Niema Moshiri

CONTACT INFORMATION

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https://niema.net

EDUCATION

University of California, San Diego

Ph.D. in Bioinformatics and Systems Biology, 4.000 (expected June 2019)

- Advisors: Siavash Mirarab and Pavel Pevzner

B.S. in Bioengineering: Bioinformatics, 3.624 (June 2015)

- Minor: Economics

PUBLICATIONS

Textbooks

Moshiri N, Izhikevich L (2018). Design and Analysis of Data Structures. *Amazon KDP*. Paperback ISBN:1981017232, Kindle ASIN:B07CYM8ZWJ.

Moshiri N, Izhikevich L (2016). Data Structures. *Stepik*. https://stepik.org/course/Data-Structures-579

Papers

Moshiri N, Ragonnet-Cronin M, Wertheim JO, Mirarab S (2018). FAVITES: simultaneous simulation of transmission networks, phylogenetic trees, and sequences. *Bioinformatics (In Press)*. Preprint doi:10.1101/297267

Moshiri N, Mirarab S (2017). A Two-State Model of Tree Evolution and its Applications to *Alu* Retrotransposition. *Systematic Biology*. 67(3), 475-489. doi:10.1093/sysbio/syx088

Preprints

Moshiri N (2018). The dual-Barabási-Albert model. *arXiv*:1810.10538

Rule A, Birmingham A, Zuniga C, Altintas I, Huang SC, Knight R, **Moshiri N**, Nguyen M, Rosenthal SB, Perez F, Rose P (2018). Ten Simple Rules for Reproducible Research in Jupyter Notebooks. *arXiv*:1810.08055

Moshiri N (2018). TreeN93: a non-parametric distance-based method for inferring viral transmission clusters. *bioRxiv*. doi:10.1101/383190

Moshiri N (2018). TreeSwift: a massively scalable Python package for trees. *bioRxiv*. doi:10.1101/325522

Moshiri N (2018). TreeCluster: Massively scalable transmission clustering using phylogenetic trees. *bioRxiv*. doi:10.1101/261354

Moshiri N (2017). A linear-time algorithm to sample the dual-birth model. *bioRxiv*. doi:10.1101/226423

ONLINE COURSES

Analyze Your Genome! (UC San Diego & edX, 2017 to Present)

Bioinformatics Algorithms (UC San Diego & Coursera, 2015 to Present)

Data Structures: An Active Learning Approach (UC San Diego & edX, 2018 to Present)

Introduction to Genomic Data Science (UC San Diego & edX, 2017 to Present)

Software

FAVITES: Simulate viral transmission, phylogenetic trees, and sequences
https://github.com/niemasd/FAVITES

TreeCluster: Infer transmission clusters from viral phylogenies
https://github.com/niemasd/TreeCluster

TreeN93: Infer transmission clusters non-parametrically from TN93 distances
https://github.com/niemasd/TreeN93

TreeSAP: Simulate trees under various phylogenetic models
https://github.com/niemasd/TreeSAP

TreeSwift: Parse, manipulate, and iterate over ultra-large tree structures
https://github.com/niemasd/TreeSwift

Honors and Awards

Mar 2017	*Distinguished Teaching Award* UC San Diego Academic Senate
Jun 2015	*Distinguished Leadership/Service Award* UC San Diego Bioengineering Department
2011–2015	*Thurgood Marshall College Honors Program* Thurgood Marshall College, UC San Diego
2011–2015	*Provost Honors* University of California, San Diego

Conference Awards

Aug 2018	*Travel Fellowship* Future of Algorithms in Biology (FAB) 2018 Carnegie Mellon University
Jul 2018	*Registration Award* CSHL Biological Data Science Meeting 2018
Apr 2018	*Registration and Travel Awards* International AIDS Conference (AIDS) 2018
Mar 2018	*Young Investigator Travel Award* Society of Molecular Biology and Evolution (SMBE) 2018
Sep 2017	*1st Place Flash Talk* UC San Diego Bioinformatics Exchange (BEx) 2018
Mar 2017	*Registration Award* Society of Molecular Biology and Evolution (SMBE) 2017

