

HIEU T. BUI

Assistant Professor of Computer Science
The Catholic University of America
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ACADEMIC POSITIONS

Assistant Professor of Computer Science

The Catholic University of America

August 2019 – present

National Research Council Postdoctoral Fellow

U.S. Naval Research Laboratory

August 2017 – August 2019

EDUCATION

Duke University, Durham, North Carolina

Ph.D. in Computer Science

May 2017

– Dissertation: *Localized DNA Computation (Advisor: John Reif)*

Boise State University, Boise, Idaho

M.S. in Electrical and Computer Engineering

May 2011

– Thesis: *Nanoscale Photonic Devices Fabricated Using DNA Nanostructures*

B.S. in Electrical and Computer Engineering

May 2008

University Honors with Distinction, *cum laude*

TEACHING EXPERIENCE

The Catholic University of America, Washington D.C.

Assistant Professor

August 2019 – present

Course Title | Semester

Introduction to Computational Thinking (CSC120) – Fall 2019, Fall 2020 | Theory to Computing (CSC212) – Spring 2020 | Molecular Computing (CSC520) – Spring 2020 | Introduction to Computer Graphics (CSC322) – Fall 2020 | Fundamental of Neural Networks (CSC427) – Fall 2020

Duke Talent Identification Program, Durham, North Carolina

Instructor

June 2017 – July 2017

Course Title | Enrollment – Semester

Introduction to Nanotechnology | 30 students – Summer 2017

Duke University, Durham, North Carolina

Graduate Teaching Assistant

2012 – 2017

Course Title | Enrollment – Semester

Data Structures and Algorithms | 340 students – Fall 2016

Introduction to Computer Science | 300 students – Fall 2014

Introduction to Computer Science | 160 students – Spring 2014

Introduction to Computer Science | 200 students – Fall 2013

GRADUATE AND UNDERGRADUATE RESEARCH ADVISEES

Current Graduate Advisees:

Alana Vidal-Torres (EE graduate student 2019 – current)

Ava Filipour (CS graduate student 2019 – current)

Current Undergraduate Advisees:

Trieu Nguyen (CS undergraduate student 2019 – current)

AWARDS, GRANTS AND HONORS

NRC Publication Award 2020

CUA SOE EECS Start-up Grant: \$30,000

DTRA NRL Grant: \$196,000 (2020 – 2023)

National Research Council Fellowship 2017 – 2019

Duke Computer Science Outstanding PhD Dissertation 2017

DNA19 traveling award for DNA19 Conference 2013

Duke CS traveling award for FNANO Conference 2013

Duke GPNANO Fellowship for Spring 2013

Duke University Graduate School Fellowship 2012 – 2014

Spring Materials Research Society (MRS) Meeting - Outstanding Symposium Paper Award, San Francisco CA, 2008

ECE Outstanding Graduating Senior, Department of Electrical and Computer Engineering, Boise State University, Boise ID, 2008

Micron Scholars-Engineering Scholarship, Micron Inc., Boise ID, 2007 – 2008

Robert R. Lee Scholarship, Boise ID, 2004 – 2006

PROFESSIONAL ORGANIZATIONS & SERVICES

National Society of Collegiate Scholars (NSCS), Eta Kappa Nu Electrical and Computer Engineering Honor Society (HKN), International Society for Nanoscale Science, Computation and Engineering (ISNSCE), F1000Prime.

Assistant Referee/Reviewer for ACS, Nature, Science, FNANO, DNA19, DNA20, DNA21.

PUBLICATIONS

Dissertation (Ph.D.) (*Outstanding Ph.D. Dissertation Award*)

1. **Hieu Bui**, Localized DNA Computation, **Duke University**, May 2017.

Thesis (M.Sc.)

1. **Hieu Bui**, Nanoscale Photonic Devices Fabricated Using DNA Nanostructures, **Boise State University**, 2011.

Refereed Journal Articles, Book Chapters & Conference Articles

1. Alana Vidal Torres, Igor L Medintz, **Hieu Bui**, “DNA Microsystems for Biodiagnosis”, *MDPI Micromachines* (2020).
2. **Hieu Bui**, Sebastián A Díaz, Jake Fontana, Matthew Chiriboga, Remi Veneziano, Igor L Medintz, “Utilizing the Organizational Power of DNA Scaffolds for New Nanophotonic Applications”, *Advanced Optical Materials* (2019).

