Curriculum Vitae of Ranjan Pal, Ph.D

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Research Vision My research vision is to realize using the interplay of management science, applied mathematics, technology, and policy - an enterprise world where *every* inter-networked enterprise and their supply chain ecosystems can seamlessly and cost-effectively manage cyber risks, while being cyber resilient.

Academic Positions
Research Scientist, MIT Sloan School of Management, **MIT** [January 2023 - Present]
Assistant Research Scientist, EECS, **University of Michigan Ann Arbor** [2019 - 2022]

Affiliate Positions
Working Group Member (Cyber Resilience), **World Economic Forum** [April 2023 - Present]
Affiliate, **Trust and Technology Initiative**, **University of Cambridge**, [[1]F'2018 - F'2022]
Affiliate Faculty, **Michigan Institute for Data Science** (MIDAS) [F'2020 - F'2022]

Research Appointments (Short Visits)
Indian Institute of Management Ahmedabad (IS, Operations Research), SM'2022, SP'2025
Indian School of Business (Information Systems), CLMP Research Fellow, F'2022
Tsinghua University (Electrical Engineering), SM'2019
King's College London (Mathematical Sciences), SM'2019
Indian Institute of Technology Delhi (Computer Science, Management Studies) SM'2017
Indian Institute of Technology Delhi (Electrical Engineering), SM'2018
Indian Institute of Management Ahmedabad (Economics, Operations Research), SM'2018
University of Helsinki (Computer Science), SP'2018
Indian Institute of Technology Delhi (Computer Science, Management Studies) SM'2017
Indian Institute of Management Calcutta (Operations Research), SM'2017
Hong Kong University of Science and Technology (Computer Science), SM'2017

Research Focus *Solving complex, multi-disciplinary cybersecurity issues via computer, decision, & the data sciences.* I research on (systemic) cyber risk/resilience management in enterprises and their interdependent service networks built upon critical infrastructure driven by IT/IoT information systems. I pioneer mathematical/algorithmic theories guiding cyber-risk/resilience management for such enterprises; their supply chain ecosystems, and validate the theories using system simulation and survey science.

Postdoc Fellow (2015-2018) **University of Southern California** (ECE); Visiting Fellow **University of Cambridge** (CS)
Viterbi Fellow researching new QoS theory for energy (security) applications, and PII markets.

PhD Education **University of Southern California (USC)**, Los Angeles, California, USA, (2008-2014)

Ph.D. (December, 2014), Computer Science, Provost Ph.D. Fellow (Highest Graduate Honor)

- Thesis: *Improving Network Security Through Insurance: A Tale of Cyber-Insurance Markets*
- Thesis Advisors: Leana Golubchik (CS), Konstantinos Psounis (ECE)
- Other Committee Members: Viktor Prasanna (ECE), Minlan Yu (CS@Harvard University)

PhD Internships
Visiting Student Research Scholar (VSRC Program[2], **Princeton University (SEAS)**, 2010-2011
Research Intern, **Deutsch Telekom Labs, Berlin** (with Anja Feldmann/Pan Hui), SM'2011/12
Research Intern, **Ciena Corporation (Cyan SDN Division)** (with Zsolt Haraszti), SM'2013
Research Visitor, **Aalborg University (EE), SDR Team** (hosted by Ramjee Prasad), SM'2009

[1] SP - Spring, SM - Summer, F - Fall
[2] I studied content sharing economics with Mung Chiang & Vince Poor; had the privilege talking to John Nash.

Pre-Doctoral Education

University of California Davis, Davis, California, USA, (2005-2007)

M.S. (April, 2007), Computer Science, Graduate Fellow

- Research: *Load Balancing and Edge Criticality Ranking Schemes for Reliable Networking*
- Mentor: Chen-Nee Chuah (ECE)

National University of Singapore, MIT, Singapore/Cambridge (USA), (2004-2005)

M.S. (July, 2005), Computer Science, Singapore-MIT Alliance Fellow

- Research: *Optimal RAC-BCL2 Protein Docking Structures using Unsupervised Learning*
- Mentor: David Hsu (NUS), Tomas-Lozano Perez (MIT)

Birla Institute of Technology Mesra, Ranchi (India), (1998-2002)

B.E. (June, 2002), Computer Science and Engineering

- Research: *Fuzzy Linear Programming Methods to Optimize System Design and Performance*
- Mentor: Sandip Datta (BIT Mesra), Somprakash Bandyopadhay, Asim Pal (IIM Calcutta)

Pre-Doctoral Experience

Research Intern[3], **Aalborg University**, Denmark (Electrical Engineering, CTiF), SM'2008
Research Intern[4], **Indian Institute of Management Calcutta** (Operations Research), SM'2006
Research Intern[5], **Indian Institute of Management Calcutta** (Operations Research), SM'2001
Software Engineer, *Formal Verification Group*, **Cadence Design Systems**, Delhi NCR, 2002-2004

Teaching Activities

UMichigan (ECE) - Mathematical and Socio-Economic Methods for Cyber-Governance, F'2020/21
USC (CS) - Application of Cryptography to Information Security Problems, F'2016
IIT Delhi (EE, CS) - Game Theory Models for Distributed Network Optimization, SM'2017
IIT Delhi (DMS) - Game Theory Models for Corporate Decision Making, SM'2017
IIM Ahmedabad (IS, OR, Econ) - Network Game Theory, SM'2018
IIM Calcutta (IS, OR, Econ) - Network Game Theory, SM'2017
Teaching Assistant@USC (CS) - Analysis of Algorithms (Graduate), F'2010 - SP'2013

Vedic Astrology Education

Dev Jyotish, Gurgaon, India

Certification in *Introductory Vedic Astrology* (2023)

- Course Instructor: Dr. Richa Shukla (Professional Astrologer)

Certification in *Nakshatra Jyotish* (2023)

- Course Instructor: Dr. Richa Shukla (Professional Astrologer)

Certification (also a Teaching Assistant) in *Advanced Vedic Astrology* (2024)

- Course Instructor: Dr. Richa Shukla (Professional Astrologer)

Ranjan Pal is trained, equivalent of *Jyotish Alankar* and *Jyotish Acharya* in Parashari *Jyotish*.

Graduate Coursework

Analysis of Algorithms
Artificial Intelligence
Applied Cryptography
Computer Security and Data Privacy
Computer and Communication Networks
Cybersecurity
Distributed Systems
Mobile and Wireless Networks
Network Economics and Game Theory

[3]Reliability analysis in Dynamic Spectrum Access (DSA) networks.
[4]Multi-objective mobile Internet traffic management using lexicographic (integer) optimization methods.
[5](Fuzzy) linear programming and Analytic Hierarchy Process to optimize performance of networks and systems.

