

Douglas Michael Densmore
Boston University
Department of Electrical and Computer Engineering
610 Commonwealth Ave., Rm 403
Boston, MA 02215 USA

510-434-4978 (Phone)
617-353-7337 (Fax)
dougATbuDOTedu
http://www.ddensmore.net
US Citizen

Professional Appointments

- **Boston University** Boston, Massachusetts USA
 - *Associate Professor in the Department of Electrical and Computer Engineering* 9/15 - Present
 - *Assistant Professor in the Department of Electrical and Computer Engineering* 9/10 - 9/15
 - *Founding Faculty Biological Design Center (BDC)* 2015 - Present
 - Affiliated Faculty in the Department of Biomedical Engineering, Bioinformatics, and MCBB
 - Engineering Biology Research Consortium (EBRC) Affiliated Investigator
 - Head of the Cross-disciplinary Integration of Design Automation Research (www.cidarlab.org) group
 - Head of the “Design, Automation, Manufacturing, and Prototyping” (DAMP) Lab (www.damplab.org)
 - Developing tools for the specification, design, and assembly of synthetic biological systems and microfluidics using electronic design automation based techniques.
- **Joint BioEnergy Institute (JBEI)** Emeryville, California USA
 - *Synthetic Biology Engineering Research Center (SynBERC) Postdoctoral Fellow* 9/09 - 6/10
- **University of California, Berkeley** Berkeley, California USA
 - *UC Chancellor’s Postdoctoral Fellow* 5/07 - 9/09

Education

- **University of California, Berkeley** Berkeley, California USA
 - *Ph.D., Electrical Engineering* 9/01 - 5/07
 - **Thesis:** “A Design Flow for the Development, Characterization, and Refinement of System Level Architectural Services”
 - **Advisor:** Prof. Alberto Sangiovanni-Vincentelli
- **University of California, Berkeley** Berkeley, California USA
 - *M.S., Electrical Engineering* 9/01 - 5/04
 - **Thesis:** “Platform Based Reconfigurable Architecture Exploration Via Boolean Constraints”
 - **Thesis Committee:** Prof. Alberto Sangiovanni-Vincentelli and Prof. John Wawrzynek
- **University of Michigan** Ann Arbor, Michigan USA
 - *B.S.E., Computer Engineering* 8/96 - 4/01

Recognition

Awards

- **American Institute for Medical and Biological Engineering (AIMBE) Fellow 2021**
- Northeast Faculty Leadership Program 2020
- **Inaugural Design Automation Conference Under-40 Innovator 2017**
- National Academy of Science (NAS) Synthetic Biology Study Committee Member 2017
- Hariri Institute Faculty Fellow 2016
- ACM Senior Member 2015
- IEEE Senior Member 2014
- Kern Faculty Fellow 2014
- National Academy of Engineering (NAE) U.S. Frontiers of Engineering Symposium Participant 2013
- Boston University Ignition Award
- Boston University College of Engineering Early Career Research Excellence Award

- **NSF Faculty Early Career Development (CAREER) Award 2013**
- Hariri Institute for Computing and Computational Science and Engineering Junior Faculty Fellow 2012-2014
- Boston University Dean’s Catalyst Award 2012
- **Boston University ECE Award for Excellence in Teaching 2012**
- Richard and Minda Reidy Family Career Professor 2010-2013
- International Genetically Engineered Machine Competition “Best Hardware” 2017
- International Genetically Engineered Machine Competition “Best Software” 2008, 2009, 2011
- International Genetically Engineered Machine Competition Gold Medals 2008-9, 2011-14, 2016-18
- **Eagle Scout Award** - Boy Scouts of America

Fellowships

- University of California Chancellor’s Postdoctoral Fellowship 2007-2009
- Intel Foundation PhD Fellowship 2006-2007
- Intel Masters Award Program (IMAP) Fellowship 2001-2004
- GEM Fellowship with Intel Corporation sponsorship 2001
- Scholar Recognition Award (full tuition) - University of Michigan 1996-2001
- Martin Luther King Alumni Scholarship - University of Michigan 1996

Grants and Contracts

Funding Summary^{*+} including PI and Co-PI Awards

Status	Count	Budget	BU Exclusive
Proposed	40	\$27,503,320.92	
Pending	4	\$4,013,925.00	
Awarded	28	\$21,965,401.56	\$21,965,401.56 (100%)
Additional	25	\$19,496,031.40	\$10,113,179.40 (52%)
Total Received		\$41,461,432.96	\$32,078,580.96 (77%)

