2010) ANB Steering Committee and Program Committee (with B. Buchberger et al.): *Algebraic and Numeric Biology, ANB 2010*, RISC, Castle of Hagenberg, Austria.
- (January 18-21, 2010) Program Committee (with G. Myers et al.): *Asia Pacific Bioinformatics Conference, APBC 2010*, Bangalore, India.
- (July 31-August 2, 2009) Program Committee (with B. Buchberger et al.): *Algebraic Biology, AB 2009*, SAMSI, Research Triangle Park, NC, USA.
- (September, 2007-June, 2008) Organizing Committee/Invited Lecturer (with D. Sumner et al.): *IMA year on the Mathematics of Molecular and Cellular Biology*, Minneapolis, MN.
- (July 31-August 2, 2008) Program Chair: *Algebraic Biology, AB 2008*, RISC, Castle of Hagenberg, Austria.
- (March 29-31, 2008) Program Chair: *Hybrid Systems: Computation and Control, HSCC 2008*, Georgia, Atlanta, USA.
- (June 27-30, 2007) Program Committee (with J. Trinkle): *RSS 2007: Robotics, Sensing and Systems*, Georgia Institute of Technology, Atlanta, GA, USA.
- (April 5-7, 2007) Program Committee (with S. Biswas, P.S. Thiagarajan & J.-C. Latombe): *Workshop on Algorithms for Structural and Systems Biology*, IIT, Kanpur, India.
- (December 15-17, 2006) Program Committee (with L. Parida): *International Symposium on Computational Biology & Bioinformatics*, Bhubaneswar, India.
- (December 3-6, 2006) Program Committee (with P. Mitra & R. Murray): *Engineering Principles in Biological Systems*, Cold Spring Harbor Laboratory, Long Island, NY.
- (October 18-19, 2006) Program Committee (with C. Priami): *CMSB 2006: International Conference on Computational Methods in Systems Biology*, Trento, Italy.
- (August 16-19, 2006) Program Committee (with J. Trinkle): *RSS 2006: Robotics, Sensing and Systems*, Philadelphia, PA.
- (July 16-18, 2006) Program Committee (with N. Amato, S. Akella and W. Huang): *Workshop on Algorithmic Foundation of Robotics*, New York, NY.
- (March 29-31, 2006) Program Committee (with J. Hespanha and A. Tiwari): *9th International Workshop on Hybrid Systems: Computation and Control*: (HSCC'06), Santa Barbara, CA.
- (November 28-30, 2005) Program Committee (with H. Anai): *Algebraic Biology*: (AB2005), Fujitsu Solution Square, Tokyo, Japan.
- (August 16-18, 2005) Program Co-Chair (with C. Priami): *Bioconcur 2005*, San Francisco, CA.



- (August 2-6, 2005) Program Committee (with K. Goldberg): *IROS2005*, Edmonton, Canada.
- (May 2004) Panelist (with J. Beebe, P. Appelbaum, P. Wolpe, and K. Chien) *Robot Stories: Emotional and Ethical Challenges of a Technological Age*, Panel discussion on Psychiatry, Technology and the Arts, American Psychiatry Association Annual Meeting, New York, NY.
- (October 2002) Organizer (with J.T. Schwartz): *Technologies for Dealing with Bioterrorism: Two Assessment/Planning Conferences*, Brookings Institute, Washington, DC.
- (August 2002) Organizer: *Designer Molecules for Biosensor Applications*, Banbury Center, Cold Spring Harbor Laboratory, NY.
- (June 2002) Session Chair: *Conference on Logic and Games*, CUNY Graduate Center, New York, NY.
- (Fall 2000) Working Group (with G. Churchill, J.-M. Claverie, D. Haussler, M. Kronick, K. Lange, P. Smietana, R. Simon, T. Speed, S. Tavaré, M. Waterman and W. H. Wong): *Program on "Functional Genomics"*, Institute of Pure and Applied Mathematics (IPAM), UCLA, Los Angeles, Ca.
- (August 2000) Organizing Committee (with Rohit Parikh): *Workshop on "Probability, Conditionals and Games"*, Courant Institute, New York, NY.
- (July 2000) Program Committee: *2000 ACM International Symposium on Symbolic and Algebraic Computation (ISSAC'2000)*.
- (April 2000) Panelist (with S.J. Gould, D. Bell, E.L. Doctorow, C. Gilligan, T. Judt, L. Nochlin, N. Postman, W. Suzuki): *A Morning on the Millenium*, NYU, NY.
- (October 1999) Chair, Organizing Committee (with Misha Gromov and Ned Seeman): *First Workshop on "Mathematical Problems in the Molecular Sciences"*, Courant Institute, New York, NY.
- (February 1998) Program Committee: *International Conference on Gröbner Bases*, RISC-Linz of the Johannes Kepler Universität, Linz, Austria.
- (July 1996) Program Committee: *1996 ACM International Symposium on Symbolic and Algebraic Computation (ISSAC'96)*, ETH, Zurich.
- (May 1996) Co-organizer with Mohsen Jafari: *DIMACS Workshop on Controllers for Manufacturing and Automation: Specification, Synthesis and Verification Issues (ConMASSy'95)*, Rutgers University, New Brunswick, NJ.
- (February 1994) Program Committee: *Workshop on the Algorithmic Foundations of Robotics (WAFR'94)*, San Francisco, CA.
- (February 1991) Organizer: a session entitled "Robotics and Mathematics" *American Association for the Advancement of Science, 1991 Annual Meeting AAAS-91*, Washington, DC. (Cosponsors: AAAS Sections A, M and T, AMS and IEEE).