Probability Theory and Its Applications
Stochastic Processes
Machine Learning and Graphical Models
Randomized Algorithms
Optimization Theory (for Real and Vector Spaces)
Economics of Information Security
Performance Modeling of Computer Information Systems
Enterpreneurship

Post-Graduate Honors (Selected)

Best Research Mentor award nomination at MIT, Academic Year 2024-2025
Best Paper award nomination in Theory, Application categories of the Winter Simulation Conference, 2024
Best Paper award nomination in the Application category of the Winter Simulation Conference, 2023
Selected in the expert cybersecurity review panel of the US National Science Foundation (NSF), 2024
Awarded CLMP Visiting Faculty Fellowship, Indian School of Business, 2022
Invited as a cyber-risk and cyber-insurance expert to the prestigious Dagstuhl Seminars, Germany, 2021
Awarded Viterbi Postdoctoral Fellowship from USC to conduct **independent research**, 2015
Among the TOP FIVE TAs in the Viterbi School of Engineering[6] at USC, AY: 2011-2012
5-Year Provost PhD Fellowship from USC, 2008 [Awarded to $\approx 5\%$ of all USC PhD entrants of 2008]
1-Year SMA Fellowship for MS study in EECS, jointly from MIT and NUS, 2004 [30/282 applicants awarded]
2-Year Graduate Fellowship from ECE@CMU for PhD study, 2008 (Declined)
2-Year Graduate Fellowship from CS@UC Irvine for PhD study, 2008 (Declined)
Scholarships for PhD Study in UMD College Park (ECE), IIM-Ahmedabad (OR), 2004 (Declined)
2-Year Graduate Scholarship from Columbia University (CS) to pursue MS studies, 2004 (Declined)

'Junior' Speaker

INFORMS Annual Meeting 2001 (**Three talks on Fuzzy-LP applications as a 3rd-year UG Student**)

Contributed Talks

INFORMS Annual Meeting 2001, 2020
SIAM Annual Meeting 2012, 2021
SIAM Conference on Financial Mathematics and Engineering 2012, 2021

Professional Memberships

Member of the IEEE
Member of the ACM
Member of the American Mathematical Society (AMS)
Member of the Game Theory Society
Member of the Society for Industrial and Applied Mathematics (SIAM)
Member of the Institute for Operations Research and Management Sciences (INFORMS)

Editorial Duties

Associate Editor - ACM Transactions on Management Information Systems [2020 - Current]
Technical Program Committee (TPC) Member - Winter Simulation Conference, 2025

Professional Activities (Reviewer)

MIS Quarterly Executive
Nature Scientific Data
IEEE Transactions on Communications
IEEE Transactions on Parallel and Distributed Systems
IEEE Transactions on Mobile Computing
IEEE Transactions on Services Computing
IEEE Access
IEEE Transactions on Cloud Computing
IEEE Transactions on Network Science and Engineering
IEEE Journal on Selected Areas in Communications
Theoretical Computer Science (Elsevier)
European Journal of Operations Research (Elsevier)
Cambridge Data and Policy Journal (Cambridge University Press)
Performance Evaluation (Elsevier)

[6] Award received for *Analysis of Algorithms* (Graduate Level) offered by the Computer Science department.

Oxford Journal of Cybersecurity
IEEE Transactions on Industrial Informatics
IEEE Transactions on Information Forensics and Security
IEEE Transactions on Sustainable Computing
IEEE Wireless Communications Letters
ACM Transactions on Management Information Systems
ACM Transactions on Internet Technology
Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies
ACM Journal on Digital Threats: Research and Practice
Winter Simulation Conference
ACM SIGMETRICS
IEEE INFOCOM
IEEE ICDCS
AIS ICIS,
AIS AMCIS

Industry Consulting

Technical Advisor (Cyber-Risk Analysis) - **QxBranch LLC**, (2016 - 2019)
Technical Advisor (Cyber-Risk Analysis) - **Accel**, (2015-2015)

Other Service

National Association of Insurance Commissioners (NAIC), USA - Invited Expert, 2016
National Science Foundation (NSF), USA - Invited Review Panel Expert, 2025
'Reference Letter' writer for US Green Card (EB1, EB2) and O-1 applicants

University Service (2019-Current)

Massachusetts Institute of Technology, USA

1. Committee Member, AI and Cyber Event, 2025 (hosted by MIT CAMS)
2. Organizer, 2024 CAMS Workshop on Data Analytics for Supply-Chain Cyber-Resilience Management
3. Committee Member, CCIS 2023, 2024 (hosted annually by MIT CAMS)
4. Committee Member, Quarterly MIT CAMS OT/ICS Subgroup Meetings
5. Committee Member, MIT CAMS Annual Fall Workshop, 2023
6. Host and Coordinator, MIT CAMS Weekly Research Seminar Series

University of Michigan Ann Arbor, USA

1. Served on interview panels for incoming ECE faculty candidates
2. Served on non-evaluative interview panels for incoming university-wide faculty candidates
3. Served as judge for the College of Engineering (CoE) Hugh Rumler Award,
4. Served as judge for the College of Engineering (CoE) Engineering Research Symposium (ERS)
5. Served as a reviewer of applications for incoming Ph.D students
6. Served as a GRIN mentor
7. Served as an MWIN mentor

Students@MIT (Research)

Cynthia Zhang, **Electrical Engineering@EECS** (Ongoing)
Konnie Duan, **Computer Science@EECS, Minor in Mathematics** (Ongoing)
Tilek Azkerbekov, **Mathematics, EECS** (Ongoing)
Lillian Bluestein, **Computer Science@EECS** (Ongoing)
Yaphet Lamiesa, **Electrical Engineering@EECS** (Ongoing)
Canon Robins, **Computer Science@EECS** (Ongoing)
Darren Yao, **Computer Science@EECS** (Ongoing)
Luisa Pan, **Electrical Engineering@EECS** (Ongoing)
Douglas Granillo, **Computer Science@EECS** (Ongoing)
May Al-Mousa, **Postdoctoral Fellow, MIT Sloan** (Ongoing)

Students@UM (Research)	Peihan Liu **(Graduate School, Harvard (CS))**, *Declined* - Yale, UChicago, Cornell, NYU, USC Yushi She **(Graduate School, GaTech (CS))**, *Declined* - USC, Cornell, Michigan Rohan Sequeira **(Graduate School, Viterbi Fellow USC (ECE))** *Declined* - Purdue Taoan Lu **(Graduate School, CMU (Mathematical Finance))**, *Declined* - NYU, Cornell, UMich, National University of Singapore, Nanyang Technological University, USC, Imperial College London Zhehong Wu **(Graduate School, UofM (ECE))**, *Declined* - UIUC, Columbia, NYU, Northwestern, USC Yifan Dong **(Graduate School, UofM (ECE))**, *Declined* - UC Berkeley, Georgia Tech, Cornell, UPenn, UCSD, USC, Columbia Ziyuan Huang **(Graduate School, UofM (ECE))**, *Declined* - UC Berkeley, UCSD, Cornell Xinlong Yin **(Graduate School, Georgia Tech (CS))** *Declined* - USC, UofM Yixuan Wang **(Graduate School, CMU (CS))**, *Declined* - Columbia Junhui Li **(Graduate School, CMU (CS))** *Declined* - USC Harshith Nagubandi (MS Candidate, **transferred** to **Graduate School**, **UCSD (ECE))** Vineeth Kotala **(Graduate School, UIUC (Mathematical Finance))** Sanjana Prabhu **(Graduate School, CMU (ECE))**, *Declined* - Columbia, UMass Amherst Charles Light **(Industry, Silicon Labs)** Yufei Zhu **(Graduate School, UofM (ECE))**, *Declined* - UCSD
Students@USC/IIT	Mentored Sung-Han Lin in his **CS** PhD (now at **Facebook/Meta**) with Leana Golubchik at USC. Mentored Chien-Lun Chen in his **ECE** PhD (now at **Amazon**) with Leana Golubchik at USC. Mentored Aditya Ahuja in his **CS** PhD (now at **TCS Research Labs**) with Vinay Ribeiro at IIT Delhi.
Book Reviewing	*Performance Modeling and Design of Computer Systems* - **Cambridge University Press**
Industry Liason (Invited)	Invited expert on cybersecurity to speak with executives of *Michelin Tyres*.