*From BU OSP from September 2010 to March 2021

+May be missing Co-PI and MED Campus Information

Primary Grants

1. Pending Grants (3)

- Lead PI:** *STEM Pathways Enhanced Biotechnology High School Outreach Program, National Defense Education Program (NDEP)*, \$1.5M, 2022-2025 **IN SUBMISSION**
- Co-PI:** *Collaborative Research: Model-guided Design of Bacterial Interspecies Interactions and Trans-organismic Communication in Living Intercellular Circuits, National Science Foundation*, \$1.2M, 2021-2024 **IN REVIEW**
- Sole PI:** *Design Automation of Microfluidic Screening for Novel Environmental Biosensor Discovery, Office of Naval Research*, \$184K, 2021 **IN REVIEW**

2. Current Grants (4)

- Lead PI:** *SemiSynBio-II: Hybrid Bio-Electronic Microfluidic Memory Arrays for Large Scale Testing and Remote Deployment, National Science Foundation*, \$1.5M total, 2020-2023.
- Sole PI:** *NSF Convergence Accelerator: Workshop for the Development of Infrastructure for Distributed Bio-Manufacturing and Bio-Readiness, National Science Foundation*, \$34K, 2020-2021
- Co-PI:** *Genetic Circuit Design for Extreme Environments Enabled by Models Extracted from Petabyte+ Perturbation Analyses, DARPA SDS2 Program*, \$1.6M, 2017-2021.
- Lead PI:** *Collaborative Research: Evolvable Living Computing - Understanding and Quantifying Synthetic Biological Systems’ Applicability, Performance, and Limits, National Science Foundation Expeditions in Computing*, \$10M, 2015-2020. **Largest NSF Computer Science Award**

3. Completed Grants (15+)

- (a) **Co-PI:** *The MIT-Broad Foundry TA2, DARPA 1000 Molecules Program*, \$850K, 2015-2020.
- (b) **Co-PI:** *CPS Frontier: Collaborative Research: BioCPS for Engineering Living Cells*, **National Science Foundation**, \$1.6M 2015-2019.
- (c) **Sole PI:** *Computational Synthetic Biological Microfluidics*, **Hariri Institute for Computing**, \$33K, 2014.
- (d) **Sole PI:** *iCorps: Lattice Automation High Throughput DNA Cloning Solutions*, **National Science Foundation iCorps Program**, \$5K, 2013 - 2014.
- (e) **Sole PI:** *Commercializing High Throughput, Combinatorial, Constraint-based DNA Cloning Using Clotho*, **BU Ignition Award**, \$50K, 2013.
- (f) **Sole PI:** *Design Automation Infrastructure for DNA Assembly in Synthetic Biology*, **National Science Foundation, NSF CAREER Award**, \$912K, 2013-2018.
- (g) **Sole PI:** *Microfluidic Biocomputing: Large-Scale Biofluidic Circuits for Programmable Logic Devices*, **BU Dean's Catalyst Award**, \$35K, 2012 - 2013.
- (h) **Sole PI:** *International Workshop on Bio-Design Automation (IWBDA)*, **National Science Foundation**, \$80K, 2012-2020. **Awarded Eight Times**
- (i) **Sole PI:** *Flow Cytometry Machinery to Enable Characterization Driven Synthetic Biology Software Design Flow*, **Office of Naval Research**, \$420K, 2012 - 2013.
- (j) **Co-PI:** *Establishment of an MIT Foundry for Massively Multi-Part System Engineering*, **DARPA Living Foundries Program**, \$250K, (BU portion), 2012 - 2014.
- (k) **Lead PI:** *Collaborative Research: ABI Development: A Modular, Community Based Design Platform for Synthetic Biology (Clotho)*, **National Science Foundation**, \$1.2M (BU portion), 2012-2015. **Outstanding designation (top 7% of 229+ submissions).**
- (l) **Sole PI:** *Augmenting and Extending the Eugene Domain Specific Language for Synthetic Biology*, **Agilent Applications and Core Technology University Research (ACT-UR) Funding**, \$57K, 2012 + \$40K 2013. **Twice Awarded**
- (m) **Co-PI:** *Utilizing Synthetic Biology to Create Programmable Micro-Bio-Robots*, **Office of Naval Research MURI** \$7.5M, 2013-2017.
- (n) **Co-PI:** *Multi-input, Multimodal, Mammalian Information Processing Circuits*, **DARPA Controlling Cellular Machinery Program**, \$4.2M, 2011-2015.
- (o) **Co-PI:** *A Tool-Chain to Accelerate Synthetic Biological Engineering (TASBE)*, **DARPA**, \$1M, 2010-2011.

