

Uttam Bhat

Department of Physics, Boston University
590 Commonwealth Avenue, Boston, MA - 02215
Email: uttam@bu.edu

EDUCATION

2012–2017, Boston University
Ph.D, Department of Physics

2008–2012, Indian Institute of Technology, Bombay
B.Tech, Department of Physics

RESEARCH INTERESTS

- Random walks, Brownian motion, first passage processes and stochastic processes.
- Random graph models, clustering and densification properties of graphs.
- Interdisciplinary applications of statistical physics in biology, ecology and social sciences.

RESEARCH ARTICLES

Random Walk and Brownian Processes

1. **Uttam Bhat**, S. Redner, and O. Bénichou, “*Starvation Dynamics of a Greedy Forager*”, [arXiv: 1704.05861](#)
2. **Uttam Bhat**, S. Redner, and O. Bénichou, “*Does Greed Help a Forager Survive?*”, *Physical Review E*, vol. 95, p. 062119, Jun 2017. [arXiv: 1703.03434](#)
3. **Uttam Bhat**, C. De Bacco, and S. Redner, “*Stochastic Search with Poisson and Deterministic Resetting*”, *Journal of Statistical Mechanics: Theory and Experiment*, vol. 2016, no. 8, p. 083401, 2016. [arXiv: 1605.08812](#)
4. **Uttam Bhat** and S. Redner, “*Intermediate-Level Crossings of a First-Passage Path*”, *Journal of Statistical Mechanics: Theory and Experiment*, vol. 2015, no. 6, p. P06035, 2015. [arXiv: 1505.01184](#)

Complex networks

5. **Uttam Bhat**, M. Shrestha, and L. Hébert-Dufresne, “*Exotic Phase Transitions of k -cores in Clustered Networks*”, *Physical Review E*, vol. 95, p. 012314, Jan 2017. [arXiv: 1607.08637](#)
6. **Uttam Bhat**, P. Krapivsky, R. Lambiotte, and S. Redner, “*Densification and Structural Transitions in Networks that Grow by Node Copying*”, *Physical Review E*, vol. 94, p. 062302, Dec 2016. [arXiv:1610.01662](#)
7. R. Lambiotte, P. Krapivsky, **Uttam Bhat**, and S. Redner, “*Structural Transitions in Dense Networks*”, *Physical Review Letters*, vol. 117, p. 218301, Nov 2016. [arXiv: 1607.03850](#)
8. **Uttam Bhat**, P. L. Krapivsky, and S. Redner, “*Emergence of Clustering in an Acquaintance Model without Homophily*”, *Journal of Statistical Mechanics: Theory and Experiment*, vol. 2014, no. 11, p. P11035, 2014. [arXiv: 1408.6596](#)

Ecology

9. N. J. Dominy, J. D. Yeakel, **Uttam Bhat**, L. Ramsden, R. W. Wrangham, and P. W. Lucas, “*How Chimpanzees Integrate Sensory Information to select Figs*”, *Interface Focus*, vol. 6, no. 3, 2016.
10. J. D. Yeakel, **Uttam Bhat**, E. A. Elliott Smith, and S. D. Newsome, “*Exploring the Isotopic Niche: Isotopic Variance, Physiological Incorporation, and the Temporal Dynamics of Foraging*”, *Frontiers in Ecology and Evolution*, vol. 4, p. 1, 2016. [arXiv: 1510.00767](#)

Lattice Gas

11. **Uttam Bhat** and P. L. Krapivsky, “*Exclusion Processes with Avalanches*”, *Physical Review E*, vol. 90, p. 012133, Jul 2014. [arXiv: 1406.1937](#)

Papers in Preparation

12. L. Hébert-Dufresne, A. F. A. Pellegrini, **Uttam Bhat**, S. Redner, and A. Berdahl, “*Edge fires drive the shape and stability of tropical forests*”
13. **Uttam Bhat** and S. Poledna, “*Pricing Barrier Options*”

CONFERENCE TALKS

- “Stochastic Search with Reset”, Statistical Mechanics Conference, Rutgers University. May 08, 2016
- “Transitive Linking in Networks”, Kinetic Networks: From Topology to Design, Santa Fe Institute. September 18, 2015
- “Emergence of Clustering in Friendship Networks”, Statistical Mechanics Conference, Rutgers University. December 15, 2013
- “Emergence of Clustering in Friendship Networks”, Greater Boston Area Statistical Mechanics Conference. October 12, 2013

OTHER TALKS

- “Surprises in Brownian Motion” *Departmental Seminar*, Department of Physics, Boston University. May 10, 2016
- “Little Knowledge is a Dangerous Thing” (on greedy forager dynamics), *Slice of Science Seminar*, Santa Fe Institute. February 9, 2016
- “Taming the Search-Space in Music” (on degrees of freedom in melodic music and their relation to aesthetics and human psychology), *Reckless Ideas Seminar*, Santa Fe Institute. November 6, 2015
- “Transitive Linking in Acquaintance Dynamics”, *Slice of Science Seminar*, Santa Fe Institute. February 10, 2015

PROGRAMMING AND MATH LANGUAGES

- In order of fluency: C++, C, Mathematica, Python

TEACHING EXPERIENCE

- Teaching Assistant for the Physics Lab for premedical students, Boston University. Fall 2012
- Head Teaching Assistant for the First Course in Probability and Statistics for Engineers, Indian Institute of Technology, Bombay. Spring 2012
- Teaching Assistant for the First Course in Probability and Statistics for Engineers, Indian Institute of Technology, Bombay. Spring 2011
- As a Student Facilitator for the Training and Selection Camp for Astronomy Olympiad in India, I helped prepare tutorial sessions, problems and solutions for camp tests and guide the students on academic and non-academic issues throughout the camp. May 2009, May 2010 and May 2012

INDUSTRY EXPERIENCE

Internship with **Finisar**, Malaysia. Aided in the implementation of a new quality assurance test called “Hitachi RDT Bit Error Rate Test”, and analysed data for the efficiency and effectiveness of the test in Summer, 2011

AWARDS AND PARTICIPATION IN INTERNATIONAL OLYMPIADS

- Bronze medal for the Indian team in the 2nd International Olympiad on Astronomy and Astrophysics (IOAA), Indonesia, 2008
- Silver medal for the Indian team in the 12th International Astronomy Olympiad (IAO), Ukraine, 2007

EXTRA-CURRICULARS

As an amateur musician, I am well-versed in playing flute and have basic skills on piano, guitar and bass (published work at <https://soundcloud.com/uttambhat13>). I won the ‘Cultural Citation’ award (2012) and the ‘Cultural Person of the Year’ award (2011) for my contributions to music as a performer and organizer at Indian Institute of Technology, Bombay. I also enjoy hiking, outdoor activities, photography and painting.