

SWAPNIL DHAMAL

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RESEARCH INTERESTS

The primary areas of my research are social and economic networks, transport planning, blockchain mining, and multi-armed bandits. The topics of my general expertise are game theory, mathematical modeling, algorithms, applied probability, linear algebra, optimization, machine learning, and simulation techniques. I have experience with theoretical as well as experimental work. I am flexible with respect to the specific domain of research, and also excited and swift to pick up the specifics of a new domain.

POSTDOCTORAL EXPERIENCE

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| Postdoctoral Researcher, Chalmers University of Technology, Sweden <i>Topic</i> - Synthetic population for transport modeling <i>Advisors</i> - Sonia Yeh and Frances Sprei | Aug 2019 - present |
| Postdoctoral Researcher, Telecom SudParis (CNRS), France <i>Topic</i> - Continuous-time opinion dynamics in social networks <i>Advisors</i> - Walid Ben-Ameur and Tijani Chahed | Apr 2019 - Jun 2019 |
| Postdoctoral Researcher, INRIA Sophia Antipolis, France <i>Topic</i> - Game theoretic studies in network diffusion and blockchain mining <i>Advisors</i> - Eitan Altman, Walid Ben-Ameur, and Tijani Chahed | Nov 2017 - Feb 2019 |
| Postdoctoral Researcher, Telecom SudParis (CNRS), France <i>Topic</i> - Opinion dynamics in social networks with hostile camps <i>Advisors</i> - Tijani Chahed, Walid Ben-Ameur, and Eitan Altman | Oct 2016 - Sep 2017 |
| Research Associate, Indian Institute of Science Game Theory Lab, Department of Computer Science and Automation | May 2016 - Sep 2016 |

EDUCATION

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| Ph.D. (Engg.) Computer Science and Automation Indian Institute of Science, Bangalore - CGPA 6.52 / 8.00 <i>Topic</i> - New models and methods for formation and analysis of social networks <i>Advisor</i> - Y. Narahari | Apr 2016 |
| B.E. (Hons.) Computer Science Birla Institute of Technology and Science, Pilani, K K Birla Goa Campus - CGPA 9.01 / 10.00 | Jun 2010 |
| Maharashtra State Board Higher Secondary Certificate (HSC) - 92.33 % | Mar 2006 |
| Maharashtra State Board Secondary School Certificate (SSC) - 91.20 % | Apr 2004 |

JOURNAL PUBLICATIONS (REFEREED)

- (1) Ghalme, G., [Dhamal, S.](#), Jain, S., Gujar, S. and Narahari, Y., 2021. Ballooning multi-armed bandits. *Artificial Intelligence* (Impact Factor: 6.6), vol. 296, Art. no. 103485, pp. 1-22.
- (2) [Dhamal, S.](#), Ben-Ameur, W., Chahed, T. and Altman, E., 2020. A two phase investment game for competitive opinion dynamics in social networks. *Information Processing & Management* (Impact Factor: 4.8), vol. 57, no. 2, Art. no. 102064, pp. 1-20.
- (3) Altman, E., Menasche, D.S., Reiffers, A., Datar, M., [Dhamal, S.](#), Touati, C. and El-Azouzi, R., 2020. Blockchain competition between miners: A game theoretic perspective. *Frontiers in Blockchain* (Impact Factor: TBA), vol. 2, Art. no. 26, pp. 1-18.
- (4) [Dhamal, S.](#), Ben-Ameur, W., Chahed, T. and Altman, E., 2019. Optimal investment strategies for competing camps in a social network: A broad framework. *IEEE Transactions on Network Science and Engineering* (Impact Factor: 5.2), vol. 6, no. 4, pp. 628-645.

- (5) Dhamal, S., Vallam, R.D. and Narahari, Y., 2019. Modeling spread of preferences in social networks for sampling-based preference aggregation. *IEEE Transactions on Network Science and Engineering* (Impact Factor: 5.2), vol. 6, no. 1, pp. 46-59.
- (6) Dhamal, S., Prabuchandran, K.J. and Narahari, Y., 2016. Information diffusion in social networks in two phases. *IEEE Transactions on Network Science and Engineering* (Impact Factor: 5.2), vol. 3, no. 4, pp. 197-210.
- (7) Dhamal, S. and Narahari, Y., 2015. Formation of stable strategic networks with desired topologies. *Studies in Microeconomics* (Impact Factor: 0.2), vol. 3, no. 2, pp. 158-213.

