Nithin Nagaraj

CONTACT INFORMATION	#203-A, 2nd Floor Divya MSR Gateway Apts. Near Mathikere Flyover Gokula, Bengaluru 560054	*Phone:* +91-9663861742 (Mob.), +91-080-22185126 (Off.) *E-mail:* nithin.nagaraj@gmail.com, nithin.nagaraj@ieee.org, nithin@nias.res.in, nithin@alum.rpi.edu *URL:* https://sites.google.com/site/nithinnagaraj2/

PERSONAL INFO. Age: 46 years (Date of Birth: 16 Nov. 1977). Nationality: INDIA.

RESEARCH INTERESTS Brain-inspired Artificial Intelligence, Neurochaos Learning, Causality, Complexity Theories of Conscioussness, Information theory, Chaos/Non-linear dynamics and its applications, Indic approaches to mathematics and computation.

CURRENT AFFILIATION

Professor and Head, NIAS Complex Systems Programme. Member of Conscioussness Studies Programme & NIAS Math Heritage Initiative, School of Humanities, National Institute of Advanced Studies (NIAS), Indian Institute of Science Campus, Bengaluru. **Oct'24–Current**

Visiting Professor, Amrita School of Engineering, Department of Electronics and Communications Engineering, Amrita Vishwa Vidyapeetham, Amritapuri campus. **Jun'23–Current**

PREVIOUS AFFILIATION

Associate Professor, Consciousness Studies Programme, School of Humanities, National Institute of Advanced Studies (NIAS), Indian Institute of Science Campus, Bengaluru. **Oct'18–Oct'24**

Assistant Professor, Consciousness Studies Programme, School of Humanities, National Institute of Advanced Studies (NIAS), Indian Institute of Science Campus, Bengaluru. **Oct'15–Oct'18**

EDUCATION

Ph. D. (January 2010)
National Institute of Advanced Studies (NIAS), IISc Campus, Bangalore, INDIA **Jan'05–July'08**
Thesis – **"Novel applications of Chaos Theory to Coding and Cryptography".**
Thesis Advisor: Prof. Prabhakar G. Vaidya (Email: pgvaidya@nias.iisc.ernet.in).

Master of Science (Electrical Engineering, 2001)
Rensselaer Polytechnic Institute, Troy, NY, USA **Aug'99–May'01**
Thesis – **"Motion-SPECK: A Set Partitioned Embedded Moving Color Picture Coder".**
Thesis Advisor: Prof. William A. Pearlman (Email: pearlman@ecse.rpi.edu).

Bachelor of Engineering (Electrical and Electronics Engineering, 1999)
National Institute of Technology, Karnataka (NITK), INDIA **July'95–July'99**
Undergraduate Project: **"Spectral Analysis on the TI– TMS320C50 Digital Signal Processor".**
Project Guide: Dr. A. R. Beig.

PAST ACADEMIC POSITIONS HELD

Assistant Professor, Dept. of Electronics and Communications, Amrita School of Engineering, Amrita Vishwa Vidyapeetham, Amritapuri Campus, Clappana P.O., Kollam, Kerala - 690525. **Dec'08–Aug'13**

Adjunct Faculty, School of Natural Sciences and Engg., National Institute of Advanced Studies, Indian Institute of Science Campus, Bangalore. **Aug'12–Aug'13**

(Visiting) Post-doctoral Fellow, City University of Hong Kong, HK **June'11-August'11**

Visiting Faculty (Mathematics), IISER, Pune **August'08 – Nov'08**

Visiting Scholar, Institute of Mathematical Sciences, Chennai **May'08 – July'08**

	Research Assistant, Center for Image Processing Research lab, RPI, NY, USA	**Sep'99 – May'00**
	Teaching Assistant, Department of ECSE, RPI, NY, USA	**Sep'99 – May'01**

INDUSTRY
RESEARCH
EXPERIENCE

Lead Scientist, Biomedical Signal Analysis Lab, Diagnostics Imaging & Biomedical Technologies, GE Global Research, Bengaluru **Sep'13–Sep'15**