Talk Invitations (Venue & Topic)

1. **US Department of Homeland Security, CISA**, USA #1 - *AI and Cybersecurity*, 2025
2. **US Department of Homeland Security, CISA**, USA #2 - *AI and Cybersecurity*, 2025
3. **Johns Hopkins, Applied Physics Laboratory**, USA - *AI and Cybersecurity*, 2025
4. **MIT CAMS Anniversary Event**, Cambridge, USA - *Cyber-Risk Management*, 2025
5. **Indian Institute of Management**, Ahmedabad, India - *Cyber Resilience Management*, 2025
6. **All India Institute of Medical Science**, Jodhpur, India - *AI in Healthcare*, 2025
7. **MIT Sloan School of Management**, Cambridge, USA - *Cyber Risk Management*, 2024
8. **American Insurance Group (AIG)**, Cambridge, USA - *Cyber-Risk Management*, 2024
9. **MIT Sloan School of Management**, Cambridge, USA - *Cyber-Resilience Optimization*, 2024
10. **Cybersecurity at MIT Sloan Members Meet**, Cambridge, USA - *Cyber-Resilience Metrics*, 2023
11. **Cybersecurity at MIT Sloan Medical SIG**, Cambridge, USA - *Cyber-Resilience Metrics*, 2023
12. **Academy of Hospital Administration**, Noida, India - *Hospital Cyber-Risk Management*, 2023
13. **Massachusetts Institute of Technology**, Cambridge, USA - *Cyber-Risk Management*, 2022
14. **Indian Institute of Management**, Ahmedabad, India - *Cyber-Risk Management*, 2022
15. **Indian School of Business**, Hyderabad, India - *Cyber-Risk Management*, 2022
16. **Indian School of Business**, Hyderabad, India - *Personal Data Markets*, 2022
17. **University of Michigan (*Tech for Social Good* Panelist)**-*Privacy Management*, 2020
18. **Schloss Dagstuhl**, Saarland, Germany - *Cyber-Risk Management*, 2021
19. **University of Michigan**, Ann Arbor, USA - *Privacy Management*, 2020
20. **INFORMS Business Analytics 2020**, Denver, USA - *Privacy Management*, 2020 **(Non-Contributed)**
21. **INFORMS Security 2020**, Monterey, USA *Cyber-Risk Management*, 2020 **(Non-Contributed)**
22. **INFORMS Security 2020**, California, USA - *Privacy Management*, 2020 **(Non-Contributed)**
23. **Google Cloud**, California, USA - *Resource Sharing Economics of Boutique Clouds*, 2020

24. **University of Cambridge**, Cambridge, UK - *Privacy Management*, 2018
25. **Alan Turing Institute**, London, UK - *Privacy Management*, 2018
26. **University of Oxford**, Oxford, UK - *Privacy Management*, 2018
27. **University College London**, London, UK - *Privacy Management*, 2018
28. **Imperial College**, London, UK - *Privacy Management*, 2018
29. **Tsinghua University**, Beijing, China - *Privacy Management*, 2019
30. **King's College London**, London, UK - *Privacy Management*, 2018
31. **King's College London**, London, UK - *Cyber-Risk Management*, 2018
32. **LSE**, London, UK - ***Invited Discussion*** *on Cyber-Security and Privacy Economics*, 2018.
33. **Queen Mary University of London**, London, UK - *Privacy Management*, 2018
34. **Nokia Bell Labs**, Helsinki, Finland - *Cyber-Risk Management*, 2018
35. **University of Southern California**, Los Angeles, USA - *Cyber-Risk Management*, 2017
36. **Hong Kong University of Science and Technology**, Hong Kong - *Cyber-Risk Management*, 2017
37. **Indian Institute of Technology**, Delhi, India - *Cyber-Risk Management*, 2019, 2018, 2017, 2016
38. **Indian Institute of Management**, Calcutta, India - *Cyber-Risk Management*, 2019
39. **Indian Institute of Management**, Ahmedabad, India - *Cyber-Risk Management*, 2018
40. **Michigan State University (Criminology)**, Lansing, USA - *Cyber-Risk Management*, 2017
41. **New York University**, New York, USA - *Cyber-Risk Management*, 2015
42. **IBM Research Labs**, India, USA - *Cyber-Risk Management*, 2014
43. **Deutsch Telekom Innovation Labs (T-Labs)**, California, USA - *Cyber-Risk Management*, 2013
44. **Ciena Corporation (Blue Planet Division)**, California, USA - *Cyber-Risk Management*, 2013
45. **Deutsch Telekom Innovation Labs (T-Labs)**, Berlin, Germany - *Cyber-Risk Management*, 2013
46. **Symantec Research Labs**, California, USA - *Cyber-Risk Management*, 2012
47. **Princeton University**, New Jersey, USA - *Cyber-Risk Management*, 2010
48. **EPFL**, Lausanne, Switzerland - *Smart Grid Pricing*, 2011
49. **Nokia-Siemens Networks/IST**, Lisbon, Portugal - *Cyber-Risk Management*, 2009

PUBLICATIONS (BUSINESS LEADERSHIP)

1. **R. Pal***, and B. Nag: How to Manage Cyber Risk in AI LLM-driven Pharmaceutical Supply Chains.
   Venue: *Forbes(I), June 11*, 2025, Mentioned in **MIT Sloan in the News**.

2. C. Zhang*, **R. Pal***, and B. Nag: How to Manage GenAI Cyber Risk in Industrial Control Systems.
   Venue: *Forbes(I), May 9*, 2025.

3. **R. Pal***, S. Zeijlemaker, and B. Nag: Importance of Boosting Insurance-driven Cyber Resilience in the Generative AI world
   Venue: *Forbes(I), March, 10*, 2025, Mentioned in **MIT Sloan in the News**.

4. **R. Pal***, Y. Lemiesa, M. Siegel, and B. Nag: How Should Managers use AI for Critical Infrastructure Risk Management?
   Venue: *Forbes(I), February, 21*, 2025, Mentioned in **MIT Sloan in the News**.

5. **R. Pal***, M. Siegel, and B. Nag: How Systemic Cyber Risk Management in Software Supply Chains Works with BOMs
   Venue: *Forbes(I), December, 24*, 2024.

6. **R. Pal***, P. Liu, B. Nag, M. Devnani, and S. Kashyap: Five Challenges to Ensuring Cyber Assurance in the Medical AI Business
Venue: *Forbes(I), November, 7*, 2024.

7. **R. Pal***, M. Siegel, and B. Nag: Three Action Items for Sustainable Cyber Insurance-Linked Securities Markets
Venue: *Forbes(I), August, 27*, 2024, Mentioned in **MIT Sloan in the News**.