CONFERENCE PUBLICATIONS (REFEREED)

- (1) Ghalme, G., Dhamal, S., Jain, S., Gujar, S. and Narahari, Y., 2020. Ballooning multi-armed bandits. In *International Conference on Autonomous Agents & Multiagent Systems (AAMAS)*, pp. 1849-1851.
- (2) Dhamal, S., 2019. An integrated framework for competitive multi-channel marketing of multi-featured products. In *IEEE International Conference on Communication Systems & Networks (COMSNETS)*, pp. 391-394.
- (3) Altman, E., Reiffers, A., Menasche, D.S., Datar, M., Dhamal, S. and Touati, C., 2019. Mining competition in a multi-cryptocurrency ecosystem at the network edge: A congestion game approach. *ACM SIGMETRICS Performance Evaluation Review (PER): Symposium on Cryptocurrency Analysis*, vol. 46, no. 3, pp. 114-117.
- (4) Dhamal, S., Ben-Ameur, W., Chahed, T. and Altman, E., 2018. Resource allocation polytope games: Uniqueness of equilibrium, price of stability, and price of anarchy. In *AAAI Conference on Artificial Intelligence (AAAI)*, pp. 997-1006.
- (5) Dhamal, S., Ben-Ameur, W., Chahed, T. and Altman, E., 2018. Optimal multiphase investment strategies for influencing opinions in a social network. In *International Conference on Autonomous Agents & Multiagent Systems (AAMAS)*, pp. 1927-1929.
- (6) Dhamal, S., 2018. Effectiveness of diffusing information through a social network in multiple phases. In *IEEE Global Communications Conference (GLOBECOM)*, 7 pages.
- (7) Dhamal, S., Ben-Ameur, W., Chahed, T. and Altman, E., 2018. Manipulating opinion dynamics in social networks in two phases. In *Joint International Workshop on Social Influence Analysis and Mining Actionable Insights from Social Networks (SocInf + MAISoN), workshop with IJCAI-ECAI*, 7 pages.
- (8) Mondal, S., Dhamal, S. and Narahari, Y., 2017. Two-phase influence maximization in social networks with seed nodes and referral incentives. In *International AAAI Conference on Web and Social Media (ICWSM)*, pp. 620-623.
- (9) Dhamal, S., Prabuchandran, K.J. and Narahari, Y., 2015. A multi-phase approach for improving information diffusion in social networks. In *International Conference on Autonomous Agents & Multiagent Systems (AAMAS)*, pp. 1787-1788.
- (10) Dhamal, S. and Narahari, Y., 2013. Scalable preference aggregation in social networks. In *AAAI Conference on Human Computation and Crowdsourcing (HCOMP)*, pp. 42-50.
- (11) Dhamal, S. and Narahari, Y., 2012. Forming networks of strategic agents with desired topologies. In *International Conference on Internet and Network Economics (WINE)*, pp. 504-511.
- (12) Dhamal, S., Bhat, S., Anoop, K.R. and Embar, V., 2011. Pattern clustering using cooperative game theory. In *Centenary Conference, Electrical Engineering, Indian Institute of Science*, pp. 653-658.

TEACHING EXPERIENCE

- Teaching Assistant, *Game Theory*, Indian Institute of Science. 5 terms, 2012-2016.
- Teaching Assistant, *Algorithms and Programming*, Indian Institute of Science. 3 terms, 2011-2013.

PROFESSIONAL EXPERIENCE

- Designer & Co-developer, *Facebook App - The Perfect Representer*. 2014-2015.
- IISc Project Coordinator, Collaboratory with *Adobe Research Labs, Bangalore*. 2013-2016.

MENTORING EXPERIENCE - MASTER'S PROJECTS

- (1) Mondal, Sneha, *M.Sc. Computer Science and Automation, Indian Institute of Science. 2015-2016.*
A referral-reward embedded bi-phase information diffusion technique.
- (2) Akotiya, Surabhi, *M.E. Computer Science and Automation, Indian Institute of Science. 2014-2015.*
Multi-phase information diffusion in social networks.
- (3) Gupta, Shaifali, *M.E. Computer Science and Automation, Indian Institute of Science. 2014-2015.*
Multi-campaign influence maximization in social networks.
- (4) Meghlan, Akanksha, *M.E. Computer Science and Automation, Indian Institute of Science. 2013-2014.*
Preference modeling and aggregation in social networks.

