

CONTACT  
INFORMATION

Department of Computer Science [xhuan5@uis.edu](mailto:xhuan5@uis.edu)  
3115 UHB, One University Plaza Phone: +1 (217) 206-8336  
Springfield, IL 62703-5407, USA

CURRENT  
POSITION

Assistant Professor, University of Illinois Springfield, Springfield, IL, USA (August 2020 to present).

PERSONAL  
WEBSITE

[xianghuang.org](http://xianghuang.org)

RESEARCH  
INTERESTS

Algorithmic Information Theory, Analog Computing, DNA/Molecular Programming, Normal numbers, and Theoretical Computer Science in general.

VISITING  
POSITIONS

Visiting Associate, California Institute of Technology (August 2024 – December 2024, hosted by [Erik Winfree](#)).

Visiting Assistant Professor, Le Moyne College, Syracuse, NY (September 2019 – June 2020).

## EDUCATION

**Iowa State University**, IA, USA

Ph.D. in Computer Science, 2020.

- Thesis: *Chemical Reaction Networks: Computability, Complexity, and Randomness*.
- Advisor: Jack H. Lutz.

**Institute of Software, Chinese Academy of Sciences**, Beijing, China

Computer Science, September 2009 – June 2012.

- Topic: *Model Checking, Formal Methods, Automata Theory*.

**Nanjing University**, Nanjing, China

B.E. in Software Engineering, September 2005 – June 2009.

## GRANT SUPPORT

External Support:

1. Principal investigator: *Towards A Hierarchy of Real Numbers Computable by CRN*, \$400,000, Department of Energy EXPRESS grant, 2023–2025.

UIS and University of Illinois System Internal Support:

4. National Taiwan University-University of Illinois System Travel Grants Program, \$5,000, 2024.
3. Competitive Scholarly Research Grant, \$5,000, 2023–2024.
2. Grant Writing Mentorship Award, \$1,500, 2022–2023.
1. Leadership Lived Experience (LLE) student employment initiative, \$4,000, 2022.

JOURNAL  
PUBLICATIONS

2. Xiang Huang, Jack H. Lutz, Elvira Mayordomo, and Donald M. Stull, “Asymptotic divergences and strong dichotomy,” *IEEE Transactions on Information Theory* 67 (2021), pp. 6296–6305.
1. Xiang Huang, Titus H. Klinge, James I. Lathrop, Xiaoyuan Li and Jack H. Lutz, “Real-Time Computability of Real Numbers by Chemical Reaction Networks,” *Natural Computing* 18(1) (2019), pp. 63–73 (**invited paper**).

CONFERENCE  
PUBLICATIONS

(Supervised students are underlined.)

7. Nicholas Haisler, Xiang Huang, Andrei N Migunov, and Khalid Mohammed, Garrett Provence. “A Selective Dual-Railing Technique for General Purpose Analog Computers ” *In Proceedings of the 22nd International Conference on Unconventional Computation and Natural Computation (UCNC 2025), Sep 2025*
6. Xiang Huang and Rachel Huls, “Computing Real Numbers with Large-Population Protocols Having a Continuum of Equilibria,” *The 28th International Conference on DNA Computing and Molecular Programming* (DNA 28, Albuquerque, NM, August 8–12, 2022).
5. Xiang Huang, Jack H. Lutz, Elvira Mayordomo, and Donald M. Stull, “Asymptotic divergences and strong dichotomy,” *Proceedings of the Thirty-seventh Symposium on Theoretical Aspects of Computer Science* (STACS 2020, Montpellier, France, March 10–13, 2020).
4. Xiang Huang, Jack H. Lutz, and Andrei N. Migunov, “Algorithmic Randomness in Continuous-Time Markov Chains,” *Proceedings of the 57th Annual Allerton Conference on Communication, Control, and Computing* (2019).
3. Xiang Huang, Titus H. Klinge, and James I. Lathrop, “Real-Time Equivalence of Chemical Reaction Networks and Analog Computers,” *DNA Computing and Molecular Programming* (DNA 2019), Lecture Notes in Computer Science, vol. 11648, Springer, Cham.
2. Xiang Huang, Titus H. Klinge, James I. Lathrop, Xiaoyuan Li, and Jack H. Lutz, “Real-Time Computability of Real Numbers by Chemical Reaction Networks,” *Proceedings of the 16th International Conference on Unconventional Computation and Natural Computation* (UCNC 2017), pp. 29–40.
1. Xiang Huang and Donald M. Stull, “Polynomial Space Randomness in Analysis,” *Proceedings of the 41st International Symposium on Mathematical Foundations of Computer Science* (MFCS 2016), 86:1–86:13.

