

I am a researcher with expertise in machine learning and its applications. Currently, I am working as a postdoctoral research fellow in the University of Surrey, and am looking for relevant positions.

Education

- 2012–20 PhD – Machine Learning; Hypergraphs, *Indian Institute of Science (IISc), Bangalore, India.*
Thesis title: *Hypergraph Network Models: Learning, Prediction, & Representation in the Presence of Higher-Order Relations*
- Solved problems involving “higher-order relations” in network science through “hypergraphs”.
 - *Hypergraphs and Link Prediction (LP)*: Questions answered: How hypergraphs affect LP in derived-networks? ◦ How to readjust evaluation criteria for LP? ◦ Transformed LP scores to hypergraphs ◦ Carefully prepared LP data ◦ Performed extensive LP experiments
 - *Higher-order Link Prediction (HLP)*: Established intractability of HLP ◦ Showed that Negative Sampling hugely impacts HLP ◦ Proposed benchmark algorithms ◦ Hypothesized & statistically tested: cliques form hyperedges ◦ Fused hypothesis into objective: C3MM model ◦ Introduced sub-higher-order & proposed sub-optimal heuristic ◦ Deep attention HLP: SHONeNs
 - *Bipartite Higher-order Link Prediction (BHLP)*: Introduced higher-order bipartiteness for the first time ◦ Formulated powerset matching ◦ Rigorously connected them ◦ Segregated cross-attention params ◦ Built a deep model: CATSETMAT ◦ Solved BHLP via CATSETMAT
- 2010–12 Master of Science (Engg.) – Machine Learning; Natural Language Processing, *IISc, Bangalore, India.*
Thesis title: *Sentiment-driven Topic Analysis of Song Lyrics*
- Automatically assigned “sentiment topics” to songs based on their lyrics using “topic models”.
 - Mined textual data ◦ Crawled & merged multiple corpora ◦ Handled synonymous/polysemous words ◦ Latent Dirichlet Allocation ◦ WordNet ◦ SentiWordNet
- 2006–10 Bachelor of Engineering – Electrical & Electronics, *CGPA 8.72/10.*
Manipal Institute of Technology, Manipal, Karnataka, India
- 2002–05 Class X & XII, *Central Board of Secondary Education, 72.8% & 77.2%.*
Nirmal Deepmala School, Rishikesh, Uttarakhand, India

Work Experience

- 2021-present Postdoctoral Research Fellow, *University of Surrey, Guildford, UK.*
- My research here focuses on ‘dental disease detection’ in specific and deep computer vision in general.
 - I am also involved with (co-)mentoring graduate and undergraduate students.
 - Apart from performing research, I am also helping build a production-level end-to-end dental disease detection system with crowdsourcing capabilities.
- 2020–2021 Data Scientist, ~1 year, *Factors.Ai, Slashbit Technologies Pvt. Ltd., Bangalore, India.*
- Designing and developing products for automated marketing analytics.
 - Extracting intelligent marketing insights from large datasets via multivariate data mining.
- 2018–19 Senior Data Scientist, 1.5 years, *MiQ Digital India, Bangalore, India.*
- Design and production of ad-tech based products and solutions, both internal and external
 - Process/analyze ad-tech data build quick-PoCs; data ingestion and processing.

Teaching/Training/Internship Experience

- Teaching Linear Algebra (2017), *NPTEL, Ministry of HRD, Govt. of India.*
Assistance Discrete Structures (2014), *CSA, IISc, Bangalore, India.*
- Teaching Design and Analysis of Algorithms (2013), *Wipro Bangalore & VIT Vellore, India.*
- Industrial Training *Machine/Deep Learning in Software (2020), Deep Learning for Web (2019), Machine Learning for Communication Networks (2019), Advanced Algorithms & Programming (2017), Data Structures & Algorithms (2016), Data Clustering Techniques (2018), Mathematics in Data Science (2019), Foundations of Deep Learning (2019), Statistical Data Analysis (2014)* *Softwaves Consultancy Bangalore Pvt. Ltd., Bangalore, India.*
- 2016–17 Research Intern, 1 year, *Wipro Technologies, Bangalore, India.*
Automating IT Service Management Systems
- 2010 Project Intern, 0.5 years, *CAIR, Defence Research & Development Organization (DRDO), Bangalore, India.*
Topic Detection and Clustering of Multiple Documents

Guildford, United Kingdom

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 [LinkedIn](#)

 [GitHub](#)

 [Google Scholar](#)

Research Areas/Interests

- Primary Machine/Deep Learning Theory/Applications ◦ Network Science ◦ Higher-order Relations ◦ Hypergraph Networks ◦ Network Embedding ◦ Natural Language Processing ◦ Computer Vision ◦ Explainable AI
- Secondary Online Advertising ◦ Recommendation Systems ◦ Information Retrieval ◦ Statistical Learning Theory ◦ Reinforcement Learning ◦ Stochastic Algorithms ◦ Machine Learning in Life Sciences ◦ Computational Neuroscience

