

Saad Mneimneh

Hunter College
The City University of New York

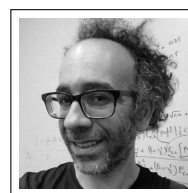
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Research Interests

My research is in network algorithms and biologically inspired computational problems, including switching, load balancing, and multiple RNA interaction. Recently, I have been shifting focus to mathematical modeling of networks and other physical/biological systems, probabilistic analysis and statistics, and discrete mathematics.

Education

2002 PhD, *Massachusetts Institute of Technology*, Cambridge MA.

1997 SM, *Massachusetts Institute of Technology*, Cambridge MA.

1995 BE, *American University of Beirut*, Beirut Lebanon.

Professional History

Summer 2022 Visiting Scholars, *CAMS and MSFEA*, American University of Beirut, Lebanon.

2018–present Associate Professor, *Computer Science*, Hunter College of CUNY, New York.

2019–2020 Fellowship leave, *Computer Science*, MIT, Cambridge MA.

2011–2018 Assistant Professor, *Computer Science*, Hunter College of CUNY, New York.

2011 Substitute Assistant Professor, *Computer Science*, Hunter College of CUNY, New York NY.

2008–present Doctoral Faculty, *Computer Science*, The Graduate Center of CUNY, New York NY.

2005–2010 Visiting Assistant Professor, *Computer Science*, Hunter College of CUNY, New York NY.

2006–2007 Consultant, *MobiLaps Inc.*, Sliver Spring MD.

2002–2005 Assistant Professor, *Computer Science*, Southern Methodist University, Dallas TX.

1996–2002 Research Assistant, *MIT*, Cambridge MA.

2001 Research Engineer, *Alcatel Inc.*, Dallas TX.

2000–2001 Athena Consultant, *MIT*, Cambridge MA.

2000 Research Engineer, *Tellabs Research Center*, Cambridge MA.

1999 Research Engineer, *Bell Labs Lucent Technologies*, Murray Hill NJ.

1995–1996 Teaching Assistant, *MIT*, Cambridge MA.

1994 Research Scholar, *MIT*, Cambridge MA.

Peer-Reviewed Publications and Presentations

- 2023 Saad Mneimneh. "Three Points Make a Right Triangle". MoMATH Conference on the Mathematics of Various Entertaining Subjects (MOVES). August 2023.
- Alexey Nikolaev and Saad Mneimneh. "Modeling and Analysis of Affiliation Networks with Preferential Attachment and Subsumption." *Phys. Rev. E* 108, 014310. July 2023..
- 2022 Saad Mneimneh. "Living on a Random Torus". MoMATH Conference on the Mathematics of Various Entertaining Subjects (MOVES). August 2022.
- Saad Mneimneh. "A Binomial Sum of Harmonic Numbers". *Elsevier Journal for Discrete Mathematics* 346(1), 2022..
- 2021 Lia Di, Saymon Akther, Edgaras Bezrucenkovas, Larisa Ivanova, Brian Sulkow, Bing Wu, Saad Mneimneh, Maria Gomes-Solecki, and Weigang Qiu. "Maximum antigen diversification in a lyme bacterial population and evolutionary strategies to overcome pathogen diversity." *The ISME Journal* pp. 1-18. August 2021..
- 2020 Saad Mneimneh. "Simple Variations on The Tower of Hanoi: A Study of Recurrences and Proofs by Induction." *Teaching Mathematics and Computer Science* 17(2), 131-158..
- 2019 Syed Ali Ahmed, Saad Mneimneh. "Gibbs/MCMC Sampling for Multiple RNA Interaction with Sub-optimal Solutions." *IEEE/ACM Transactions on Computational Biology and Bioinformatics*. 10.1109/TCBB.2018.2890519..
- 2018 Syed Ali Ahmed, Saman Farhat, and Saad Mneimneh. "Making Multiple RNA Interaction Practical." *International Conference on Combinatorial Optimization and Applications, COCOA 2018, December 2018 Atlanta, Georgia*.
- 2017 Saad Mneimneh and Syed Ali Ahmed. "Combinatorial and Probabilistic Aspects of the Multiple RNA Interaction Problem." Poster presentation in RECOMB 2017, May 2017 Hong Kong.
- Saad Mneimneh and Alexey Nikolaev. "Counting with Code." *The Journal of Computing Sciences in Colleges* 32, no. 6, June 2017, pp. 101-110 (also paper presented at CCSCNE 2017, April 2017).
- Saad Mneimneh, Suman Bhunia, Felisa Vazquez-Abad, Shamik Sengupta. "A Game-Theoretic and Stochastic Survivability Mechanism against Induced Attacks in Cognitive Radio Networks." *Journal of Pervasive and Mobile Computing*, in press.
- Alexey Nikolaev, Saad Mneimneh, Amotz Bar-Noy, Ram Ramanathan. "Controlled Growth of Simplicial Complex Networks." In 2017 IEEE Conference on Computer Communications Workshops INFOCOM WKSHPS, to appear (also poster presentation at NetSciX 2017).

