DANH-TAI HOANG, PhD

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EDUCATION

2013: Ph.D., Theoretical Physics, French National Center for Scientific Research (CNRS) and University of Cergy-Pontoise, France

2007: M.S., Physics, Vinh University, Vietnam

2004: B.S., Physics, Vinh University, Vietnam

RESEARCH EXPERIENCE

2016-Present: **Postdoctoral Research Fellow** in Biophysics
Laboratory of Biological Modeling,
National Institute of Diabetes and Digestive and Kidney Diseases,
National Institutes of Health, Bethesda, Maryland, USA.
Research subject: *Network inference in stochastic processes*
Supervisor: Dr. Vipul Periwal

2013-2016: **Postdoctoral Research Fellow** in Biophysics
Asia Pacific Center for Theoretical Physics, Pohang, South Korea.
Research subject: *Design principles of cellular networks*
Supervisor: Prof. Junghyo Jo

2009-2013: **PhD Student** in Theoretical Physics
Laboratory for Theoretical Physics and Modeling,
French National Center for Scientific Research (CNRS) – UMR 8089,
University of Cergy-Pontoise, France.
Research subject: *Phase transition and spin transport in complex systems*
Supervisor: Prof. H. T. Diep

HONORS & AWARDS

2008 Recognition for Excellence in Scientific Research, Quang Binh University
2007 Award for Excellence in Study, Vinh University
2005 "Outstanding efforts in Scientific Research" Award, Graduate School, Vinh University
2004 National Award for Student Scientific Research, Vietnam Ministry of Education & Training
2004 "Outstanding efforts in Scientific Research" Award, Vinh University
2003 First Prize at Student Teaching Competition, Physics Department, Vinh University
2003 "Excellent Student" Award, Vinh University
2002 Second Prize at the Physics Olympiad, Physics Department, Vinh University

GRANTS

2013-2016 National Research Foundation of Korea
2010-2012 France-Poland International Program: Hubert Curien Partnership
(University of Cergy-Pontoise and Adam Mickiewicz University)

SOFTWARE DEVELOPMENT

1. Python package for network inference in stochastics systems:
https://danhtaihoang.github.io/network-inference

2. Python package for model inference with hidden variables:
https://danhtaihoang.github.io/hidden-variable

3. Python package for inferring network of residue interactions from protein sequence alignments: https://github.com/danhtaihoang/protein-structure-inference

Other programming codes are available at: https://github.com/danhtaihoang

SELECTED PUBLICATIONS (ISI JOURNALS)

20. Danh-Tai Hoang, Joseph McKenna, Chris Yang, and Vipul Periwal, *Data-driven approach for inferring residue interactions in protein sequences*, in preparation.

19. Danh-Tai Hoang, Junghyo Jo, and Vipul Periwal, *Data-driven inference of hidden nodes in networks*, Physical Review E (2019, accepted), arXiv:1901.04122.

18. Danh-Tai Hoang, Juyong Song, Vipul Periwal, and Junghyo Jo, *Network inference in stochastic systems from neurons to currencies: Improved performance at small sample size*, Physical Review E, 99, 023311 (2019).

17. Dong-Ho Park, Taegeun Song, Danh-Tai Hoang, Jin Xu, and Junghyo Jo, *A Local Counter-regulatory motif modulates the global phase of hormonal oscillations*, Nature-Scientific Reports, 7, 1602 (2017).

16. Danh-Tai Hoang, Manami Hara, Junghyo Jo, *Design principles of pancreatic islets: Glucose-dependent coordination of hormone pulses,* PLOS ONE, 11(4): e0152446 (2016).

15. Danh-Tai Hoang, B. Prasanna Venkatesh, Seungju Han, Junghyo Jo, Gentaro Watanabe, Mahn-Soo Choi, *Scaling law for irreversible entropy production in critical systems,* Nature-Scientific Reports, 6, 27603 (2016).