Publications - available at <https://www.cidarlab.org/publications>

h-index = 29, total citations = 3572 (Google Scholar, March 2021)

BOOKS

1. Heinz Koeppl, **Douglas Densmore**, Mario di Bernardo, Gianluca Setti (editors), *Design and Analysis of Bio-Molecular Circuits*, Springer Books, **ISBN: 978-1-4419-6765-7**, 2011.
2. **Douglas Densmore**, Abhijit Davare, *A Platform-Based Design Methodology for the Electronic System Level: Frameworks, Design Flows, and Case Studies*, VDM Verlag Dr. Mueller, **ISBN: 3836473143**, 2008.

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3. Evan Appleton, Curtis Madsen, Nicholas Roehner, **Douglas Densmore**, *Design Automation in Synthetic Biology*, Cold Spring Harbor Perspectives in Biology, **PMID 28246188**, p. a023978, 2017.

4. Felice Balarin, Massimiliano D'Angelo, Abhijit Davare, **Douglas Densmore**, Trevor Meyerowitz, Roberto Passerone, Alessandro Pinto, Alberto Sangiovanni-Vincentelli, Alena Simalatsar, Yosinori Watanabe, Guang Yang, Qi Zhu, *Platform-Based Design and Frameworks: Metropolis and Metro II*, Model-Based Design of Heterogeneous Embedded Systems, Gabriela Nicolescu, Pieter Mosterman (Eds.), CRC Press, **ISBN: 9781420067842**, 2009.
5. **Douglas Densmore**, Adam Donlin, Alberto Sangiovanni-Vincentelli, *Programmable Platform Characterization for System Level Performance Analysis*, Platform Based Design at the Electronic System Level, Mark Burton and Adam Morawiec (Eds.), Springer Books, **ISBN: 1402051379**, 2006, pg. 13-30.

JOURNAL ARTICLES

6. Timothy Jones, Chris Myers, Christopher A. Voigt, **Douglas Densmore**, *Genetic Circuit Design Automation with Cello 2.0*, Nature Protocols, **In Submission**.
7. Prashant Vaidyanathan, Evan Appleton, David Tran, Alexander Vahid, George Church, **Douglas Densmore**, *Algorithms for the Selection of Fluorescent Reporters*, Communications Biology, to appear 2020. **PMID: TBD**.
8. Ali Lashkaripour , Christopher Rodriguez , Noushin Mehdipour , Rizki Mardian , David McIntyre , Luis Ortiz , Joshua Campbell, **Douglas Densmore**, *Machine Learning Enables Design Automation of Microfluidic Flow-Focusing Droplet Generation*, Nature Communications, 12, Article number: 25, 2021. **PMID: 33397940**
9. David McIntyre, Ali Lashkaripour, **Douglas Densmore**, *Rapid and Inexpensive Microfluidic Electrode Integration with Conductive Ink*, Lab on a Chip, 2020. **PMID: 32895672**
10. Ye Chen, Shuyi Zhang, Eric M. Young, Timothy S. Jones, **Douglas Densmore**, Christopher A. Voigt, *Genetic Circuit Design Automation for Yeast*, Nature Microbiology, 2020. **PMID: 32747797**
11. Joshua Timmons, **Douglas Densmore**, *Repository-based Plasmid Design*,. PLOS ONE 15(1): e0223935, 2020. **PMID: 31917791**
12. Tramy Nguyen, Timothy Jones, Pedro Fontanarrosa, Jeanet V. Mante, Zach Zundel, **Douglas Densmore**, Chris Myers, *Design of Asynchronous Genetic Circuits*, in Proceedings of the IEEE, vol. 107, no. 7, pp. 1356-1368, July 2019.
13. Radhakrishna Sanka, Joshua Lippai, Dinithi Samarasekera, Sarah Nemsick, Dylan Samperi, **Douglas Densmore**, *3DuF - Interactive Design Environment for Continuous Flow Microfluidic Devices*, Nature Scientific Reports, 2019. **PMID: 31235804**
14. David Walsh III, et. al, Peter Carr, **Douglas Densmore**, *Standardizing Automated DNA Assembly: Best Practices, Metrics, and Protocols Using Robots*, SLAS Technology, 2019. **PMID: 30768372**
15. Ali Lashkaripour, Christopher Rodriguez, Luis Ortiz, **Douglas Densmore**, *Performance Tuning of Microfluidic Flow-Focusing Droplet Generators*, Lab on a Chip, vol. 19, iss. 6, p. 1041-1053, 2019. **PMID: 30762047**
16. Tyler E. Wagner, Jacob R. Becraft, Katie Bodner, Brian Teague, Xin Zhang, Amanda Woo, Ely Porter, Bremy Albuquerque, Brian Dobosh, Oliwia Andries, Niek N. Sanders, Jacob Beal, **Douglas Densmore**, Tasuku Kitada, Ron Weiss , *Small-molecule-based regulation of RNA-delivered circuits in mammalian cells*, Nature Chemical Biology, vol. 14, p. 1043-1050, 2018. **PMID: 30327560**
17. Ali Lashkaripour, Masoud Goharimanesh, Ali Abouei Mehrizic, **Douglas Densmore**, *An adaptive neural-fuzzy approach for microfluidic droplet size prediction*, Microelectronics Journal, vol. 78, p. 73-80, 2018.
18. Göksel Misirli, Tramy Nguyen, James Alastair McLaughlin, Prashant Vaidyanathan, Timothy S. Jones, **Douglas Densmore**, Chris Myers, and Anil Wipat, *A computational workflow for the automated generation of models of genetic designs*, ACS Synthetic Biology, 2018. **PMID: 29782151**

