Andrew E. Sundstrom — curriculum vitæ

CONTACT INFORMATION

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EDUCATION

Courant Institute of Mathematical Sciences

Ph.D., Computational Biology, Sep 2013

- Dissertation title: "Toward a computational solution to the inverse problem of how hypoxia arises in metabolically heterogeneous cancer cell populations"
- Committee:
  - Prof. Bud Mishra (co-advisor), Courant Institute of Mathematical Sciences
  - Prof. Dafna Bar-Sagi (co-advisor), NYU Langone Medical Center
  - Prof. Leslie Greengard, Courant Institute of Mathematical Sciences
  - Prof. Ravi Iyengar, Icahn School of Medicine at Mount Sinai
  - Prof. Ernest Davis, Courant Institute of Mathematical Sciences

M.S., Computer Science, May 2008

- Thesis title: "Measuring biomolecules: an image processing and length estimation pipeline using atomic force microscopy to measure DNA and RNA with high precision"
- Readers:
  - Prof. Bud Mishra, Courant Institute of Mathematical Sciences
  - Prof. Davi Geiger, Courant Institute of Mathematical Sciences

Cornell University

B.A., Computer Science, Dec 1993

PUBLICATIONS

Refereed journal articles

6. **Andrew Sundstrom**, Dafna Bar-Sagi, Bud Mishra. "Simulating heterogeneous tumor cell populations". *PLoS ONE*, 11(12): e0168984 (28 Dec 2016). [doi: 10.1371/journal.pone.0168984] [pmid: 28030620]

5. **Andrew Sundstrom**, Elda Grabocka, Dafna Bar-Sagi, Bud Mishra. "Histological image processing features induce a quantitative characterization of chronic tumor hypoxia". *PLoS ONE*, 11(4): e0153623 (19 Apr 2016). [doi: 10.1371/journal.pone.0153623] [pmid: 27093539]

4. Justin Jee, **Andrew Sundstrom**, Steven E. Massey, Bud Mishra. "What can information-asymmetric games tell us about the context of Crick's 'frozen accident'?" *Journal of the Royal Society Interface*, 10(88):20130614 (6 Nov 2013). Published ahead of print 28 Aug 2013. [doi: 10.1098/rsif.2013.0614] [pmid: 23985735]

3. **Andrew Sundstrom**, Silvio Cirrone, Salvatore Paxia, Carlin Hsueh, Rachel Kjolby, James K. Gimzewski, Jason Reed, Bud Mishra. "Image analysis and length estimation of biomolecules using AFM". *IEEE Transactions on Information Technology in Biomedicine*, 16(6):1200-1207 (Nov 2012). Published online before print 29 Jun 2012. [doi: 10.1109/TITB.2012.2206819] [pmid: 22759526]

2. Jason Reed, Carlin Hsueh, Miu-Ling Lam, Rachel Kjolby, **Andrew Sundstrom**, Bud Mishra, and James K. Gimzewski. "Identifying individual DNA species in a complex mixture by precisely measuring the spacing between nicking restriction enzymes with atomic force microscope". *Journal of the Royal Society Interface*, 9(74):2341-2350 (7 Sep 2012). Published online before print 28 Mar 2012. [doi: 10.1098/rsif.2012.0024] [pmid: 22456455]

1. Hao Wu, Kevin J. Kim, Kshama Mehta, Salvatore Paxia, **Andrew Sundstrom**, Thomas Anantharaman, Ali I. Kuraishy, Tri Doan, Jayati Ghosh, April D. Pyle, Amander Clark, William Lowry, Guoping Fan, Tim Baxter, Bud Mishra, Yi Sun, Michael A. Teitell. "Copy number variant analysis of human embryonic stem cells". *Stem Cells*, 26(6):1484-1489 (Jun 2008). Published online before print 27 Mar 2008. [doi: 10.1634/stemcells.2007-0993] [pmid: 18369100]

Patents

Methods and Systems for Measuring a Property of a Macromolecule
U.S. Patent No. 9,995,766, with Jason Reed and Bud Mishra, issued 12 Jun 2018

Invited Talks

"Simulating the cell population level effects of cancer cell metabolic reprogramming". In Edmund Clarke (Chair), symposium conducted at the meeting of the Fall 2012 CMACS PI Meeting, Stony Brook, NY, 19 Oct 2012.