8. **R. Pal***, M. Siegel, and B. Nag: Three Things Industrial Control System Enterprises Should Do to Boost Cyber-Resilience.
Venue: *Forbes(I), April, 11*, 2024, Mentioned in **MIT Sloan in the News**.

9. **R. Pal*** and B. Nag: Considering Insurance to Manage IoT-driven Catastrophic Cyber-Risk.
Venue: *Forbes(I), March, 22*, 2024, Mentioned in **MIT Sloan in the News**.

10. **B. Evans-Pritchard*** (quoted **R. Pal**): India Cyber Feels Reinsurance Capacity Pinch
Venue: *(Re)InAsia, March, 10*, 2024

11. **R. Pal***, B. Nag, and M. Siegel: Cyber-security Management Landscape of the Indian Automation Industry: Overview, Challenges, Action Points.
Venue: *Forbes(I), January, 10*, 2024, Mentioned in **MIT Sloan in the News**.

12. **A. Smith*** (quoted **R. Pal**): Customers Consider Dumping Carriers Over Data Concerns.
Venue: *Life Annuity Specialist, Financial Times, December, 4*, 2023

13. **R. Pal***, C. Zhang*, M. Siegel, and B. Nag: Why AI in Cybersecurity Needs to be Part of Business Strategy to Boost Resilience?
Venue: *Forbes(I), October, 6*, 2023, Mentioned in **MIT Sloan in the News**.

14. **R. Pal***, M. Rodriguez, and B. Nag: The Cyber-Insurance Vision is Failing for Ransomware Attacks in India.
Venue: *Forbes(I), September, 12*, 2023, Mentioned in **MIT Sloan in the News**.

15. **R. Pal*** and B. Nag: How Vedic Philosophies Can Help Boost Security in Indian Corporations
Venue: *Forbes(I), June, 12*, 2023, Mentioned in **MIT Sloan in the News**.

16. **R. Pal***, B. Nag, and S. Madnick: How Insurance-Linked Securities Can Improve Cyber-Security in India
Venue: *Forbes(I), May, 8*, 2023, Mentioned in **MIT Sloan in the News**.

17. **R. Pal***, and B. Nag: Five Ways Indian Medical Administrations Can Boost Hospital Cyber-Security.
Venue: *Forbes(I), April, 17*, 2023, Mentioned in **MIT Sloan in the News**.

18. **R. Pal***, and B. Nag: How Should Regulators Policy Cyber-Insurance for Indian Businesses?
Venue: *Forbes(I), February, 6*, 2023, Mentioned in **MIT Sloan in the News**.

19. **R. Pal***, and B. Nag: Vedas and Puranas Can Inspire Enterprises to Improve Cyber-Security Posture: A Cultural View of IT Security Governance in the Wake of AIIMS-like Cyber-Attacks.
Venue: *The Times of India, January, 5*, 2023

20. **R. Pal***, and B. Nag: Cyber-Politics Meets the Statecraft Game.
Venue: *The Times of India, October, 30*, 2022

21. **R. Pal***, B. Nag, and C. Light: Why Cyber-Security Should Be a Strategy in the Infinite Corporate Game.
Venue: *Forbes(I), October, 17*, 2022

22. **R. Pal***, and B. Nag: Cyber-Threat Information Sharing Cooperative: Need of the Hour.
Venue: *Forbes(I), September, 14*, 2022

23. **R. Pal***, and B. Nag: Seven Challenges Against Securing the Systemic Cyber-Space in the Industrial IoT Age.
Venue: *Forbes(I), July, 14*, 2022

24. **R. Pal***, B. Nag, and C-L. Chen: Seven Commandments of Privacy Governance in Information Capitalist Societies.
Venue: *Forbes(I), April, 5*, 2022

25. **R. Pal***, B. Nag*, C. Light, Y. Wang, D. Romero, J. Crowcroft, and K. Psounis: Behavioral Economics: Why Indian Urbanites May Transparently Sell Their Data.
Venue: *Forbes(I), February, 22*, 2022

26. **R. Pal***, B. Nag*, C. Landwehr*, J. Crowcroft, E. Hua, and T. Bandyopadhyay: Will Insurance Improve Cyber-Security Practice for Businesses?
Venue: *Forbes(I), January, 25*, 2022

27. **R. Pal***, J. Crowcroft*, M. Liu*, S. De*, and B. Nag*: In Defense of a Transparent Data Economy for Data Capitalism.
Venue: *Forbes(I), June, 22*, 2021

28. **R. Pal***, B. Nag*, J. Crowcroft*, M. Liu*, P. Ghosh*, and S. De*: Fixing the Data Economy, and Economic Inequality.
Venue: *The Financial Express, October 26,* 2021

29. **R. Pal***, B. Nag*, J. Crowcroft*, M. Liu*, P. Ghosh*, and S. De*:Few Are Averse to Sharing Personal Data.
Venue: *The Financial Express, October 27,* 2021

30. **R. Pal***, B. Nag*, and R. Sequeira*: It's Time for Cyber-Insurance to Become Personal in the WFH Age.
Venue: *Forbes(I), September, 28*, 2021

31. **R. Pal*** and B. Nag*: The Feasibility of Cyber-Risk Management to Ensure Social Good.
Venue: *Forbes(I), April, 30*, 2020

32. **R. Pal*** and B. Nag*: Only Appropriate Data.
Venue: *The Economic Times, November, 14*, 2019

33. **R. Pal*** and B. Nag*: Women Leadership in the Indian Corporate Sector: A Vedic Insight.
Venue: *The Economic Times, December 14, 2021*

34. **R. Pal***, S. Biswas, and B. Nag: Negative Runs Can Better the Commerce and Bat-Ball Fairness of T20s.
Venue: *The Times of India, July 24*, 2021

WEF Publications (World Economic Forum Articles)

1. M. Siegel*, S. Zeijlemaker, R. Yahalom, **R. Pal**, and M. Ross: Three Key Ways to Make Supply Chains More Resilient to Cyber Risks.
Venue: *World Economic Forum, April, 23*, 2025

2. **N. Perucica*** et.al. (contributed by **R. Pal**): Unlocking Cyber-Resilience in Industrial Environments: Five Principles.
Venue: *World Economic Forum, November, 27*, 2023

3. **K. Ukyab*** et.al. (contributed by **R. Pal**): Facilitating Global Interoperability of Cyber Regulations in the Electricity Sector.
Venue: *World Economic Forum, November, 18*, 2023

4. **K. Ukyab*** et.al. (contributed by **R. Pal**): Response to the White House's Request on Harmonizing Cybersecurity Regulations.
Venue: *World Economic Forum, October, 23*, 2023; Recommendations reached the White House.