2016 Radford, Jason, Amotz Barnoy, Alexey Nikolaev, Saad Mneimneh, David Lazer, and Ram Ramanathan. "Testing Higher-Order Network Structures in an Online Experiment." In Proceedings of the 19th ACM Conference on Computer Supported Cooperative Work and Social Computing Companion, pp. 377-380. ACM, 2016.

Mneimneh, Saad, and Syed Ali Ahmed. "Gibbs/MCMC Sampling for Multiple RNA Interaction with Sub-optimal Solutions." In International Conference on Algorithms for Computational Biology, pp. 78-90. Springer International Publishing, 2016.

Mneimneh, Saad and Syed Ali Ahmed. "A Sampling Approach for Multiple RNA Interaction: Finding Sub-optimal Solutions Fast." In Proceedings of the 9th International Joint Conference on Biomedical Systems and Technologies, Volume 3: BIOINFORMATICS, pp. 75-84, 2016, Rome Italy.

2015 Mneimneh, Saad, and Saman Farhat. "The Offline Carpool Problem Revisited." In International Symposium on Mathematical Foundations of Computer Science, pp. 483-492. Springer Berlin Heidelberg, 2015.

Mneimneh, Saad, and Farhat Saman. "The offline carpool problem." Paper presentation in the Cologne-Twente Workshop on Graphs and Combinatorial Optimization, Turkey, May 2015.

Mneimneh, Saad, and Syed Ali Ahmed. "Multiple RNA interaction: beyond two." IEEE transactions on nanobioscience 14, no. 2 (2015): 210-219.

Mneimneh, Saad. "Fibonacci in The Curriculum: Not Just a Bad Recurrence." Proceedings of the 46th ACM Technical Symposium on Computer Science Education, pp. 253-258, ACM, 2015.

Assarpour, Ali, Saman Farhat, Ou Liu, Alexey Nikolaev, Amotz Bar-Noy, Prithwish Basu, Saad Mneimneh, and Ram Ramanathan. "Measuring the strength of networks of teams: Metrics and properties." In 2015 IEEE Conference on Computer Communications Workshops (INFOCOM WKSHPs), pp. 414-419. IEEE, 2015.

2014 Ahmed, Syed Ali, and Saad Mneimneh. "Multiple RNA interaction with sub-optimal solutions." In International Symposium on Bioinformatics Research and Applications, pp. 149-162. Springer International Publishing, 2014.

2013 Nikolaev, Alexey, and Saad Mneimneh. "A mathematical model for secondary structure in proteins." In Bioinformatics and Bioengineering (BIBE), 2013 IEEE 13th International Conference on, pp. 1-6. IEEE, 2013.

Mneimneh, Saad, Syed Ali Ahmed, and Nancy L. Greenbaum. "Multiple RNA Interaction: Formulations, Approximations, and Heuristics." In BIOINFORMATICS, pp. 242-249, SciTePress 2013.

Ahmed, Syed Ali, Saad Mneimneh, and Nancy L. Greenbaum. "A combinatorial approach for multiple RNA interaction: formulations, approximations, and heuristics." In International Computing and Combinatorics Conference, pp. 421-433. Springer Berlin Heidelberg, 2013.

Nikolaev, Alexey, and Mneimneh, Saad. "From sequence to structure: A percolation theory approach." Paper presentation in Informs Computing Society, January 2013.

Nikolaev, Alexey, and Mneimneh, Saad. "A model of clusters in binary and ternary strings applied to protein secondary structure prediction." Paper presented in Applied Mathematics Modeling and Computational Sciences, AMMCS 2013, Canada.

2012 Mneimneh, Saad. "Crossing Over... Markov Meets Mendel." PLoS Comput Biol 8, no. 5 (2012): e1002462. <https://doi.org/10.1371/journal.pcbi.1002462>.

2011 Mneimneh, Saad. "Crossing Over: Markov Meets Mendel." Paper presentation in RECOMB-BE satellite conference on Bioinformatics Education, 2011, Vienna.

2009 Mneimneh, Saad. "On the approximation of optimal structures for RNA-RNA interaction." IEEE/ACM Transactions on Computational Biology and Bioinformatics (TCBB) 6.4 (2009): pp. 682-688.