19. Ali Lashkaripour, Ryan Silva, **Douglas Densmore**, *Desktop Micromilled Microfluidics*, *Microfluidics and Nanofluidics*, vol. 22, iss. 3, p. 31, 2018.
20. Ryan Silva, P. Dow, Ryan Dubay, C. Lissandrello, Jason Holder, **Douglas Densmore**, and Jason Fiering, *Rapid prototyping and parametric optimization of plastic acoustofluidic devices for blood–bacteria separation*, *Biomedical Microdevices*, vol. 19, iss. 3, p. 70, 2017. **PMID 28779375**
21. Evan Appleton, **Douglas Densmore**, Curtis Madsen, Nicholas Roehner, *Needs and opportunities in bio-design automation: four areas for focus*, *Current Opinion in Chemical Biology*, vol. 40, pp. 111-118, 2017. **PMID 28923279**
22. Swapnil Bhatia, Micheal J. Smanski, Christopher A. Voigt, **Douglas Densmore**, *Genetic Design Via Combinatorial Constraint Specification*, *ACS Synthetic Biology*, 2017. **PMID 28874044**
23. Luis Ortiz, et.al, **Douglas Densmore**, *Automated Liquid Handling Assembly of Modular DNA Devices*, *Journal of Visualized Experiments (JoVE)*, 2017.
24. Swati Carr, Jacob Beal, **Douglas Densmore**, *Reducing DNA Context Dependence in Bacterial Promoters*, *PLoS One*, vol. 12, iss. 4, 2017. **PMID 28422998**
25. Lauren Woodruff, Thomas E. Gorochowski, Nicholas Roehner, Tarjei S. Mikkelsen, **Douglas Densmore**, D. Benjamin Gordon, Rob Nicol, and Christopher A. Voigt, *Registry in a Tube: Multiplexed Pools of Retrievable Parts for Genetic Design Space Exploration*, *Nucleic Acids Research*, vol. 45, iss. 3, p. 1553, 2017. **PMID: 28007941**
26. Ryan Silva, Swapnil Bhatia, **Douglas Densmore**, *A Reconfigurable Continuous-flow Fluidic Routing Fabric Using a Modular, Scalable Primitive*, *Lab on a Chip*, 2016. **PMID: 27345339**
27. Nicholas Roehner, Eric Young, Christopher Voigt, D. Benjamin Gordon, **Douglas Densmore**, *Double Dutch: A Tool for Designing Combinatorial Libraries of Biological Systems*, *ACS Synthetic Biology*, 2016. **PMID: 27110633**
28. Michael Quintin, Natalie Ma, Samir Ahmed, Swapnil Bhatia, Aaron Lewis, Farren Isaacs, **Douglas Densmore**, *Merlin: Computer-Aided Oligonucleotide Design for Large Scale Genome Engineering with MAGE*, *ACS Synthetic Biology*, 2016. **PMID: 27054880**
29. Swapnil Bhatia, Craig LaBoda, Vanessa Yanez, Traci Haddock, **Douglas Densmore**, *Permutation Machines*, *ACS Synthetic Biology*, 2016. **PMID 27383067**
30. Nicholas Roehner, [et. al], **Douglas Densmore**, John Gennari, Anil Wipat, Herbert Sauro; Chris Myers, *Synthetic Biology Open Language 2.0: Sharing Structure and Function in Biological Design*, *ACS Synthetic Biology*, 2016. **PMID: 27111421**
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32. Sonya Iverson, Traci Haddock, Jacob Beal, and **Douglas Densmore**, *CIDAR MoClo: Improved MoClo Assembly Standard and New E.Coli Part Library Enables Rapid Combinatorial Design for Synthetic and Traditional Biology*, *ACS Synthetic Biology*, iss. 15, p. 99-103, 2015. **PMID: 26479688**
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34. Jacob Beal, Tyler E. Wagner, Tasuku Kitada, Odisse Azizgolshani, Jordan Moberg Parker, **Douglas Densmore**, Ron Weiss, *Model-driven Engineering of Gene Expression from RNA Replicons*, *ACS Synthetic Biology*, 2015, 4 (1), pp 48–56. **PMID: 24877739**
35. Haiyao Huang, **Douglas Densmore**, *Integration of Microfluidics into the Synthetic Biology Design Flow*, *RSC Lab on a Chip*, vol. 14, iss. 18, pp. 3459-3474, 2014. **PMID 25012162**
36. Haiyao Huang, **Douglas Densmore**, *Fluigi: Microfluidic Device Synthesis for Synthetic Biology*, *ACM Journal on Emerging Technologies in Computing Systems (JETC)*, vol. 11, iss. 3, p. 26:1–26:19, 2014.