Journal Publications

1. **R. Pal***, P. Liu, T. Lu, and E. Hua: How Hard is Cyber-Risk Management in IT and OT Systems? A Tale of Conquering the NP-Hardness of Insuring ICSs
Venue: *ACM Transactions on Cyber-Physical Systems*, 2022, Vol. 6(4)

2. **R. Pal***, X. Yin, R. Sequeira, S. Zeijlemaker, and V. Kotala: How Can Enterprises Quantify and Analyze (Multi-Party) Cyber-Risk in their Industrial IoT Network?
Venue: *Accepted for publication in the ACM Transactions on Management Information Systems*, 2023.
[Abstract in SIAM Conference in Financial Engineering 2021]

3. **R. Pal***, B. Nag, S. Madnick, M. Siegel, Y. She: Will Wall Street Solve the Cyber-Security Problem? A Tale of Catastrophe Bond Markets to Improve IT/OT Cyber-Security.
Venue: Under 'Revision' in *ACM Transactions on MIS*, 2023.

4. **R. Pal***, R. Sequeira, Y. Zhu, A. Marotta, M. Siegel, and E. Hua: How Suboptimal is Work-From-Home Security in IT/OT Enterprises? A Strategic Organizational Theory for Managers.
Venue: *Accepted for publication in the ACM Transactions on Management Information Systems*, 2022.

5. **R. Pal***, Z. Huang*, S. Lototsky, X. Yin, J. Crowcroft, M. Liu, S. De, N. Sastry, and B. Nag: Will Catastrophic Cyber-Risk Aggregation Thrive in the IoT Age?: A Cautionary Economics Tale for (Re)Insurers and Likes.
Venue: *ACM Transactions on Management Information Systems*, 2021, Vol. 12(2)

6. **R. Pal***, K. Psounis, J. Crowcroft, P. Hui, J. Kelly, A. Kumar, A. Chatterjee, L. Golubchik, S. Tarkoma, N. Sastry, and B. Nag: When Are Cyber Blackouts in IT-Driven Service Networks Likely?: A Network Oblivious Theory for Cyber (Re)Insurance Feasibility.
Venue: *ACM Transactions on Management Information Systems*, 2020, Vol. 11(4)
Invited talk in **INFORMS Security, 2020, INFORMS Business Analytics 2020**

7. **R. Pal***, Z. Huang*, S. Lototsky, X. Yin, J. Crowcroft, M. Liu, S. De, N. Sastry, and S. Tarkoma: Aggregate Cyber-Risk Management in the IoT Age: Cautionary Statistics for (Re)Insurers and Likes.
Venue: *IEEE Internet of Things Journal*, 2021, Vol. 8(9)

8. **R. Pal***, J. Li*, J. Crowcroft,, M. Liu, Y. Li, and N. Sastry: Privacy Risk is a Function of Information Type: Learnings for the Surveillance Capitalism Age.
Venue: *IEEE Transactions on Network and Service Management*, 2021, Vol. 18(3)

9. C-L. Chen, **R. Pal**, and L. Golubchik: Achieving Transparency Report Privacy in Linear Time.
Venue: *ACM Journal of Data and Information Quality, 2021, Vol. 14(2)*

10. **R. Pal***, J. Crowcroft, Y. Wang, S. De, M. Liu, P. Hui, S. Tarkoma, A. Kumar, Y. Li, and B. Nag: Preference-Based Privacy Markets. [**Media Attention in The Economic Times**]
Venue: *Proceedings of the IEEE Access, 2020, Vol. 8* [**Invited Talk, INFORMS Security Conference, 2020**]

11. **R. Pal***, L. Golubchik, K. Psounis, and P. Hui: Differentiated Security Pricing as an Enabler of Cyber-Insurance - A First Look at a Markets Approach.
***Venue*:** *IEEE Transactions of Dependable and Secure Computing*, 2019, Vol.16(2).

12. **R.Pal***, P. Hui, and V. Prasanna - On Privacy Engineering in the Smart Micro-Grid.
***Venue*:** *IEEE Transactions on Knowledge and Data Engineering*, 2018, Vol.31(5)

13. **R. Pal***, L. Golubchik, and K. Psounis: On Robust Estimates of Correlated Cyber-Insured IT Risk. A First Take of Optimal AI-Based Estimates under 'Small' Data.
***Venue*:** *ACM Transactions on Management Information Systems*, 2019, Vol 10(3).

14. **R.Pal***, L. Golubchik, K. Psounis, and P. Hui: Improving Cyber-Security via Profitable Insurance Markets.
***Venue*:** *ACM SIGMETRICS Performance Evaluation Review*, 2018, Vol.45(4) **[Regular Paper]**

15. **R. Pal***, C. Chelmis*, M. Frincu, and V. Prasanna: Towards Dynamic Demand Response - On Efficient Consumer Grouping Algorithmics.
***Venue*:** *IEEE Transactions on Sustainable Computing*, 2017, Vol 1(1).

16. **R. Pal***, N. Sastry, E. Obiodu, S. Prabhu, and K. Psounis: EdgeMart - A Networked OTT Economy on the Wireless Edge for Saving Multimedia IP Bandwidth.
***Venue*:** *Accepted to Appear in ACM Transactions on Autonomous and Adaptive Systems*, 2023. **[Abstract in INFORMS Annual Meeting 2021]**.

17. A. Ahuja, V. Ribiero, and **R. Pal**: How Should We Regulate Cryptocurrencies by Consensus?: A Strategic Framework for Optimal Legal Transaction Throughput.
Venue: Accepted for Publication in *ACM Journal on Distributd Ledger Technologies*, 2022

18. **R. Pal***, C. Chelmis, M. Frincu, and V. Prasanna: MATCH for the Prosumer Smart Grid: The Algorithmics of Real-Time Power Balance.
***Venue*:** *IEEE Transactions on Parallel and Distributed Systems*, 2016, Vol 27(12).

19. **R. Pal***, S-H. Lin*, A. Ahuja, A. Kumar, L. Golubchik, and A. J. Nachiketas: On the Economic Sustainability of Cloud Sharing Systems: Are Dynamic Single Resource Sharing Markets Stable?
***Venue*:** *ACM SIGMETRICS Performance Evaluation Review*, 2019, Vol 46(4) **[Regular Paper]**.

20. **R. Pal***, S-H. Lin, A. Ahuja*, A. J. Nachikethas, A. Kumar, and L. Golubchik: Are Federated Cloud Sharing Systems Sustainable?: On Dynamic Sharing Markets and Their Stability.

***Venue*: *IEEE Transactions on Sustainable Computing*, Vol. 5(4), 2020**

21. **R. Pal***, X. Yin, and L. Golubchik: Graphical Federated Cloud Sharing Markets
***Venue*: *IEEE Transactions on Sustainable Computing*, Vol. 6(4), 2021**

22. **R. Pal***, and J. Crowcroft: Privacy Trading in the Surveillance Capitalism Age: Viewpoints on 'Privacy-Preserving' Societal Value Creation. [**Media Attention in the *Economic Times*, *Forbes***]
***Venue*: *ACM SIGCOMM Computer Communication Review*, 2019, Vol.49(3)**

23. **R. Pal*** and V. Prasanna: The STREAM Mechanism for CPS Security - The Case of the Smart Grid.
***Venue*: *IEEE Transactions of Computer-Aided Design of Integrated Circuits and Systems*, 2016, Vol.36(4).**

24. S-H. Lin*, **R. Pal***, B. Wang, and L. Golubchik: On a Market-Driven Hybrid P2P Video Streaming Approach.
***Venue*: *IEEE Transactions on Multimedia*, 2016, Vol. 19(5).**