Xianfa Xie, Juan Coronado, Saad Mneimneh, Susan Epstein, Weigang Qiu, and Peter Lipke. "On the evolution of fungal cell walls." Paper presentation in IV International Conference on Molecular Mechanisms of Fungal Cell Wall Biogenesis, Warsaw (Poland) Aug. 30th - Sep 3rd, Polish Academy of Sciences, Institute of Biochemistry and Biophysics, 2009.

2008 Mneimneh, Saad. "Matching from the first iteration: An iterative switching algorithm for an input queued switch." IEEE/ACM Transactions on Networking (TON) 16, no. 1 (2008): pp. 206-217.

2007 Coronado, Juan E., Saad Mneimneh, Susan L. Epstein, Wei-Gang Qiu, and Peter N. Lipke. "Conserved processes and lineage-specific proteins in fungal cell wall evolution." Eukaryotic cell 6, no. 12 (2007): pp. 2269-2277.

Mneimneh, Saad. "How to waste 2/3 of the throughput of a switch: a tight characterization of load balancing algorithms that do not split." In 2007 Workshop on High Performance Switching and Routing, pp. 1-5. IEEE, 2007.

2006 Mneimneh, Saad, and Franck Quessette. "Linear complexity algorithms for maximum advance deflection routing in some networks." In 2006 Workshop on High Performance Switching and Routing, pp. 127-133. IEEE, 2006.

Mneimneh, Saad. "Load balancing in a switch without buffers." In 2006 Workshop on High Performance Switching and Routing, pp. 193-200. IEEE, 2006.

- Mneimneh, Saad. "On The Approximation of Optimal Structures for RNA-RNA Interaction." Poster presentation in LSS Computational Systems Bioinformatics CSB 2006, Stanford University.
- 2004 Mneimneh, Saad. "RNA-RNA interaction is NP-complete and some approximation algorithms." SMU technical report 04-CSE-03, July 2004.
- Mneimneh, Saad. "An iterative switching algorithm with (possibly) one iteration." In Network Computing and Applications, 2004.(NCA 2004). Proceedings. Third IEEE International Symposium on, pp. 223-231. IEEE, 2004.
- 2003 Mneimneh, Saad, and Kai-Yeung Siu. "On achieving throughput in an input-queued switch." IEEE/ACM Transactions on Networking (TON) 11, no. 5 (2003): pp. 858-867.
- 2002 Mneimneh, Saad, Vishal Sharma, and Kai-Yeung Siu. "Switching using parallel input-output queued switches with no speedup." IEEE/ACM Transactions on Networking 10, no. 5 (2002): pp. 653-665.
- Mneimneh, Saad, and Kai-Yeung Siu. "Scheduling unsplittable flows using parallel switches." In Communications, 2002. ICC 2002. IEEE International Conference on, vol. 4, pp. 2410-2415. IEEE, 2002.
- Mneimneh Saad. "Algorithmic Aspects of High Speed Switching." MIT Thesis, 2002.
- 1999 Rabih Zbib, Saad Mneimneh, Judson Harward. "The Trierarch Trigger Architecture." In Proceedings of the Advanced Telecommunication and Information Distribution Research Program ATIRP (DoD/ARL), February 1999.
- 1998 Judson Harward, Albert Bailey, Issam Bazzi, Saad Mneimneh. "An Improved Hierarchical Caching Architecture for Low Bandwidth Networks." In Proceedings of the Advanced Telecommunication and Information Distribution Research Program ATIRP (DoD/ARL), February 1998.
- 1997 Mneimneh Saad, Rabih Zbib, Judson Harward. "A Generalized Data Stream Interface." In Proceedings of the Advanced Telecommunication and Information Distribution Research Program ATIRP (DoD/ARL), January 1997.

Research Funding Awards

External Agencies

- 2016–2019 Multiple RNA Interaction: Beyond Two, *PhRMA Foundation*, \$100,000, PI.
- 2011–2015 Combinatorial and Probabilistic Aspects of Biological Problems, *National Science Foundation CCF-AF 1049902*, \$200,000, PI.
- 2010–2011 Web Browser Emergency Alert System, *MobiLaps Inc.*, \$30,000, PI.

CUNY's Professional Staff Congress

- 2016–2017 RNA Interaction by Trapezoidal Tiling, *PSC CUNY Enhanced Grant ENHC-47-115*, \$12,000, PI.
- 2015–2016 Multiple RNA Interaction, *PSC CUNY Category B TRADB-46-220*, \$6,000, PI.
- 2013–2014 Why They Fold Graciously, *PSC CUNY Category B TRADB-44-332*, \$6,000, PI.