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42. Michal Galdzicki, **Douglas Densmore**, Herbert Sauro, (+ 16 others), *The Synthetic Biology Open Language (SBOL) provides a community standard for communicating designs in synthetic biology*, Nature Biotechnology, 2014. **PMID: 24911500**
43. **Douglas Densmore**, Swapnil Bhatia, *Bio-Design Automation: Software + Biology + Robots*, Trends in Biotechnology, 22 November 2013. **PMID: 24269087**
44. Swapnil Bhatia, **Douglas Densmore**, *Pigeon: a schematic visualizer for synthetic biology*, ACS Synthetic Biology, 2013. **PMID: 23654259**
45. Mariana Leguia, Jennifer Brophy, **Douglas Densmore**, Angel Asante and J. Christopher Anderson, *2ab Assembly: A Methodology for Automatable, High-throughput Assembly of Standard Biological Parts*, Journal of Biological Engineering, 7:2, 2013. **PMID: 23305072**. *Highly accessed*.
46. Abhijit Davare, **Douglas Densmore**, Lianpeng Guo, Roberto Passerone, Alberto L. Sangiovanni-Vincentelli, Alena Simalatsar, Qi Zhu, *MetroII: A Design Environment for Cyber-Physical Systems*, ACM Transactions on Embedded Computing Systems, Volume 12, Issue 1, March 2013.
47. Jacob Beal, Ron Weiss, **Douglas Densmore**, Aaron Adler, Evan Appleton, Jonathan Babb, Swapnil Bhatia, Noah Davidsohn, Traci Haddock, Joseph Loyall, Richard Schantz, Viktor Vasilev, and Fusun Yaman, *An End-to-End Workflow for Engineering of Biological Circuits from High-Level Specifications*, ACS Synthetic Biology, 2012 (8), 317-331. **PMID: 23651286**
48. Fusun Yaman, Swapnil Bhatia, Aaron Adler, **Douglas Densmore**, Jake Beal, *Automated Selection of Synthetic Biological Parts for Genetic Regulatory Networks*, ACS Synthetic Biology, 2012 1 (8), 332-344. **PMID: 23651287**
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50. Joanna Chen, **Douglas Densmore**, Timothy S. Ham, Jay D. Keasling, and Nathan J. Hillson, *DeviceEditor Biological CAD Canvas*, Journal of Biological Engineering, 6:1, February 28th, 2012. **PMID: 22373390**
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52. Mariana Leguia, Jennifer Brophy, **Douglas Densmore** and J. Christopher Anderson, *Automated Assembly of Standard Biological Parts*, Methods in Enzymology, Volume 498, 2011. **PMID: 21601686**
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80. Adam Donlin, **Douglas Densmore**, *Method and Apparatus for Precharacterizing Systems for Use in System Level Design of Integrated Circuits*, Issued Aug 31, 2010, **Patent Number 7,788,625.**

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81. **Douglas Densmore**, *Bio-Design Automation: No One Said This Would Be Easy*, ACS Synthetic Biology, 2012 1 (8), 296-296. **PMID: 23651283**
82. **Douglas Densmore**, Soha Hassoun, *Guest Editors' Introduction: Synthetic Biology*, IEEE Design and Test of Computers 29(3): 5-6 (2012).