25. **R. Pal*** and P. Hui: Economic Models for Cloud Service Markets: Pricing and Capacity Planning.
***Venue*: *Theoretical Computer Science* (TCS), 2013, Vol 496.**
Among Top 5 accessed TCS papers from 2010-2014

26. **R.Pal***, J. Mitra, and M. N. Pal: Evaluation of Relative Performance of Product Designs: A Fuzzy DEA Approach to Quality Function Deployment.
***Venue*: *Journal of the Operational Research Society* (India), December 2007, Vol 44(4).**
(Presentation in INFORMS Annual Meeting 2001, Undergraduate Research Award)

27. **R. Pal***, S. Kosta, and P. Hui: Settling for Less - A QoS Compromise Mechanism for Mobile Social Networks.
***Venue*: *ACM SIGMETRICS Performance Evaluation Review*, 2011, Vol. 39(3). [Short Paper]**

28. **R.Pal*** and P. Hui: Cyber-Insurance for Cyber-Security: A Topological Take on Modulating Insurance Premiums.
***Venue*: *ACM SIGMETRICS Performance Evaluation Review*, 2012, Vol. 40(3). [Short Paper]**

29. **R. Pal*** and L.Golubchik: On the Economics of Information Security: The Problem of Designing Optimal Cyber-Insurance Contracts.
***Venue* - *ACM SIGMETRICS Performance Evaluation Review*, 2010, Vol. 38(2). [Short Paper]**

Conference Publications (Peer Reviewed)

1. L. Bluestein, **R. Pal***, T. Askerbekov, and M. Siegel: An Operational Theory for Strategic Cyber Defense in IT/OT Networks.
Venue: To Appear in Proceedings of *Winter Simulation Conference* (an INFORMS event), 2025 (IEEE Press), Seattle, USA.

2. **R. Pal*** K. Duan, S. Zeijlemaker, and M. Siegel: A Theory to Quantitatively Estimate and Bound Systemic Cyber Risk.
Venue: To Appear in Proceedings of *Winter Simulation Conference* (an INFORMS event), 2025 (IEEE Press), Seattle, USA.

3. **R. Pal***, B. Nag, S. Zeijlemaker, and M. Siegel: Sustaining Capital-Boosted Cyber Reinsurance Markets using CAT Bonds.

Venue: To Appear in Proceedings of *Winter Simulation Conference* (an INFORMS event), 2025 (IEEE Press), Seattle, USA.

4. Y. Lemiesa*, **R. Pal*** and M. Siegel: AI on Small and Noisy Data is Ineffective for ICS Cyber Risk Management.
Venue: To Appear in Proceedings of *Winter Simulation Conference* (an INFORMS event), 2025 (IEEE Press), Seattle, USA.

5. S. Zeijlemaker*, **R. Pal**, J. Proudfoot, G. Kim, and M. Siegel: Balancing Risk and Reward in Cybersecurity Investment Decisions.
Venue: To Appear in Proceedings of *Americas Conference on Information Systems*, 2025 (AIS Press), Montreal, Canada.

6. S. Zeijlemaker*, **R. Pal**, J. Proudfoot, and M. Siegel: Advancing Cyber-Risk Management by Reducing Strategic Control Gaps.
Venue: To Appear in Proceedings of *Americas Conference on Information Systems*, 2025 (AIS Press), Montreal, Canada.

7. C. Zhang*, **R. Pal***, C. Nicholson, and M. Siegel: (Gen)AI vs (Gen)AI in Industrial Control System Cybersecurity.
Venue: In Proceedings of *Winter Simulation Conference* (an INFORMS event), 2024 (IEEE Press), Florida, USA.

8. **R. Pal*** and R. Sequeira: How Hard is it to Estimate Systemic Enterprise Cyber-Risk?
Venue: In Proceedings of *Winter Simulation Conference* (an INFORMS event), 2024 (IEEE Press), Florida, USA.

9. **R. Pal***, K. Duan, R. Sequeira, and M. Siegel: Is Systemic Cyber Risk Management for Enterprises Sustainable?
Venue: In Proceedings of *Winter Simulation Conference* (an INFORMS event), 2024 (IEEE Press), Florida, USA. [**Nominated for two *Best Paper* awards; TOP 6/400**]

10. **R. Pal***, R. Sequeira, S. Zeijlemaker, and M. Siegel: Optimizing Cyber-Resilience in Critical Infrastructure Networks.
Venue: In Proceedings of *Winter Simulation Conference* (an INFORMS event), 2024 (IEEE Press), Florida, USA.

11. S. Zeijlemaker*, **R. Pal**, and M. Siegel: Strengthening Managerial Foresight to Defeat Cyber Threats.
Venue: In Proceedings of *Americas Conference on Information Systems*, 2024 (AIS Press), Utah, USA.

12. **R. Pal*** and B. Nag: A Mathematical Theory to Price Cyber-CAT Bonds to Boost IT/OT Security.
Venue: In Proceedings of *Winter Simulation Conference* (an INFORMS event), 2023 (IEEE Press), Texas, USA.

13. **R. Pal***, R. Sequeira, S. Zeijlemaker, and M. Siegel: A Network Theory to Quantify and Bound Cyber-Risk in IT/OT Systems.
Venue: In Proceedings of *Winter Simulation Conference* (an INFORMS event), 2023 (IEEE Press), Texas, USA. [**Nominated for a *Best Paper* award; TOP 6/400**]

14. **R. Pal***, R. Sequeira, and M. Siegel: A Mathematical Theory to Quantify Cyber-Resilience

in IT/OT Networks.
Venue: In Proceedings of *Winter Simulation Conference* (an INFORMS event), 2023 (IEEE Press), Texas, USA.

15. **R. Pal***, S. Madnick and M. Siegel: Trading in Catastrophe Bonds Can Boost Security Improving Cyber (Re-)Insurance Markets.
Venue: In Proceedings of *Americas Conference on Information Systems*, 2023 (AIS Press), Panama.

16. **R. Pal***, R. Sequeira*, Y. Zhu*, and Y. She: A Dynamic Theory of Security Free-Riding by Firms in the WFH Age
Venue: In Proceedings of *Winter Simulation Conference* (an INFORMS event), 2022 (IEEE Press), Singapore.

17. B. Nag* and **R. Pal**: Simulation Optimization for Supply Chain Decision Making
Venue: In Proceedings of *Winter Simulation Conference* (an INFORMS event), 2022 (IEEE Press), Singapore.

18. **R. Pal***, T. Lu*, P. Liu*, and X. Yin: Optimal Cyber (Re-)Insurance Policy Writing is NP-Hard in IoT Societies.
Venue: In Proceedings of *Winter Simulation Conference* (an INFORMS event), 2021 (IEEE Press), Phoenix, USA.

19. A. Ahuja, **R. Pal**, V. Ribiero, and L. Golubchik: A Regulatory System for Optimal Legal Transaction Throughput in Cryptocurrency Blockchains.
Venue: Appeared in the *Conference on Information Systems and Technologies (CIST)*, 2021, Los Angeles, USA.