3. Tianqi Song, Abeer Eshra, Shalin Shah, **Hieu Bui**, Daniel Fu, Ming Yang, Reem Mokhtar, John Reif, “Fast and compact DNA logic circuits based on single-stranded gates using strand-displacing polymerase”, *Nature Nanotechnology* (2019).
4. Tianqi Song, Shalin Shah, **Hieu Bui**, Sudhanshu Garg, Abeer Eshra, Daniel Fu, Ming Yang, Reem Mokhtar, John Reif, “Programming DNA-Based Biomolecular Reaction Networks on Cancer Cell Membranes”, *Journal of the American Chemical Society* (2019).
5. Divita Mathur, William P Klein, Matthew Chiriboga, **Hieu Bui**, Eunkeu Oh, Rafaela Nita, Jawad Naciri, Paul Johns, Jake Fontana, Sebastián A Díaz, Igor L Medintz, “Analyzing fidelity and reproducibility of DNA templated plasmonic nanostructures”, *Nanoscale* (2019).
6. Sudhanshu Garg, **Hieu Bui**, Abeer Eshra, Shalin Shah, John Reif, “Nucleic Acid Hairpins: A Robust and Powerful Motif for Molecular Devices”, *Soft Nanomaterials* (2019).
7. **Hieu Bui**, Carl Brown III, Susan Buckhout-White, Sebastian Diaz, Michael Stewart, Kimihiro Susumu, Eunkeu Oh, Mario Ancona, Ellen Goldman, Igor Medintz, “Transducing Protease Activity into DNA Output for Developing Smart Bionanosensors”, *Small* (2019).
8. Sudhanshu Garg, Shalin Shah, **Hieu Bui**, Tianqi Song, Reem Mokhtar, John Reif, “Renewable Time-Responsive DNA Circuits”, *Small* (2018).
9. **Hieu Bui**, Shalin Shah, Reem Mokhtar, Tianqi Song, Sudhanshu Garg, John Reif, “Localized DNA Hybridization Chain Reactions on DNA Origami”, *ACS Nano* (2018).
10. Sudhanshu Garg, Shalin Shah, **Hieu Bui**, Tianqi Song, Reem Mokhtar, John Reif, “Renewable Time-Responsive DNA Circuits”, *Small* (2018).
11. Tianqi Song, Nikhil Gopalkrishnan, Abeer Eshra, Sudhanshu Garg, Reem Mokhtar, **Hieu Bui**, Harish Chandran, John Reif, “Improving the Performance of DNA Strand Displacement Circuits by Shadow Cancellation”, *ACS Nano* (2018).
12. **Hieu Bui**, Vincent Miao, Sudhanshu Garg, Reem Mokhtar, Tianqi Song, John Reif, “Design and Analysis of Localized DNA Hybridization Chain Reactions”, *Small* (2017).
13. **Hieu Bui**, Sudhanshu Garg, Vincent Miao, Reem Mokhtar, Tianqi Song, John Reif, “Design and Analysis of Linear Cascade DNA Hybridization Chain Reactions Using DNA Hairpins”, *New Journal of Physics* (2017).
14. Tianqi Song, Sudhanshu Garg, Reem Mokhtar, **Hieu Bui**, John Reif, “Design and Analysis of Compact DNA Strand Displacement Circuits for Analog Computation Using Autocatalytic Amplifiers”, *ACS Synthetic Biology* (2017).