Invited Talks

- May 2024 Fibonacci-ish: Encounters of the Fibonacci Kind where you least expect them, *MoMATH, New York*.
- Jul 2022 Modeling and Analysis of Affiliation Networks with Preferential Attachment and Subsumption, *AUB CAMS, Beirut, Lebanon*.
- Jul 2022 Fibonacci-ish: Fibonacci where you least expect it, *AUB CAMS, Beirut, Lebanon*.
- Dec 2018 Chess-like games, RNA interaction, and other things, *Stuy Flash, Stuyvesant High School, New York*.
- Jan 2015 Chess, other games, and the interaction of RNAs, *MIT Quantitative Biology Workshop*.
- Oct 2014 A mathematical perspective on the evolution of secondary structures in proteins, *CUNY Graduate Center Seminar in Computer Science*.
- May 2013 Do proteins speak binary?, *CUNY Graduate Center Seminar in Statistics*.
- Feb 2010 Evolution with Bayes' rule and simple tree combinatorics, *CUNY Graduate Center Seminar in Computer Science*.
- April 2008 A tribute to Pythagoras, *York College Invited Talk*.
- Dec 2007 RNA-RNA interaction algorithms, *Workshop on Algorithms, Combinatorics, and Geometry, Denton TX*.
- Nov 2007 Some lower and upper bounds in load balancing of switches, *CUNY Graduate Center Seminar in Computer Science*.
- Oct 2006 How to waste $2/3$ of the throughput of a switch, *NYU Poly*.
- May 2006 Load balancing in a switch and three properties: throughput, reordering, and starvation, *CUNY Graduate Center Seminar in Computer Science*.
- Dec 2005 RNA-RNA interaction: formulation, NP-completeness, and approximations, *CUNY Graduate Center Seminar in Computer Science*.

Patents

- Sep 2009 Method for Providing a Web Browser Page with Inserted Tollbar or Interstitial Content, *Hisham Kassab, Saad Mneimneh, Won Yoon*, US Patent No 12/530,403, MobiLaps Inc..
- Oct 2006 High Speed Parallel Crossbar Switch, *Vishal Sharma, Saad Mneimneh*, US Patent No. 7123623, Tellabs Research Center.
- Mar 2006 Minimum Deflection Routing in Bufferless Networks, *Saad Mneimneh, Gerard Damm, Dominique Verchere, Frank Quessette*, European Patent No EP1387535, Alcatel Inc..

Synergistic Activity

- 2019 Penalist, NSF CCF on computational biology, Mitra Basu cognizant officer.
- 2018 Book reviewer, Princeton University Press.
- 2017-2019 CUNY Math Challenge committee.
- 2017 CTBR of Hunter College, Associate member.
- 2017 CCSC North East Workshop organizer.
- 2017 SIGCSE program committee.
- 2015–2017 CBMM faculty, MIT outreach program.
- 2013–2017 BIOSTEC conferences program committee.
- 2012–2017 CoSSMO Institute CUNY, Lead for outreach.
- 2010–2017 Hunter College, Computer Science, QuBi advisor.
- 2009–2017 Hunter College, QuBi committee.
- 2008–2017 Hunter College, Computer Science, curriculum committee.
- 2016 AICoB session chair.
- 2015–2016 MoMATH Integrator.
- 2009–20016 Hunter College senate.
- 2013–2015 Hunter College, Computer Science Assessment committee.
- 2014 CTBR Bioinformatics Symposium, Poster Judge.
- 2013 AMMCS session chair.
- 2002–2010 Reviewer for HPSR, SIGCOM, INFOCOM, IEEE ToN.
- 2011 Panelist, NSF CCF on computational biology, Mitra Basu cognizant officer.
- 2010 Reviwer, Fonds de Recherche sur la Nature et les Technology, Quebec.
- 2009 Book reviewer, MIT press.

Honors and Awards

- 2016–2018 PhRMA Foundation Starter Grant Award.
- 2014–2017 Hunter College, Presidential Travel Awards.
- 2014 Hunter College, William Stewart Travel Award.
- 2014 Hunter College, Presidential Faculty Advancement Award.

- 2009 Hunter College, Cecil Insdorf Presidential Award for Excellence in Teaching.
- 2000 Departmental honors, MIT doctoral qualifying exam.
- 1991–1995 American University of Beirut, Dean's honor list.
- 1991–1995 Hariri Foundation scholarship, Lebanon.
- 1991 Fifth rank, Lebanese Baccalaureate.
- 1983 Third prize, Peace competition, Lebanon.

Professional Memberships

- Institute of Electrical and Electronics Engineers (IEEE).
- Association for Computing Machinery (ACM).
- Mathematical Association of America (MAA).
- MoMATH (Museum of Mathematics), Integrator.