20. **R. Pal***, Y. Wang*, C. Light*, Y. Dong*, P. Ghosh, M. Liu, H. Nagubandi, L. Golubchik, S. De, and B. Nag: Do People Favor Personal Data Markets in a Surveillance Society? [**Media Attention in *Forbes*, *The Financial Express*,**][**Invited Talk, INFORMS Management Science Conference, 2022**]
Venue: In Proceedings of *Winter Simulation Conference*, 2021 (IEEE Press), Phoenix, USA.

21. **R. Pal***, Z. Huang*, X. Yin, S. Lototsky, J. Crowcroft, and M. Liu: Sustainable Catastrophic Cyber-Risk Management in IoT Societies.
Venue: In Proceedings of *Winter Simulation Conference* (an INFORMS event), 2020 (IEEE Press), Orlando, USA.

22. S-H. Lin*, **R. Pal***, M. Paolieri, and L. Golubchik: Performance Driven Resource Sharing Markets for the Small Cloud.
***Venue*:** In Proceedings of *IEEE ICDCS* 2017, Atlanta, USA.

23. **R. Pal***, L. Golubchik, K. Psounis, and P. Hui: Will Cyber-Insurance Improve Network Security? A Market Analysis. [**Media Attention in the *USC News Forbes*, *Wikipedia***]
***Venue*:** In Proceedings of *IEEE INFOCOM*, 2014, Toronto, Canada.

24. **R. Pal*** and L.Golubchik: Analyzing Self-Defense Investments in Internet Security Under Cyber-Insurance Coverage.
***Venue*:** In Proceedings of *IEEE ICDCS* 2010, Genoa, Italy.

25. S-H. Lin, **R. Pal***, B. Wang, and L. Golubchik: Sustaining Ad-Driven P2P Streaming Ecosystems - A Market-Based Approach.

***Venue*:** In Proceedings of *IEEE/ACM IWQoS*, 2015, Portland, USA, with ACM FCRC 2015.

26. **R. Pal***, C. Chelmis*, C. Tadepalli, M. Frincu, S. Aman, and V. Prasanna: On Online Time Series Clustering For Demand Response: A Theory to Break the "Curse of Dimensionality".
***Venue*:** In Proceedings of *ACM E-Energy*, 2015, Bangalore, India.

27. **R. Pal***, L. Golubchik, and K. Psounis: Aegis - A Novel Cyber-Insurance Model.
***Venue*:** In Proceedings of *ACM/GTS GameSec*, 2011, Maryland, USA.

28. **R. Pal*** and P. Hui: Modeling Investments in Internet Security - Tackling Topological Information Uncertainty.
***Venue*:** In Proceedings of ACM/GTS *GameSec*, 2011, Maryland, USA.

29. **R. Pal***, L. Golubchik, K. Psounis, and P. Hui: On A Way to Improve Cyber-Insurer Profits - When A Security Vendor Becomes the Cyber-Insurer.
***Venue*:** In Proceedings of *IFIP Networking*, 2013, New York, USA.

30. C. Leberknight*, **R. Pal***, M. Chiang, and H. V. Poor: The Sharing-Mart System - Online Digital Content Trading, Online Auctions,and Incentives.
***Venue*:** In Proceedings of *GameNets*, 2011, Shanghai, China.

31. **R. Pal*** and C-N.Chuah: Characterizing Link Importance in Multi-Channel, Multi-Radio, Multi-Rate Wireless Mesh Networks.
***Venue*:** In Proceedings of IEEE WCNC, 2008, Las Vegas, USA. **(Research during Masters)**

32. **R. Pal***: On the Reliability of Multi-Hop Dynamic Spectrum Access Networks Supporting QoS-Driven Applications.
***Venue*:** In Proceedings of *IEEE ICC,* 2007, Glasgow, Scotland. **(Solo Masters Research)**

33. **R. Pal***: On Wireless Social Community Network Routers - The Design and Cost-Sharing Problem for Better Deployment.
***Venue*:** In Proceedings of *IEEE GLOBECOM*, 2010, Miami, USA. **(Solo Masters Research)**[A Version appeared in *WWW SIMPLEX* 2012, Lyon, France]

34. **R. Pal***: A Lexicographic Load-Balanced Routing Scheme for Wireless Mesh Networks.
***Venue*:** In Proceedings of *IEEE ICC*, 2008, Beijing, China. **(Solo Masters Research)**

35. **R. Pal*:** Efficient Routing Algorithms for Multi-Channel Dynamic Spectrum Access Networks. ***Venue*:** In Proceedings of *IEEE Dyspan*, 2007, Dublin, Ireland. **(Solo Masters Research)**

36. S. Bandyopadhyay, M. N. Pal, D. Saha, T. Ueda, K. Hasuike, **R. Pal***: Improving System Performance of Ad Hoc Wireless Network with Directional Antenna.
***Venue*:** In Proceedings of *IEEE ICC*, 2003, Anchorage, USA. **(Undergraduate Research)**

Book Chapters

1. **R. Pal***: Cyber-Insurance Market
Venue: *Encyclopedia of Cryptography, Security, and Privacy*, **Springer Nature**, Eds. S. Jajodia, M. Yung, and P. Samarati. To Appear in 2025

2. B. Nag*, M. Devnani, and **R. Pal***: Navigating the Ethereal: Ethical Frameworks in AI for Healthcare.

Venue: *Advances in Artificial Intelligence for Healthcare Applications*, **CRC Press (Taylor and Francis)**, Eds. V. Anoop, S. Verma, and H. Pillai. To Appear in 2025

3. **R. Pal*** J. Mitra, and M. N. Pal: A Fuzzy-DEA Approach on Quality Function Deployment for Evaluation of Relative Efficiency of Product Designs.
Venue: *Theory and Applications of Productivity and Efficiency: Econometric and DEA Approach*, **Macmillan Publishers**, Eds. R. Ghosh and C. Neogi. 2005

Research Pitches (To Companies)

1. Y. Lemiesa*, **R. Pal***, and M. Siegel: How Should Managers Use AI for Critical Infrastructure Risk Management
Venue: *MIT CAMS Annual AI Event, May, 21*, 2025

2. C. Zhang*, **R. Pal***, and M. Siegel: (Gen)AI vs (Gen)AI in Industrial Control System Cybersecurity
Venue: *MIT CAMS Annual CCIS Event, May, 15*, 2024

3. **R. Pal*** and M. Siegel: Quantifying and Optimizing ICS Cyber Resilience
Venue: *MIT CAMS Annual CCIS Event, May, 15*, 2024

4. S. Zeijlemaker*, G. Kim*, **R. Pal**, J. Proudfoot, M. Ishikawa, and M. Siegel: Identifying Strategic Control Gaps in Managing Cyber Risk Through Simulation Gaming
Venue: *MIT CAMS Annual CCIS Event, May, 15*, 2024

5. **R. Pal***, S. Madnick, and M. Siegel: Will Wall Street Solve the Cyber-Security Problem?
Venue: *MIT CAMS Annual CCIS Event, May, 11*, 2023

6. **R. Pal***, S. Zeijlemaker, and M. Siegel: APT Induced IT/OT Cyber-Risk Quantification
Venue: *MIT CAMS Annual CCIS Event, May, 11*, 2023

7. **R. Pal***, S. Zeijlemaker, and M. Siegel: A New FAIR Method to Boost Resilience in IT/OT Enterprise Infrastructures
Venue: *MIT CAMS Annual CCIS Event, May, 11*, 2023