83. Jean Peccoud, J. Christopher Anderson, Deepak Chandran, **Douglas Densmore**, Michal Galdzicki, Matthew W Lux, Cesar A Rodriguez, Guy-Bart Stan, and Herbert M Sauro, *Essential information for synthetic DNA sequences*, Nature Biotechnology, Volume: 29, Page: 22 Year published: 2011. **PMID: 21221092**
84. John Wang, Bing Xia, Terry Johnson, **Douglas Densmore**, J. Christopher Anderson, *Swiss Army Bacteria and Mythical Software*, California Engineer, Volume 88, Issue 2, Winter 2009, pg. 11-17.
85. **Douglas Densmore**, Alberto Sangiovanni-Vincentelli, Adam Donlin, *Leveraging Programmability in Electronic System Level Designs*, Xcell Journal, Q1-2006, Issue 56, pg. 29-31.

Teaching

- Boston University, EK 100 - Freshman Advising Seminar (2012, 2013, 2020)
- Boston University, EC 311 - Introduction to Digital Logic Design - 2x - **(4.34/5 instructor rating)**
- Boston University, EC 551 - Advanced Digital Design with Verilog and FPGAs - 5x - **(4.36/5 instr. rating)**
- Boston University, EC 327 - Introduction to Software Engineering - 8x - **(4.24/5 instructor rating)**
- Boston University, EC/BE 552 - Computational Synthetic Biology for Engineers - 4x - **(4.28/5 instr. rating)**

Tools

- Knox - Repository and Revision System for Genetic Design Spaces - knoxcad.org/
- Constellation - Genetic Design Space Sandbox - constellationcad.org/
- DAFD - Design Automation for Droplet Generators - dafdcad.org/
- 3Duf - CAD Canvas for Creating Microfluidics - www.3duf.org
- Phoenix - Temporal Logic Specification of Genetic Circuits - www.phoenixcad.org
- Clotho - Store, Exchange, and Interact with Synthetic Biological Data - www.clothocad.org
- Eugene - A Domain-Specific Language for Biological Device Design - www.eugenecad.org
- Raven - DNA Assembly Planning for Binary and Multi-way Assembly Strategies - raven.cidarlab.org
- Cello - Genetic Circuit Compiler - www.cellocad.org
- Pigeon - A Text-to-Image Generator for Synthetic Biological Devices - pigeon.cidarlab.org
- Owl - Automatically Build Synthetic Biology Datasheets - owl.cidarlab.org
- Double Dutch - Design of Experiments for Synthetic Biology - doubledutch.cidarlab.org
- Merlin - Oligo Design for Genome Engineering (e.g. MAGE) - merlin.cidarlab.org

Professional Activities and Service

Board of Directors

- BioSens8, Inc. (www.biosens8.com) - Co-Founder (2020-Present)
- Asimov, Inc. (www.asimov.io) - Co-Founder (2017-Present)
- Lattice Automation, Inc. (www.latticeautomation.com) - Co-Founder, President (2013-Present)
- Joint Genome Institute (JGI) DNA Synthesis Science Program Scientific Advisory Board (2020-Present)
- Bio-Design Automation Consortium (BDAC) - Co-founder, President (2012-Present)
- Nona Research Foundation (www.nonasoftare.org) - Founder, President (2012-Present)

Consultant Positions

- Machina.Bio, San Francisco, CA
- Genomatica, San Diego, CA
- Life Technologies, Carlsbad, CA

Conference/Workshop Organization

- NSF Convergence Accelerator: Workshop for the Development of Infrastructure for Distributed Bio-Manufacturing and Bio-Readiness 2020 - **Chair**
- International Workshop on Bio-Design Automation (IWBDA) 2009-21 - **General Chair, Secretary, Co-Founder, and Steering Committee**
- Synthetic Biology: Engineering, Evolution & Design (SEED) 2015, 2016 - **Organizing Committee**
- BioCom²: NSF Workshop on Biological Computations and Communications 2012 - **Co-organizer**
- Special Interest Group for ISMB2012 (“Biological Systems Design”) 2012 - **Organizing Committee**

Editorial Positions

- ACM Journal on Emerging Technologies in Computing Systems Associated Editor 2020-Present
- BioDesign Research Associated Editor 2019-Present
- Oxford University Press Synthetic Biology Editorial Board Member 2016-Present
- ACS Synthetic Biology Editorial Advisory Board Member 2011-Present
- Software Division Director for the International Genetically Engineered Machine Competition 2011-2013
- ACS Synthetic Biology - Editor (Bio-Design Automation Special Issue), vol. 1, no. 8, August 2012
- IEEE Design and Test - Editor (Synthetic Biology Special Issue), vol.29, no.3, June 2012
- SRC SemiSynBio Roadmap Member 2015-Present