MENTORING EXPERIENCE - GRADUATE COURSE PROJECTS (GAME THEORY)

- (1) Preference modeling using Facebook data. 2015.
- (2) Multi-phase information diffusion in social networks. 2014. (*1st prize winner*)
- (3) Preference modeling in social networks. 2014. (*2nd prize winner*)
- (4) Simulation of the repeated prisoner's dilemma problem. 2013. (*2nd prize winner*)
- (5) Determining ordering of link creations in social network formation. 2013.
- (6) Influence limitation in multi-campaign social networks. 2013.
- (7) Myerson value and extension for influence in social networks. 2012.

PROJECTS & INTERSHIPS

Graduate Projects

- Pattern clustering using cooperative game theory. Jan-Apr 2011. (*2nd prize winner*)
- Multiagent influence diagrams approach for solving games. Jan-Apr 2011.

Undergraduate Internships

- *NetApp, Bangalore.* WAFL Filesystem Development Team. Jan-Jun 2010.
- *The TATA Power Company, Mumbai.* IT Department. May-Jul 2008.

Undergraduate Projects

- Illumination and animation techniques using OpenGL. Aug-Nov 2009.
- 3D Bezier curve plotter using OpenGL. Aug-Nov 2009.
- 3D animation production using Maya and Premiere. Jan-Apr 2009.
- 2D animated clip using Flash, Photoshop, and Premiere. Aug-Nov 2008.

SELECTED TALKS (APART FROM ARCHIVAL CONFERENCES)

- (1) A two phase investment game for competitive opinion dynamics in social networks. 2020. *Adaptive and Learning Agents (ALA), workshop with AAMAS*, Virtual meet.
- (2) Optimal investment strategies for competing camps in a social network. 2019. *International Network Optimization Conference (INOC)*, France.
- (3) A framework for investment strategies for competing camps in social network. 2017. *Gaspard Monge Program For Optimization, Operations Research and Interactions with Data Sciences (PGMO Days)*, France.
- (4) A zero-sum game for opinion dynamics in a social network. 2017. *European Meeting on Game Theory (SING13)*, France.
- (5) Multi-phase information diffusion in social networks. 2016. *ICTS Meeting on Games, Epidemics and Behavior*, India.
- (6) Models and methods for formation and analysis of social networks. 2016. *ACM Inter-Research-Institute Student Seminar in Computer Science (IRISS)*, India.
- (7) Scalable preference aggregation in social networks. 2013. *International Workshop on Socio-Economic Network System*, India.
- (8) Sufficient conditions for formation of network topology by self-interested agents. 2012. *International Conference on Game Theory, Operations Research & Applications (GTORA)*, India.

COMPUTER SKILLS

- *Languages* - Python, Matlab, C.
- *Tools* - Gephi, AutoCAD, OpenGL, Maya, Photoshop, Premiere, Flash.

ACHIEVEMENTS

- IBM Ph.D. Fellowship (2013-2015).
- Graduate Aptitude Test in Engineering - 99.48 percentile (2010).
- National Talent Search Scholarship (2004-2010), Middle & High School Scholarships (1998-2004).

CO-CURRICULARS

- Designer & Creator of several posters for Department of CSA, IISc Bangalore.
- 2nd runner-up, *Hackathon (Data Science Student Challenge)* - *Pravega '16*, IISc Bangalore.
- 2nd runner-up, *Bob The Builder (Structuring Competition)* - *Quark '08*, BITS Pilani Goa campus.
- Participant, *Trashoholic (Contraption Building Competition)* - *Quark '08*, BITS Pilani Goa campus.
- Participant, *Pixel (Image Processing Competition)* - *Techfest '08*, IIT Bombay.

REFERENCES

Prof. Y. Narahari

Chairman,
Division of Electrical Sciences,
Indian Institute of Science, Bangalore.
narahari@iisc.ac.in

Dr. Eitan Altman

Senior Researcher,
Network Engineering and Operations Team,
INRIA Sophia Antipolis, France.
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Prof. Tijani Chahed

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Networks & Telecom Services Department,
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Prof. Walid Ben-Ameur

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