15. Reem Mokhtar, Sudhanshu Garg, Harish Chandran, **Hieu Bui**, Tianqi Song, John Reif, “Modeling DNA Nanodevices Using Graph Rewrite Systems”, *Advances in Unconventional Computing*, Edited by Andrew Adamatzky , Springer International Publishing (2017).
16. Tianqi Song, Sudhanshu Garg, Reem Mokhtar, **Hieu Bui**, John Reif, “Analog Computation by DNA Strand Displacement Circuits”, *ACS Synthetic Biology* (2016).
17. Sudhanshu Garg, Reem Mokhtar, Tianqi Song, **Hieu Bui**, Nikhil Gopalkrishnan, and John H Reif, DNA Computing, Chapter in *Computing Handbook, Volume I: Computer Science and Software Engineering, Section 3: Architecture and Organization*, Edited by Teofilo F. Gonzalez, Taylor & Francis Group, (2013).
18. Elton Graugnard, Donald L. Kellis, **Hieu Bui**, Stephanie Barnes, Wan Kuang, Jeunghoon Lee , William L. Hughes, William B. Knowlton, and Bernard Yurke , “DNA-Controlled Excitonic Switches” , *Nano Letters* 12(4), (2012) p. 2117-2122.
19. **Hieu Bui**, Craig Onodera, Carson Kidwell, YerPeng Tan, Elton Graugnard, Wan Kuang, Jeunghoon Lee, William B. Knowlton, Bernard Yurke, and William L. Hughes, “Programmable Periodicity of Quantum Dot Arrays with DNA Origami Nanotubes”, *Nano Letters*. 2010, 10 (9): 3367-3372.
20. **Hieu Bui**, Craig Onodera, Bernard Yurke, Elton Graugnard, Wan Kuang, Jeunghoon Lee, William B. Knowlton, and William L. Hughes, “Atomic Force Microscopy of DNA Self-Assembled Nanostructures for Device Applications”, Oral and paper presentation, *2009 International Semiconductor Research Conference*, University of Maryland, MD, Dec 9-11, 2009: 1-2.
21. Stephanie Barnes, Christopher Buu, Jason Brotherton, **Hieu Bui**, Austin Johnson, Mallory Yates, Wan Kuang, Jeunghoon Lee, William L. Hughes, William Knowlton, Bernard Yurke, “Radial Dielectrophoretic Trap For Future Manipulation Of Individual DNA Origami Nanostructures”, Oral and paper presentation, *Nanoelectronic Devices for Defense & Security Conference*, Ft. Lauderdale, FL, Sep 28-Oct 3, 2009.
22. R. Southwick III, J. Reed, C. Buu, **H. Bui**, R. Butler, G. Bersuker, and W.B. Knowlton, “Temperature (5.6-300K) Dependence Comparison of Carrier Transport Mechanisms in HfO₂/SiO₂ and SiO₂ MOS Gate Stacks”, Paper presentation, *2008 IEEE International Integrated Reliability Workshop*, Fallen Leaf Lake, CA, Oct 12-16, 2008: 48-54.

INVITED TALKS

- Hieu Bui, *Department of Electrical Engineering and Computer Science*, The Catholic University of America, Washington DC, April 2019.
- Hieu Bui, *Center for Biomolecular Science & Engineering Seminar*, U.S. Naval Research Laboratory, Washington DC, June 2017.
- Hieu Bui *et al.*, *Materials Science and Engineering Seminar*, Boise State University, Boise ID, March 2011.

- Hieu Bui *et al.*, *16th International Conference on DNA Computing and Molecular Programming*, Hong Kong China, June 2010.
- Hieu Bui *et al.*, *Materials Science and Engineering Seminar*, Boise State University, Boise ID, March 2009.

SCIENTIFIC MEETINGS

- CUA SOE EECS Seminar Series, Spring 2020 (**Seminar Organizer**)
- 2nd Mid-Atlantic DNA Nanotechnology Symposium, National Institute of Standard and Technology, 2019 (**Conference Organizer**)
- 25th International Conference on DNA Computing and Molecular Programming, University of Washington, WA, 2019
- 16th Annual Conference – Foundations of Nanoscience – Self-assembled Architectures and Devices, Snowbird UT, 2019
- 1st Mid-Atlantic DNA Nanotechnology Symposium, National Institute of Standard and Technology, 2017 (**Conference Organizer**)
- 13th Annual Conference – Foundations of Nanoscience – Self-assembled Architectures and Devices, Snowbird UT, 2016 (**Conference Organizer**)
- 12th Annual Conference – Foundations of Nanoscience – Self-assembled Architectures and Devices, Snowbird UT, 2015 (**Conference Organizer**)
- 11th Annual Conference – Foundations of Nanoscience – Self-assembled Architectures and Devices, Snowbird UT, 2014 (**Conference Organizer**)
- 19th International Conference on DNA Computing and Molecular Programming, ASU-Tempe, AZ, 2013
- 10th Annual Conference – Foundations of Nanoscience – Self-assembled Architectures and Devices, Snowbird UT, 2013 (**Conference Organizer**)
- 17th International Conference on DNA Computing and Molecular Programming, Caltech-Pasadena, CA, 2011
- 8th Annual Conference – Foundations of Nanoscience – Self-assembled Architectures and Devices, Snowbird UT, 2011
- 16th International Conference on DNA Computing and Molecular Programming, Hong Kong China, 2010
- 7th Annual Conference – Foundations of Nanoscience – Self-assembled Architectures and Devices, Snowbird UT, 2010