Referee

- *Bioinformatics*, since 2017
- *Tissue & Cell*, since 2017
- *Royal Society Open Science*, since 2017
- *Journal of Nanoparticle Research*, since 2013
- *Molecular Cancer Therapeutics*, since 2009

Technical Reviewer

- *Mathematical Methods for Analysis of a Complex Disease*, by Frank C. Hoppensteadt. American Mathematical Society, 2011.
- *Higher Order Perl*, by Mark Jason Dominus. Morgan Kaufman, 2005.
- *Perl Best Practices*. Damian Conway. O'Reilly Media, 2005.

Grants and Fellowships

- NIH/NIGMS Toward whole-cell models for precision medicine and synthetic biology [1R35GM119771-01 Karr (PI)] (2016-2021)
- NSF INSPIRE: Systematic, scalable representation and simulation of whole-cell models [1649014 Karr (PI)] (2016-2019)
- NIH NIDA T32 Postdoctoral Research Fellowship for Interdisciplinary Training in Drug Abuse Research [T32DA007135] (2014-2017)
- NYU Henry M. MacCracken Fellowship (2008-2013)
- NSF IGERT Fellowship (2008-2011)
- Joseph G. Grossman Cornell Tradition Fellowship (1989-1993)

Honors and Awards

- Association of Computer Science Undergraduates Distinguished Service Award, 1993

Professional Experience

Icahn School of Medicine at Mount Sinai, New York, NY, USA
Assistant Professor **Sep 2017 - present**

- Icahn Institute for Genomics and Multiscale Biology

Icahn School of Medicine at Mount Sinai, New York, NY, USA
Postdoctoral Research Fellow **Sep 2014 - Sep 2017**

- Iyengar Lab, Institute for Systems Biomedicine

Courant Institute of Mathematical Sciences, New York, NY, USA
Senior Research Scientist **Aug 2013 - Aug 2014**

- RiskEcon® Lab for Decision Metrics

Cold Spring Harbor Laboratory, Cold Spring Harbor, NY, USA
Scientific Informatics Developer **Jun 2009 - Sep 2009**

- Mitra Lab: Brain Architecture Project

Courant Institute of Mathematical Sciences, New York, NY, USA
Research Scientist **Sep 2007 - May 2008**

- NYU Bioinformatics Group

Morgan Stanley, New York, NY, USA
Associate / Lead Software Engineer **Sep 1998 - Mar 2007**

- Equity Trading Lab (Jan 2006 - Mar 2007)
- Trade Surveillance and Analysis Group (Nov 2002 - Jan 2006)
- Business Intelligence Group (May 2000 - Nov 2002)
- Securities Processing Renovation Group (Sep 1998 - May 2000)

IBM Thomas J. Watson Research Center, Yorktown Heights, NY, USA
Research Associate / Senior Staff Programmer **Feb 1996 - Aug 1998**

- Exploratory Computer Vision Group
  Department of Computational Biology, Vision & Linguistics (Aug 1997 - Aug 1998)
- Language Modeling Group
  Department of Human Language Technologies (Feb 1996 - Aug 1997)

Nortel Networks, Richardson, TX, USA
Member of Scientific Staff **Jan 1994 - Jan 1996**

- Cellular Systems Research Group (Jul 1995 - Jan 1996)
- Sprint Distributed Intelligent Network Architecture Group (Jan 1994 - Jul 1995)

Prime Factors, Inc., Eugene, OR, USA
Member of Research Staff **May 1992 - Aug 1992**

- Handwritten Signature Forgery Detection Team

Professional Affiliations

- Member of the Association for Computing Machinery (ACM) since 1997
- Member of the Institute of Electrical and Electronics Engineers (IEEE) since 1997
- Member of the American Association for the Advancement of Science (AAAS) since 1999
- Member of the New York Academy of Sciences (NYAS) since 2008
- Member of the International Society for Computational Biology (ISCB) since 2017

Computer Skills

- **Programming languages:** C, C++, Common Lisp, Scheme, Perl, Python
- **Mathematics systems:** Matlab, Maple, Mathematica, R, Sage, LaTeX
- **Database systems:** DB2, MySQL, PostgreSQL, Sybase
- **Revision control systems:** git, svn, cvs, rcs

- **Operating systems:** Unix, Linux, OS X, Windows
- **Special toolkits:** ITK, OpenCV, wxWidgets, Virtual Cell, ImageJ

Artistic Activities

- Student of Gordon Wormser at Aikido of Park Slope (Brooklyn, NY), 2016–present
- Student of Nicki Orbach at the Art Students League of New York (New York, NY), 2000–2004
- Student of Ed Young in the Cheng Man-ch'ing school of t'ai chi ch'uan (Hastings-on-Hudson, NY), 1996–2000

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