14. Marissa Pastor, Juyong Song, Danh-Tai Hoang, Junghyo Jo, *Minimal Perceptrons for Memorizing Binary Patterns*, Physica A, 462, 31-37 (2016).

13. Danh-Tai Hoang, Junghyo Jo, Hyunsuk Hong, *Traveling wave in a three-dimensional array of conformist and contrarian oscillators*, Physical Review E, 91, 032135 (2015).

12. Danh-Tai Hoang, Hitomi Matsunari, Masaki Nagaya, Hiroshi Nagashima, J. Michael Millis, Piotr Witkowski, Vipul Periwal, Manami Hara, Junghyo Jo, *A Conserved Rule for Pancreatic Islet Organization*, PLOS ONE, 9, 10, e110384 (2014).

11. Juyong Song, Danh-Tai Hoang, Jongwook Kim, and Junghyo Jo, *Population balancing with species switching*, J. Korean Phys. Soc., 61, 1, 111-116 (2014).

10. Danh-Tai Hoang and H. T. Diep, *Phase transition in dimer liquids*, J. Phys.: Condens. Matter., 26, 035103 (2014).

9. H. T. Diep, Virgile Bocchetti, Danh-Tai Hoang, and V. T. Ngo, *Theory and simulation of magnetic material: Physics at phase frontiers*, J. Phys.: Conference Series, 537, 01200 (2014).

8. Danh-Tai Hoang, Juyong Song, and Junghyo Jo, *Partial mixing phase of binary cells in finite systems*, Physical Review E. 88, 062725 (2013).

7. Maciej Kasperski, Henryk Puszkarsi, Danh-Tai Hoang, and H. T. Diep, *Magnetic properties of two-dimensional nanodots: Ground state and phase transition*, AIP Advances, 3, 122121 (2013).

6. Danh-Tai Hoang, Maciej Kasperski, Henryk Puszkarsi, and H. T. Diep, *Re-orientation transition in molecular thin films: Potts model with dipolar interaction*, J. Phys.: Condens. Matter., 25, 056006 (2013).

5. Danh-Tai Hoang and H. T. Diep, *Effect of dipolar interaction in molecular crystals*, J. Phys.: Condens. Matter., 24, 415402 (2012).

4. Danh-Tai Hoang and H. T. Diep, *Hexagonal-close-packed lattice: Ground state and phase transition*, Physical Review E, 85, 041107 (2012).

3. H. T. Diep, Yann Magnin and Danh-Tai Hoang, *Spin resistivity in magnetic materials*, Acta. Phys. Pol. A, 121, 985-991 (2012).

2. Danh-Tai Hoang, Yann Magnin and H. T. Diep, *Spin resistivity in the frustrated J_1-J_2 model*, Mod. Phys. Lett. B, 25, 937-945 (2011).

1. Yann Magnin, Danh-Tai Hoang and H. T. Diep, *Spin transport in magnetically ordered systems: Effect of the lattice relaxation time*, Mod. Phys. Lett. B, 25, 1029-1040 (2011).

CONFERENCE PRESENTATIONS

Invited

6. Danh-Tai Hoang, Junghyo Jo, and Vipul Periwal, *System inference with small sample size in stochastic systems* (keynote, presented by Vipul Periwal), NIST Workshop on Complex Systems Chemistry at the Nexus of Chaos, Emergence, and Information Theory, October 22-24, 2018, NIST, Maryland, USA.

5. Danh-Tai Hoang, Juyong Song, Vipul Periwal, and Junghyo Jo, *Causality inference in stochastic systems from neurons to currencies*: profiting from small sample size (invited, presented by Vipul Periwal), 2018 Quantitative Life Science Workshop, October 15-18, 2018, KIAS, Seoul, Korea.

