

Satyaki Sikdar

Luddy Center for Artificial Intelligence – Bloomington IN 47408 – USA

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Research Interests

Network science · science of science · social and information networks · machine learning

Education

University of Notre Dame

Ph.D. in Computer Science & Engineering

Notre Dame, IN

2017 – 2022

Adviser: Tim Weninger

Thesis: Scalable and Interpretable Graph Modeling with Graph Grammars

Committee: David Chiang, Peter Kogge, and Danai Koutra

Heritage Institute of Technology

B.Tech. in Computer Science & Engineering

Kolkata, India

2013 – 2017

Advisers: Partha Basuchowdhuri and Subhashis Majumder

Thesis: Learning Models for Influence Maximization

Honors and Awards

Teaching Award: Outstanding Graduate Student Instructor Award 2022

Student Award: Best Student Award for Academic Excellence – Class of 2017

Travel Award: ACM WSDM 2022

Travel Award: ACM IKDD Conference on Data Science 2016

Research Experience

Indiana University

Postdoctoral Fellow, Luddy School of Informatics, Computing, & Engineering

Bloomington, IN

Jan 2022 –

Adviser: Santo Fortunato

Investigated collaboration and citation networks to model the scientific enterprise.

Snap Inc.

Research Intern, Computational Social Science Team

Remote

May – Aug 2020

Mentors: Neil Shah and Leonardo Neves

Modeled large attributed social network graphs.

University of Notre Dame

Graduate Research Assistant

Notre Dame, IN

May 2018 – Dec 2021

Adviser: Tim Weninger

Proposed scalable and interpretable graph generative models using graph grammars.

Heritage Institute of Technology

Undergraduate Research Assistant

Kolkata, India

Apr 2015 – Jul 2017

Advisers: Partha Basuchowdhuri and Subhashis Majumder

Implemented novel graph community detection algorithms.

Publications

(* equal contribution AR acceptance rate IF impact factor)

Journal Articles.....

- [J4] **S. Sikdar***, S. Venturini*, F. Rinaldi, F. Tudisco, and S. Fortunato, "Collaboration and topic switches in science," *Scientific Reports*, 2024, [IF:4.6].
- [J3] Ş. Erkol, **S. Sikdar**, F. Radicchi, and S. Fortunato, "Consistency Pays off in Science," *Quantitative Science Studies (QSS)*, 2023.
- [J2] **S. Sikdar**, D. G. Cedre, T. W. Ford, and T. Weninger, "The Infinity Mirror Test for Graph Models," *IEEE Transactions on Knowledge and Data Engineering (TKDE)*, 2022, [IF:8.9].
- [J1] P. Basuchowdhuri, **S. Sikdar**, V. Nagarajan, K. Mishra, S. Gupta, and S. Majumder, "Fast Detection of Community Structures using Graph Traversal in Social Networks," *Knowledge and Information Systems (KAIS)*, 2018, [IF:2.7].

Conference Papers.....

- [C6] **S. Sikdar**, N. Shah, and T. Weninger, "Attributed Graph Modeling with Vertex Replacement Grammars," *ACM International Conference on Web Search and Data Mining (WSDM)*, 2022, [AR:18%].
- [C5] J. I. Hibshman, D. G. Cedre, **S. Sikdar**, and T. Weninger, "Joint Subgraph-to-Subgraph Transitions: Generalizing Triadic Closure for Powerful and Interpretable Graph Modeling," *ACM International Conference on Web Search and Data Mining (WSDM)*, 2021, [AR:18%].
- [C4] J. I. Hibshman, **S. Sikdar**, and T. Weninger, "Towards Interpretable Graph Modeling with Vertex Replacement Grammars," *IEEE International Conference on Big Data (BigData)*, 2019, [AR:19%].
- [C3] **S. Sikdar**, J. Hibshman, and T. Weninger, "Modeling Graphs with Vertex Replacement Grammars," *IEEE International Conference on Data Mining (ICDM)*, 2019, [AR:9%].
- [C2] C. Pennycuff, **S. Sikdar**, C. Vajiac, D. Chiang, and T. Weninger, "Synchronous Hyperedge Replacement Graph Grammars," *International Conference on Graph Transformation (ICGT)*, 2018.
- [C1] P. Basuchowdhuri, **S. Sikdar**, S. Shreshtha, and S. Majumder, "Detecting Community Structures in Social Networks by Graph Sparsification," *ACM IKDD Conference on Data Science (CODS)*, 2016, [AR:5%].