Invited Talks

Oct 2018	*Massively scalable tools for the analysis of viral epidemics* Temple University Institute for Genomics and Evolutionary Medicine (iGEM) Seminar
Apr 2018	*Standardized Environments using JupyterHub* Reproducible Research and Interactive Education Meeting Data Science Hub at the San Diego Supercomputer Center
Jun 2017	*The Era of Online Learning* TEDxUCSD 2017, https://youtu.be/5JKgUoY9pTg

Conference Presentations

Nov 2018	*Flipping computational courses using Massive Adaptive Interactive Texts* CSHL Biological Data Science Meeting 2018
Sep 2018	*Open Computational Problems in HIV Epidemiology* Future of Algorithms in Biology (FAB) 2018
Aug 2018	*Challenges and Guidelines for Reproducible Research with Jupyter Notebook* JupyterCon 2018
Jul 2018	*FAVITES: a framework for the simulation of compatible viral transmission networks, phylogenetic trees, and sequences* International AIDS Conference (AIDS) 2018
Jul 2018	*FAVITES: simultaneous simulation of transmission networks, phylogenetic trees, and sequences* Society of Molecular Biology and Evolution (SMBE) 2018
Apr 2018	*FAVITES: simultaneous simulation of transmission networks, phylogenetic trees, and sequences* 25th International HIV Dynamics & Evolution
Jul 2017	*Using Online Classes to Flip Bioinformatics Classrooms* International Society for Computational Biology (ISMB) 2017
Jul 2017	*A two-state model of tree evolution and its applications to* Alu *retrotransposition* Society of Molecular Biology and Evolution (SMBE) 2017

Campus Talks

Sep 2018	*Bioinformatics Expo (BEx) 2018* Bioinformatics and Systems Biology Program, UC San Diego
Sep 2018	*Bioinformatics and Systems Biology Boot Camp 2018* Bioinformatics and Systems Biology Program, UC San Diego
Jun 2018	*Bioinformatics Industry + Academia Symposium 2018* Undergraduate Bioinformatics Club (UBIC) at UC San Diego
Apr 2018	*The Bioengineering Experience 2018* Biomedical Engineering Society (BMES) at UC San Diego
Jan 2018	*Bioinformatics Podcast* Undergraduate Bioinformatics Club (UBIC) at UC San Diego
Sep 2017	*Bioinformatics Expo (BEX) 2017* Bioinformatics and Systems Biology Program, UC San Diego
May 2017	*Bioinformatics Industry + Academia Symposium 2017* Undergraduate Bioinformatics Club (UBIC) at UC San Diego
April 2017	*Population and Medical Genetics Seminar* Bioinformatics and Systems Biology Program, UC San Diego
May 2016	*Bioinformatics Industry + Academia Symposium 2016* Undergraduate Bioinformatics Club (UBIC) at UC San Diego
May 2015	*Bioinformatics Industry + Academia Symposium 2015* Undergraduate Bioinformatics Club (UBIC) at UC San Diego

Teaching Experience

Computer Science

Advanced Data Structures
Instructor (Summer 2017)
Teaching Assistant (Winter 2016, Spring 2016)

Basic Data Structures and Object-Oriented Design
Teaching Assistant (Summer 2013, Fall 2013)

Design and Analysis of Algorithms
Teaching Assistant (Fall 2014)

Introduction to Computer Science: Java (I)
Teaching Assistant (Fall 2013, Winter 2014)

Introduction to Computer Science: Java (II)
Teaching Assistant (Spring 2014)

Bioinformatics

Advanced Bioinformatics Laboratory
Teaching Assistant (Spring 2017)

Biological Databases
Teaching Assistant (Spring 2016)

Biology Meets Computing
Instructor (Fall 2016)

Current Issues in Bioinformatics
Teaching Assistant (Spring 2016)