Technical Program Committee/Reviewer

Technical Program Committee

- International Joint Conference on Artificial Intelligence (IJCAI) 2016
- 17th Euromicro Conference on Digital System Design (EuroMicro) 2014
- Functional Programming Concepts in Domain-Specific Languages 2013 (FPCDSL)
- 8th International Symposium on Bioinformatics Research and Applications (ISBRA 2012)
- Design Automation Conference (DAC) 2011
- International Genetically Engineered Machine (iGEM) competition judge 2010, 2012, 2013
- International Conference on Computer Aided Design (ICCAD) 2009, 2010, 2011, 2012 (Novel Circuits and Biosystems)
- IEEE International Conference on Emerging Technologies and Factory Automation (ETFa) 2009

Reviewer

- Nature Biotechnology 2020
- Nature Communications 2020
- Microfluidics and Nanofluidics 2020
- Nature Methods 2014
- Bioinformatics 2013, 2015, 2016
- ACS Synthetic Biology 2012, 2013, 2014, 2015, 2016, 2017, 2020
- Journal of Biological Engineering 2012
- PLoS One 2011
- BMC Systems Biology 2011
- International Conference on Hardware/Software Codesign and System Synthesis (CODES) 2005, 2006, 2007
- International Conference on Computer Aided Design (ICCAD) 2005, 2009, 2010, 2011, 2012
- ACM Transactions on Embedded Computing Systems (TECS) 2004 (1), 2009 (2)
- ACM Transactions on Design Automation of Electronic Systems (TODAES) 2009

Technical Presentations (Selected)

Conferences

1. *“Hardware, Software, Wetware Co-design Applied to Synthetic Biology”*
2020 1st International BioDesign Research Conference, December 2020
2. *“Design Automation for Microfluidic Synthetic Biology”*
2019 2nd Annual Synthetic Biology USA Congress, May 2019
3. *“How Bio-Design Automation Can Help Reboot Computing: Lessons, Challenges, and Future Directions”*
2017 IEEE International Conference on Rebooting Computing (ICRC), November 2017
4. *“Hardware/Wetware Co-Design: CAD for Microfluidic Synthetic Biology”*
Synthetic Biology: Engineering, Evolution and Design (SEED), July 2016
5. *“Bio-CAD Hands-On Tutorial”*
Keystone Precision Genome Engineering and Synthetic Biology, January 2015
6. *“Software + Robots + Biology”*
Synthetic Biology 6.0 (SB6.0), July 2013
7. *“CAD For Synthetic Biology”*
Keystone Precision Genome Engineering and Synthetic Biology, March 2013
8. *“Experimentally Driven Verification for Synthetic Biological Circuits”*
Design, Automation, and Test Europe (DATE) 2012, March 2012
9. *“Tools for Synthetic Biology”*
Synthetic Biology 5.0 (SB5.0), June 2011
10. *“Rule Based Constraints for the Construction of Genetic Devices”*
International Symposium on Circuits and Systems (ISCAS) 2009, May 2010
11. *“Eugene: A Domain Specific Language for Specifying Biological Constructs at Higher Levels of Abstraction”*
Advances in Synthetic Biology, March 2010
12. *“Combinational Logic Design in Synthetic Biology”*
International Symposium on Circuits and Systems (ISCAS) 2009, May 2009
13. *“A Platform-Based Design Environment for Synthetic Biological Systems”*
2009 Richard Tapia Celebration of Diversity in Computing Conference, April 2009
14. *“System Level Synthesis: Functions, Architectures, and Communication”* (Tutorial Session)
Asia, South Pacific Design Automation Conference (ASPDAC) 2008, January 2008
15. *“Microarchitecture Development via Metropolis Successive Platform Refinement”*
Design, Automation, and Test Europe (DATE) 2004, February 2004

Invited Talks

16. *“Bio-Design Automation in Synthetic Biology: Research, Commercialization, and Education”*
NSF Distinguished Lecture Series (Virtual), March 2021
17. *“DAMP Lab: Services, Workflows, and Infrastructure for Remote Synthetic Biology”*
Global Biofoundries Alliance (Virtual), January 2021
18. *“Genetic Circuits, Cloud Labs, and COVID-19”*
Northwestern University (Virtual), November 2020
19. *“Genetic Circuits, Cloud Labs, and COVID-19: CPS as Applied to Synthetic Biology”*
University of Southern California (Virtual), September 2020
20. *“Hardware/Wetware Co-Design: CAD for Microfluidic Synthetic Biology”*
SynBio 4 Defense, September 2018
21. *“Hardware, Wetware, Software Co-Design for Synthetic Biology”*
Synthetic Genomics, May 2018
22. *“Circuits in Cells, Bits in Bugs – How (Synthetic) Biology is a Computing Platform”*
University of Pennsylvania, November 2016