PEER-REVIEWED  
WORKSHOP  
PAPER/EXTENDED  
ABSTRACT

1. Xiang Huang and Andrei N. Migunov, “A General Purpose Analog Computer to Population Protocol Compiler,” *In Proceedings of the 21st ACM International Conference on Computing Frontiers Workshops and Special Sessions (CF ’24 Companion)*, May 2024.

BOOK CHAPTER

1. Xiang Huang, “Deterministic Chemical Reaction Network,” completed chapter for *The Art of Molecular Programming*. Part of a DNA/molecular programming community initiative to create a comprehensive molecular programming textbook ([molecularprogrammers.org](http://molecularprogrammers.org)).

## AWARDS

2. The International Society for Nanoscale Science, Computation and Engineering (ISNSCE) [Best Student Presentation Award](#), at 25th International Conference on DNA Computing and Molecular Programming (DNA25), August 2019.
1. Teaching Excellence Award, Iowa State University, 2017.

## INVITED TALKS

*Computing Real Numbers with Large-Population Protocols*, Drake University, October 2023.  
*Some Thoughts on Normality, Algorithmic Randomness, and Analog Computing*, The Fifth Nanjing University Youth Forum, May 2020 (Remote).  
*Asymptotic Divergences and Strong Dichotomy*, Iowa Colloquium on Information, Complexity, and Logic (ICICL), Spring 2019.

## CONTRIBUTED TALKS

*Computing Real Numbers with Large-Population Protocols Having a Continuum of Equilibria*, DNA 28, August 2022.  
*Real-Time Equivalence of Chemical Reaction Networks and Analog Computers*, DNA 25, August 2019.  
*Real-Time Computability of Real Numbers by Chemical Reaction Networks*, The 19th Graduate Student Conference in Logic, Madison, WI, April 2018.  
*Real-Time Computability of Real Numbers by Chemical Reaction Networks*, UCNC 2017.

## TEACHING EXPERIENCE

### At UIS

CSC 570F – Graduate Algorithms and Applications	Spring 2023
CSC 302 – Discrete Structures	Fall 2020 to present
CSC 482 – Algorithms and Theory of Computation	Fall 2020 to present

### As Instructor at Le Moyne College

CSC 175 – Introduction to Algorithms and Program Design	Fall 2019
CSC 170 – Java Introduction (no prior programming experience)	Spring 2020
CSC 176 – Java Introduction (as a second programming course)	Spring 2020
CSC 276 – Object Oriented Design Using Java	Spring 2020

### As Teaching Assistant at Iowa State

COM S 531 – Theory of Computation (Graduate)	Spring 2014, 2016
COM S 511 – Algorithm Design and Analysis (Graduate)	Fall 2014, 2015, 2017
COM S 331 – Theory of Computation	Fall 2016, Spring 2019
COM S 311 – Algorithm Design	Summer 2015, 2016, Fall 2018
COM S 330 – Discrete Mathematical Structures	Spring 2014
COM S 252 – Introduction to Operating Systems	Fall 2013

UNDERGRADUATE STUDENT RESEARCH SUPERVISION Selected undergraduate student research projects (Complete list at [xianghuang.org](http://xianghuang.org)):

- Rachel Huls (2021–2022): Research on large-population protocols computability, resulting in [publication](#) at DNA 28.
- Anish Sinha (2022–2023): Concurrent B-Link-Trees. Winner of Best Research Product Award, UIS STARS 2023.
- Jonathan Miller (2023): Survey on Large Integer Multiplication Algorithms. [Survey paper](#) completed.

Total: 11 undergraduate students mentored (2021–present) in theoretical computer science research.