4. Danh-Tai Hoang, Juyong Song, Vipul Periwal, and Junghyo Jo, *Non-equilibrium Network Reconstruction with Little Data* (invited, presented by Danh-Tai Hoang), Workshop on Push the Envelope of Statistical Physics: Econo, Social, Bio and Beyond, December 12-15, 2016, Pohang, Korea.

3. Danh-Tai Hoang, Manami Hara, and Junghyo Jo, *Cellular Organization and Controllable Synchronization of Pancreatic Islets* (invited, presented by Danh-Tai Hoang), Korean Physical Society (KPS) Fall Meeting, October 21-23, 2015, Gyeongju, Korea.

2. Danh-Tai Hoang and Junghyo Jo, *Morphogenesis in Life: Pancreatic Islets* (invited, presented by Danh-Tai Hoang), APCTP Workshop on Theoretical Physics, December 16, 2013, Pohang, Korea.

1. Yann Magnin, Danh-Tai Hoang, and H. T. Diep, *Spin Resistivity in Magnetic Materials* (invited, presented by H. T. Diep), European Conference "Physics of Magnetism 2011" (PM'11), June 27-July 1, 2011, Poznan, Poland.

Contributed

11. Danh-Tai Hoang, Junghyo Jo, and Vipul Periwal, *Data-driven inference of hidden nodes in networks*, March 19-23, 2019, Cold Spring Harbor Laboratory Meeting in Network Biology, New York city, USA.

10. Danh-Tai Hoang, Junghyo Jo, and Vipul Periwal, *Causality inference in stochastic systems: small sample sizes and hidden variables*, 12th Annual q-bio Conference, June 26-29, 2018, Rice University in Houston, TX, USA.

9. Danh-Tai Hoang, Junghyo Jo, and Vipul Periwal, *Causality inference in stochastic systems: small sample sizes and hidden variables*, NIH BioInformatics Poster day, May 22, 2018, NIH, Bethesda, Maryland, USA.

8. Danh-Tai Hoang, Juyong Song, Vipul Periwal, and Junghyo Jo, *Maximizing weighted Shannon entropy for network inference with little data*, 11th Annual q-bio Conference, July 25-28, 2017, Rutgers University, New Jersey, USA.

7. Danh-Tai Hoang, Manami Hara, and Junghyo Jo, *Cellular Organization and Controllable Synchronization of Pancreatic Islets*, APCTP 2015 Workshop on Frontiers of Physics, December 20-23, 2015, Yeosu, Korea.

6. Danh-Tai Hoang, Manami Hara, and Junghyo Jo, *Cellular Organization and Synchronization of Pancreatic Islets*, 3rd International Workshop on Theoretical and Computational Physics (IWTCP-3): Complex Systems and Interdisciplinary Physics, July 27-30, 2015, Dalat, Vietnam.

5. Danh-Tai Hoang and Junghyo Jo, *Conserved Rule for Pancreatic Islet Organization*, XXVI IUPAP Conference on Computational Physics (CCP2014), August 11-14, 2014, Boston, Massachusetts, USA.

4. Danh-Tai Hoang, Junghyo Jo, Hyunsuk Hong, *Synchronization of conformist and contrarian oscillators under pinning force*, Korean Physical Society (KPS) Spring Meeting, April 23-25, 2014, Daejeon, Korea.

3. Danh-Tai Hoang and Junghyo Jo, *Morphogenesis in Life: Pancreatic Islets*, Nurturing Connectivity: Physics and Biology, January 15-16, 2014, Pohang, Korea.

2. Danh-Tai Hoang and Junghyo Jo, *Self-organization of Pancreatic Islets*, XXV IUPAP Conference on Statistical Physics (STATPHYS25), July 22-25, 2013, Seoul, Korea.

1. Danh-Tai Hoang, Yann Magnin, and H. T. Diep, *Spin resistivity in a spin system with a strong first-order transition, International Conference on Frustrated Spin Systems*, Cold Atoms and Nanomaterials, July 14-16, 2010, Hanoi, Vietnam.