Peer-reviewed Abstracts.....

- [A5] **S. Sikdar***, S. Venturini*, M. L. Charpignon, S. Kumar, F. Rinaldi, F. Tudisco, S. Fortunato, and M. S. Majumder, "The COVID-19 Research Outbreak: How the Pandemic Culminated in a Surge of New Researchers," *International Conference on Computational Social Science (IC²S²)*, Contributed Talk, 2023, [AR:31%].
- [A4] **S. Sikdar***, S. Venturini*, M. L. Charpignon, S. Kumar, F. Rinaldi, F. Tudisco, S. Fortunato, and M. S. Majumder, "The COVID-19 Research Outbreak: How the Pandemic Culminated in a Surge of New Researchers," *International Conference on Science of Science and Innovation (ICSSI)*, Contributed Talk, 2023.
- [A3] **S. Sikdar***, S. Venturini*, F. Rinaldi, F. Tudisco, and S. Fortunato, "Collaboration and Topic Switches in Science," *International Conference on Computational Social Science (IC²S²)*, Plenary Talk, 2023, [AR:1.75%].
- [A2] **S. Sikdar***, S. Venturini*, F. Rinaldi, F. Tudisco, and S. Fortunato, "Collaboration and Topic Switches in Science," *International Conference on Science of Science and Innovation (ICSSI)*, Contributed Talk, 2023.
- [A1] **S. Sikdar***, S. Venturini*, F. Rinaldi, F. Tudisco, and S. Fortunato, "Collaboration and Topic Switches in Science," *International Conference on Network Science (NetSci)*, Contributed Talk, 2023.

Contributed Chapters.....

- [R2] **S. Sikdar**, "NetworkX Graph Library," *A Survey of Graph Processing Paradigms*, P. M. Kogge, Ed., University of Notre Dame, 2019. DOI: 10.7274/10-z6dc-9c71.

- [R1] **S. Sikdar**, "*Spectral Community Detection*," *A Survey of Graph Kernels*, P. M. Kogge, Ed., University of Notre Dame, 2019. DOI: 10.7274/r0-e7wb-da60.

Under Preparation.....

- [P2] **S. Sikdar***, A. Ghavasieh*, M. De Domenico, and S. Fortunato, "*Persistent Energy Localization Determines the Mesoscale Functional Organization of Complex Networks*," Forthcoming, 2024.
- [P1] **S. Sikdar***, S. Venturini*, M. L. Charpignon, S. Kumar, F. Rinaldi, F. Tudisco, S. Fortunato, and M. S. Majumder, "*The COVID-19 Research Outbreak: How the Pandemic Culminated in a Surge of New Researchers*," Forthcoming, 2024.




Presentations

(* virtual talk)





Invited Talks

Heritage Institute of Technology, Kolkata, India	Sep 2022
Indian Association for the Cultivation of Science, Kolkata, India	Sep 2022
University of Louisville, Louisville, KY	Mar 2022
Lawrence Livermore National Laboratory, Livermore, CA*	Apr 2021
University of Illinois, Urbana, IL*	Apr 2021
Missouri State University, Springfield, MO*	Feb 2021
South Dakota State University, Brookings, SD*	Dec 2020
Indian Association for the Cultivation of Science, Kolkata, India	Oct 2019
Vidyasagar College, Kolkata, India	Jan 2016

Posters

<i>Consistency Pays off in Science</i> . ICSSI 2023	June 2023
<i>The Infinity Mirror Test for Graph Generators</i> . SIAM NS 2020 	July 2020
<i>Modeling Graphs with Vertex Replacement Grammars</i> . SIAM NS 2019, NetSci 2019 	May 2019
<i>Synchronous Hyperedge Replacement Graph Grammars</i> . MSLD 2018 	May 2018