Technical and Academic Skills

- Languages & Technologies C ◦ C++ ◦ Python ◦ GoLang ◦ MATLAB ◦ R ◦ Java ◦ Pandas ◦ NumPy ◦ SkLearn ◦ NLTK ◦ TensorFlow ◦ Keras ◦ PyTorch ◦ Git ◦ Spark ◦ Jupyter ◦ MATLAB Coder ◦ Unix ◦ AWS ◦ OpenCV ◦ TensorflowLite
- Mathematical proficiency Linear Algebra ◦ Optimization ◦ Probability & Statistics ◦ Graphs & Hypergraphs ◦ Real Analysis ◦ Discrete Mathematics & Number Theory ◦ Calculus ◦ Mathematical Logic

List of Publications

- Published - G. Sharma, P. Patil, and M. N. Murty, *C3MM: Clique-Closure based Hyperlink Prediction*, Int. Joint Conf. on Artificial Intelligence, 2020, Japan.
- " - P. Patil, G. Sharma, and M. N. Murty, *Negative Sampling for Hyperlink Prediction in Networks*, Pacific-Asia Conf. on Knowledge Discovery and Data Mining, 2020, Singapore.
- " - G. Sharma and M. N. Murty, *Mining Sentiments from Songs using Latent Dirichlet Allocation*, Intelligent Data Analysis, 2011, Portugal.
- " - D. Deodhare, G. Sharma, A. Srivastava, A. Sharma., *Semantically Driven Soft-clustering of Documents using Lexical Chains*, Int. Conf. on Natural Language Processing, 2010, India.
- Preprints - G. Sharma, P. Gupta, and M. N. Murty, *Love tHy Neighbor: Remeasuring Local Structural Node Similarity in Hypergraph-derived Networks*, arXiv 2021.
- " - G. Sharma, A. Challa, P. Gupta, and M. N. Murty, *Higher Order Relations Skew Link Prediction in Graphs*, arXiv 2021.
- " - G. Sharma, S. Singh, V. S. Devi, and M. N. Murty, *The CAT SET on the MAT: Cross Attention for Set Matching in Bipartite Hypergraphs*, arXiv 2021.
- " - G. Sharma, P. Patil, and M. N. Murty, *SHONeNs: Sub-higher-order Neural Networks for Hyperedges*, (PDF available on demand).


Graduate-level Courses attended

- 2010–2018 Linear Algebra ◦ Optimization ◦ Real Analysis ◦ Probability & Statistics ◦ Information Retrieval ◦ Probabilistic Graphical Models ◦ Cognition & Machine Intelligence ◦ Natural Language Understanding ◦ Topics in Pattern Recognition ◦ Discrete Structures ◦ Information Theory ◦ Automated Verification ◦ Foundations of Data Science

Miscellaneous

- Achievements *Best Newcomer*, 2019, MiQ, Bangalore, India.
Scholarship for Research, 2010–17, Min. of Human Resource Devt., Govt. of India.
- Initiatives *Learn Deep Learn*, Reading Group, 2019, MiQ, Bangalore, India.
Mathematics Discussion Club, Discussion Group, 2011–12, IISc, Bangalore, India.
- Volunteer *CSA Summer School & Web Team*, 2013–14, " .
CSA Dept. Curriculum Committee (Student Member), 2011–12, " .
- Talks *Matrix Factorization Techniques*, 2015, CSA Summer School, " .
Careers after Engineering, 2014, Manipal Institute of Technology, Manipal, India.
Mathematics for Computer Science, 2013, CSA, IISc, Bangalore, India.
- Hobbies *Programming, Movies, Documentaries, Poetry, Mentoring, Science Reading.*

Guildford, United Kingdom

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References

- Academia [Dr. M. Narasimha Murty](#), *Honorary Professor, IISc, Bangalore, India*, [✉ mnm@iisc.ac.in](mailto:mnm@iisc.ac.in),
[Dr. Yunpeng Li](#), *Senior Lecturer, University of Surrey, UK*, [✉ yunpeng.li@surrey.ac.uk](mailto:yunpeng.li@surrey.ac.uk),
[Dr. Dilip P. Patil](#), *Professor, IISc, Bangalore, India*, [✉ patil@iisc.ac.in](mailto:patil@iisc.ac.in),
[Dr. C. E. Veni Madhavan](#), *Professor (Retired), IISc, Bangalore, India*, [✉ cevm@iisc.ac.in](mailto:cevm@iisc.ac.in).
- Industry [Mr. Srikrishna Swaminathan](#), *Co-Founder & CEO, Factors.AI, Bangalore, India*, [✉ srikrishna@factors.ai](mailto:srikrishna@factors.ai),
[Mr. Aravind Murthy](#), *Founder & CTO, Factors.AI, Bangalore, India*, [✉ aravind@factors.ai](mailto:aravind@factors.ai),
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[Dr. Anshuman Gupta](#), *VP Data Science, MiQ, Bangalore, India*, [✉ anshuman@miqdigital.com](mailto:anshuman@miqdigital.com).