23. *“Circuits in Cells, Bits in Bugs – How (Synthetic) Biology is a Computing Platform”*
University of Virginia, October 2016
24. *“BioDesign Automation in Synthetic Biology”*
Cold Spring Harbor Laboratories, August 2016
25. *“The Living Computing Project: Computing Using Living Organisms”*
Columbia University, March 2016
26. *“Biology, Bugs and Bits: Computing and Programming with Synthetic Biology”*
Brown University, November 2015
27. *“%make biology:Bio-Design Automation in Synthetic Biology”*
Intel Corporation, November 2014
28. *“Bio-Design Automation Industrial Opportunities”*
Dow AgroSciences, February 2014
29. *“Programming Life: The Revolutionary Potential of Synthetic Biology”*
Discover Magazine Panel, March 2013
30. *“Clotho”*
SynBioBeta, November 2012
31. *“Specification, Design, and Assembly Automation Workflows in Synthetic Biology”*
Society for Industrial Microbiology Annual Meeting and Exhibition, August 2012
32. *“Bio CAD-CAM: Computational Approaches for Functional, Correct by Design Synthetic Biology”*
ONR/ARO/AFOSR Synthetic/Engineering Biology Workshop, June 2012
33. *“Specification, Design, and Assembly: An Introduction to the Clotho Design Flow”*
Genomatica, Lincoln Labs, Summer 2012
34. *“Circuits, Code, and Cells”*
Life Technologies, Summer 2011
35. *“EDA to BDA”*
Boston University, Wellesley, Fall 2010
36. *“Platform-Based Design: From Cruise Control to Cancer Killer”*
Boston University, BBN Technologies, Georgia Tech, Tufts University, Yale, Notre Dame, Spring 2010
37. *“Clotho and Eugene: Tools and Languages to Create a Platform-Based Design Strategy for Synthetic Biology”*
Joint BioEnergy Institute, October 2009
38. *“What Do Embedded Electronics and Synthetic Biology Have In Common?”*
Siemens Technology-to-Business Center (TTB), July 2009
39. *“The Application of Platform-Based Design to Embedded Electronics and Synthetic Biological Systems”*
Columbia University, University of Washington, University of California (San Diego and LA), Spring 2009
40. *“Computer Aided Design of Synthetic Biological Systems Using Standardized Parts”*
Center for Hybrid and Embedded Software Systems (CHESS) Seminar, November 2008
41. *“Computer-Aided Design”* (Roundtable Leader)
Synthetic Biology 4.0, October 2008
42. *“The Platform-Based Design Methodology: Its application to embedded system design and synthetic biology”*
Columbia University, March 2008
43. *“Programmable Architecture Modeling in Metropolis”*
Cisco Systems, December 2007
44. *“A Design Flow for the Development, Characterization, and Refinement of System Level Architectural Services”*
Center for Hybrid and Embedded Software Systems (CHESS) Seminar, May 2007
45. *“Architecture Modeling and Refinement Verification in Metropolis”*
Center for Hybrid and Embedded Software Systems (CHESS) Seminar, May 2005
46. *“Metropolis: Overview and Architecture Modeling Proposal”*
Xilinx Research Labs, April 2004

Other Activities

Mentoring

- STEM Pathways Founder - 2017-Present - *www.stempathways.org*
- Boston University Research Internship in Science and Engineering (RISE) mentor - 2012, 2016

University Initiatives

- BU Clinical Testing Laboratory (COVID-19 Testing) Core Contributor - Summer 2020
- College of Engineering Diversity, Equity, and Inclusion Committee - 2020
- Hariri Institute for Computing and Computational Science and Engineering Steering Committee Member - 2018-2020

Memberships

Professional: AIMBE, IEEE, IEEE Computer Society, ACM, ACM SIGDA, Eta Kappa Nu (HKN), National Society of Black Engineers (NSBE), Institute of Biological Engineering (IBE), Engineering Biology Research Consortium (EBRC), Synthetic Biology Open Language (SBOL) Developer, Hariri Institute for Computing and Computational Science and Engineering