8. **R. Pal***, C. Zhang, C. Nicholson, and M. Siegel: AI in Cyber-Security as a Business Strategy
Venue: *MIT CAMS Annual CCIS Event, May, 11*, 2023

9. **S. Zeijelmaker***, R. Pal, and M. Siegel: Perusing Watermelon Risks to Strengthen Cyber-Resilience
Venue: *MIT CAMS Annual CCIS Event, May, 11*, 2023

Funded Projects

1. **Liberty Mutual Insurance**: Strategic Agent-Based Cyber-Defense Mechanisms for Critical Infrastructure Graphs to Boost Resilience. *Funding Amount:* USD 350K (Ongoing), **Co-PI@MIT**

2. **German Cybersecurity Agency**: Graph-based Information Aggregation to Improve the Cyber-security Management in Critical Infrastructures. *Funding Amount:* USD 150K (Completed), **Co-PI@MIT** - received funding via *Asvin*, Germany

3. **US DOE (DE-EE0008003)**: Data Driven Modeling and Analytics for Enhanced System Layer Implementation. *Funding Amount:* USD 100,000,000 (Completed)

4. **NSF (CNS - 1637372)**: Safer Connected Communities Through Integrated Data Driven Modeling. Learning, and Optimization. *Funding Amount:* USD 199,984 (Completed)

5. **US DOE (DE-OE0000192)**: LADWP Smart Grid Regional Demonstration Project. *Funding Amount:* USD 120,560,000 (Completed)

6. **NSF (ACI 1339756)**: The XScala Project: A Community Repository for Model Driven Design and Tuning of Data-Intensive Applications for Extreme-Scale Accelerator-Based Systems. *Funding Amount:* USD 748,914 (Completed)

7. **NSF (CNS - 1616575)**: Network-Level Security Posture Assessment and Predictive Analytics: From Theory to Practice. *Funding Amount:* USD 499,982 (Completed)

8. **NSF (CNS - 1939006)**: Theory and Practice of Risk-Informed Cyber-Insurance Policies: Risk Dependency, Risk Aggregation, and Active Threat Landscape. *Funding Amount:* USD 199,997 (Completed)

9. **ARO (W911NF1810208)**: Multiscale Network Games of Competition and Collusion. *Funding Amount:* USD 100,000,000 (Completed)

Writings (Astrology)

1. **R. Pal**: Will Rahu Give Spiritual Ethos? An Argumentative Analysis in *Jyotish*.
***Venue:** Motilal Banarsidass International Publishers, February 2025.* (**Book**)

2. **R. Pal*** and R. Shukla: How to Demystify the Feared Saturn Saade Saati in Vedic Astrology.
***Venue:** Medium, October 21, 2024.* (**Original Research Article**)

3. **R. Pal*** and R. Shukla: A Simple Approach to Demystify Timing of Events in Vedic Astrology.
***Venue:** Medium, July 21, 2024.* (**Original Research Article**)

4. **R. Pal*** and R. Shukla: A Simple Approach to Judge a Horoscope in Vedic Astrology.
***Venue:** Medium, July 5, 2024.*

5. **R. Pal*** and R. Shukla: Do You Have the Behavioral Aptitude for Vedic Astrology? A Guru Questions a Disciple from MIT.
***Venue:** Medium, May 14, 2024.*

6. **R. Pal*** and R. Shukla: Do You Have the Predictive Aptitude for Vedic Astrology? A Guru Questions a Disciple from MIT.
***Venue:** Medium, May 14, 2024.*

7. **R. Pal*** and R. Shukla: A Simplified Approach to Demystify the Navamsa (D9) Chart.
***Venue:** Medium, November 09, 2023.*

8. **R. Pal*** and R. Shukla: A Systematic Methodology to Analyse Career Strength in Vedic Astrology.
***Venue:** Medium, September 22, 2023.*

9. **R. Pal*** and R. Shukla: The 'Marriage' of Artificial Intelligence with the Vedic Astrology Business.
***Venue:** Medium, September 10, 2023.*

Research Student Testimonials

1. *"Dr. Ranjan Pal has been an exceptional mentor. He combines technical guidance with the freedom to explore, offering detailed feedback that has sharpened my skills as both a researcher and a communicator. Despite his busy schedule, he consistently remains accessible to his students and offers steady support for both our academic growth and personal well-being."* **(Cynthia Zhang, EECS, MIT)**

2. *"Working with Ranjan has been a truly enriching experience. He has consistently provided clear guidance and thoughtful feedback, helping me grow as a researcher. His mentorship style strikes a perfect balance between offering strong support and giving students the freedom to take initiative, which has helped strengthen my confidence and ability to work independently. My time at CAMS with Ranjan has taught me to approach research with a more critical, analytical mindset, preparing me for my future academic and professional goals."* **(Lillian Bluestein, EECS, MIT)**

3. *"Dr. Pal has served as a great mentor leading me through understanding how to approach my research with a business and scientific perspective. Working alongside him has given me a valuable understanding of how to communicate my ideas and also has helped support me when I was confused on how to answer a research question. Serving as a guide for my research, we worked on a paper together and I have been able to present my work at MIT CAMS many times, which I attribute the multiple successes of to him."* **(Yaphet Lemiesa, EECS, MIT)**

4. *"Dr. Ranjan Pal served as my MEng thesis advisor, where his guidance was critical across all stages of the project. His suggested background material was invaluable in scoping and planning my thesis research, and he consistently provided useful and actionable feedback across both technical results and exposition. Throughout the process, his perspective helped me contextualize the real-world applications of my research and identify the most useful future directions."* **(Darren Yao, EECS, MIT)**

5. *"I began working with Dr. Ranjan Pal at the University of Michigan, where his mentorship was instrumental in shaping my understanding of cyber risk management and academic research. He provided clear, structured guidance on formulating research questions, conducting experiments, and engaging with the broader research community. Even after transitioning to MIT CAMS, he remained an accessible and supportive mentor, continuing to collaborate and offer thoughtful insights. His mentorship directly contributed to my successful admission to the PhD program at USC and my ongoing development as a researcher."* **(Rohan Sequeira, ECE, University of Southern California)**

6. *"Ranjan's research has a compelling blend of mathematical theory and empirics/case studies - often describes as 'applied theory', that he applies to a host of very timely and impact business management problems in the field of cybersecurity. Such a research approach immediately caught my attention as a math major at the University of Michigan, where I started collaborating with Ranjan. This collaboration extended to when I went to Harvard and Columbia for my graduate studies. From the start, Ranjan's mentorship played a pivotal role in my holistic development as a researcher. His thoughtful guidance was instrumental in shaping the direction and success of our work. But more than that, Ranjan became a trusted advisor and a close friend, where conversations extended far beyond research. As a student researcher navigating uncertainty and doubt, I found immense comfort and clarity in our conversations. Ranjan would share his own experiences with honesty and warmth, offering not just encouragement but genuinely practical advice. Looking back, I can say with confidence that Ranjan has been one of the most influential people in my journey. His mentorship continues to shape the way I think, work, and grow — not just as a researcher, but as a person. I'm deeply grateful to call him both a mentor and a lifelong friend."* **(Peihan Liu, Computer Science, Columbia University)**