Introduction to Bioinformatics (Academic Connections, UCSD Extension)
Instructor (Summer 2016)

Introduction to Bioinformatics Algorithms
Teaching Assistant (Winter 2016)

Molecular Sequence Analysis
Teaching Assistant (Winter 2016)

Biology

Genetics
Teaching Assistant (Winter 2014, Spring 2014, Fall 2014, Spring 2015)

Economics

International Trade
Teaching Assistant (Spring 2014)

Principles of Microeconomics
Teaching Assistant (Summer 2014)

Reviewer

Journals

F1000Research

Conferences

ACM Global Computing Education Conference (CompEd) 2019

Consortium for Computing Sciences in Colleges, Southwest (CCSCSW) 2019

Special Interest Group on Computer Science Education (SIGCSE) 2019

Research Experience

2016–2019	*Mathematical modeling of viral evolution and epidemiology* UC San Diego CSE and ECE Departments Advisors: Siavash Mirarab and Pavel Pevzner
2015–2016	*Variant analysis in neurological disease* UC San Diego School of Medicine Advisor: Joe Gleeson
2015–2016	*Viral integration and structural variation in cancer* UC San Diego CSE Department Advisor: Vineet Bafna
2014–2016	*Computational genomics in disease* Scripps Institute of Oceanography, UC San Diego Advisor: Terry Gaasterland
2013	*Protein structure prediction via Direct Coupling Analysis* Skaggs School of Pharmacy, UC San Diego Advisors: Andreas Prlić and Phil Bourne
2012	*Protein structure annotation in PyMOL* UC San Diego Chemistry Department Advisor: Sara Nichols and Andrew McCammon

Outreach

2018–2019	*STEMTaught Author* STEMTaught
2018–2019	*Skype a Scientist Volunteer* Skype a Scientist
2017–2019	*Group Mentor* Women in Computing (WIC) at UCSD
2017–2019	*SciChats@Salk Volunteer* Salk Institute for Biological Studies
2017–2019	*SalkEducation Volunteer* Salk Institute for Biological Studies
2016–2019	*Mentor Teaching Assistant* UCSD Computer Science and Engineering Department
Oct 2018	*Park Clean-Up Volunteer* San Jose Dept. of Parks, Recreation & Neighborhood Services
Sep 2018	*eMENTOR* Del Lago Academy
Oct 2017	*Protein Modeling Project Mentor* Mission Bay High School
Apr 2015	*High School Outreach Event Organizer and Volunteer* Undergraduate Bioinformatics Club (UBIC) at UC San Diego
Feb 2015	*Envision Volunteer* Society of Women Engineers (SWE) at UCSD

Professional Organizations

2018–2020 *American Go Association (AGA)*
2018–2020 Member

2018–2020 *International AIDS Society (IAS)*
2018–2020 Member

2017–2019 *International Society of Computational Biology (ISCB)*
2017–2019 Fundraising Committee Member

2017–2019 *Society of Molecular Biology and Evolution (SMBE)*
2017–2019 Member

2017–2019 *Special Interest Group on Computer Science Education (SIGCSE)*
2017–2019 Member

University Organizations

2018–2019 *CS foreach at UCSD*
2018–2019 Member

2017–2019 *Graduate Women in Computing (GradWIC) at UCSD*
2017–2018 Outreach Committee Member

2015–2019 *Graduate Bioinformatics Council (GBIC) at UCSD*
2018–2019 President
2017–2018 Director of Onboarding
2016–2017 Director of Finance
2015–2016 Director of Internal

2013–2019 *Women in Computing (WIC) at UCSD*
2015–2019 Group Mentor
2013–2015 Member

2014–2015 *Engineering World Health (EWH) at UCSD*
2014–2015 Member

2013–2015 *Society of Women Engineers (SWE) at UCSD*
2013–2015 Member

2012–2015 *Undergraduate Bioinformatics Club (UBIC) at UCSD*
2014–2015 President
2013–2014 Administrative Officer