Other Talks

<i>Introduction to Support Vector Machines</i> 	Apr 2017
<i>Density Based Spatial Clustering of Applications with Noise</i> 	Feb 2017
<i>Introduction to Decision Trees</i> 	Nov 2016
<i>A Friendly Introduction to Random Networks</i> 	Feb 2016

Service

International Committee Leader. Postdoc Association Indiana University Bloomington Jun 2022 –

Program Committee Member

- PAKDD 2024	- WSDM 2024	- ISSI 2023
- The Web Conference 2024	- ICWSM 2024,2023,2022,2020	- BigData 2024,2019
- SDM 2024,2023,2022	- CIKM 2024,2023,2022,2021	- WISE 2019

Journal Reviewer

- Quantitative Science Studies
- Scientometrics
- EPJ Data Science
- IEEE Transactions on Knowledge and Data Engineering (TKDE)
- Journal of Combinatorial Optimization
- Physical Review E
- Physical Review Materials
- PLOS ONE
- ACM Transactions on Data Science (TDS)
- Data Mining and Knowledge Discovery (DMKD)
- International Journal Cooperative Information Systems (IJCIS)
- Journal of Logic & Computation

External Reviewer (multiple times). ICDM, CIKM, The Web Conference, WSDM, KDD, AAAI

Volunteer. The Scoop from Grad Students Dec 2019

Panelist. Preparing a Grad School Application Dec 2019

Member. Notre Dame CSE Graduate Student Board 2019 – 2020

Volunteer Judge. Northern Indiana Regional Science & Engineering Fair 2019, 2020

Chair, Vice Chair, Secretary. Heritage Institute of Technology ACM Student Chapter 2014 – 2017

Student Member. ACM 2013 –

Students Mentored

(@ indicates co-authorship in papers)

Marie-Laure Charpignon@. Ph.D. student, MIT Aug 2022 –

Sagar Kumar@. Ph.D. student, Northeastern Aug 2022 –

Arsham Ghavasieh@. Ph.D. student, University of Trento, Italy Aug 2022 –

Şirag Erkol@. Ph.D. student, IU Feb – Aug 2022

Daniel Kaiser. Ph.D. student, IU Feb – Aug 2022

Sara Venturini@. Ph.D. student, University of Padova, Italy Jan 2022 –

Manita Pote. Ph.D. student, IU Jan – May 2022

Daniel Gonzalez Cedre@. Ph.D. student, ND Dec 2019 – Aug 2020

Catalina Vajiac@. B.S. student, ND (now a Ph.D. student at CMU) Jan – Jul 2019

Justus Hibshman@. Ph.D. student, ND Sep – Dec 2018

Computer Skills

Advanced: Python, NetworkX, Matplotlib, Seaborn, Jupyter, \LaTeX

Intermediate: C++, Boost Graph Library, Pandas, SQL, shell scripting

Relevant Coursework

Scalable Graph Algorithms · Web Science & Information Retrieval · Exotic Computing · Social Networks Complexity & Algorithms · Pedagogy and Practice in the College Classroom

References

- Tim Weninger 574-631-6770
 Frank M. Freimann Collegiate Associate Professor of Engineering tweninger@nd.edu
 Department of Computer Science & Engineering
 University of Notre Dame
- Santo Fortunato 812-856-5754
 Professor santo@indiana.edu
 APS Fellow, Network Science Society Fellow
 Luddy School of Informatics, Computing, and Engineering
 Indiana University Bloomington
- Peter Kogge 574-631-6763
 Ted H. McCourtney Professor of Computer Science & Engineering kogge@nd.edu
 IBM Fellow, IEEE Fellow, AAAS Fellow
 University of Notre Dame
- Maimuna S. Majumder 617-355-6000
 Assistant Professor maimuma.majumder@childrens.harvard.edu
 Peter Szolovits Distinguished Scholar
 Computational Health Informatics Program
 Harvard Medical School & Boston Children's Hospital
- Filippo Radicchi 812-855-9322
 Professor filiradi@indiana.edu
 Luddy School of Informatics, Computing, and Engineering
 Indiana University Bloomington