Research Scientist, Imaging Technologies lab, GE Global Research, Bengaluru **July'01 – Dec'04**

Summer Intern, David Sarnoff Research Center, Princeton, NJ, USA **May'00 – Aug'00**

RESEARCH
ACHIEVEMENTS

Published in international journals such as Chaos, Solitons & Fractals (impact factor = 9.922), Neural Networks (9.657), Journal of Biomed. Info. (6.317), Frontiers in Neurology (4.003), Phys. Rev. E (2.7) CHAOS-AIP (3.436), CNSNS-Elsevier (4.186), IEEE Trans. on Cir. & Sys. for Video Tech. (5.859), European Phys. Journal-Spec. Top. (2.891), PeerJ (3.061), IEEE Access, PeerJ:Computer Science (1.392), Intl. Journal Bif. & Chaos, Pramana, Heliyon, Annals of Indian Academy of Neurology and others with **total Google Scholar citations exceeding** 1600 and **h-index=18**. Published in **NeurIPS** (# 1 international conference in Artificial Intelligence). Paper/poster presentations in 75+ national and international conferences, 150+ invited talks at various forums. Co-inventor of **8 U.S. patent applications (2 patents granted)** and **2 India patent applications**.

COURSES
TAUGHT

@ **NIAS:** Introduction to Mathematical Methods, Topics in Artificial Intelligence: Reading the Classics, Scientific Theories of Consciousness (STC-I): Mathematical Methods, STC-II: Measures of Consciousness, Topics in Information Theory, Learning and Casual Inference, Topics in Information, Coding Theory and Chaos with applications to Consciousness Studies, Causality Testing and Its Applications, Qualitative Research Methods (Philosophy of Science module), Panpsychism: Philosophical and Scientific Perspectives, Topics in Information theory, Chaos and Causal Learning.
@ **NIMHANS:** Computational Neuroscience, Mathematical Foundations of Neuroscience & Consciousness Studies Research.
@ **Amrita University:** Signals and Systems, Digital Signal Processing, Wavelet-based Signal Processing and Applications, Probability Theory and Linear Algebra, Cryptography, Information Theory and Coding Techniques. Consistently scored $> 95\%$ in teaching evaluations (both Bachelors and Masters level).
@ **IISER-Pune:** An Introduction to Cryptography.

PHD
STUDENTS

- Anand Ganesh, NIAS (Aug. 2020 - ongoing)
- Hema Karnam (Aug. 2021 - ongoing)
- Remya Ajai AS, Amrita Vishwa Vidyapeetham (June 2017 - June 2024)
- Rahul Venugopal, NIMHANS (June 2018 - Dec. 2023)
- Harikrishnan NB, Trans-Disciplinary University (Dec. 2018 - Oct. 2022)
- Aditi Kathpalia, NIAS (Aug. 2016 - Feb. 2021)
- Karthi Balasubramanium, Amrita Vishwa Vidyapeetham (June 2016)

BOOK

- **Self, Culture and Consciousness: Interdisciplinary Convergences on Knowing and Being**, Edited Volume (Editors: Sangeetha Menon, Nithin Nagaraj, V V Binoy), Springer Nature, March 2018.

EDITORIAL

- Snehanshu Saha and Nithin Nagaraj, **Measure or infer? Role of modeling and machine learning in modern astronomy**. Eur. Phys. J. Spec. Top. 230, 2173 – 2175 (2021).

BOOK CHAPTERS	1. **Nithin Nagaraj**, "Testing for Causality in Artificial Intelligence (AI)." In: Menon, S., Todariya, S., Agerwala, T. (eds) AI, Consciousness and The New Humanism. Springer, Singapore. March 2024.
	2. **Nithin Nagaraj**, "Measuring Consciousness in the Clinic", in *Biomedical and Clinical Engineering for Healthcare Advancement*. (Editor: N Sriraam) IGI Global, October 2019. pp. 66–77.
	3. **Nithin Nagaraj**, Mohit Virmani, "Is 'Information' Fundamental for a Scientific Theory of Consciousness? ", in *Self, Culture and Consciousness: Interdisciplinary Convergences on Knowing and Being*, (Editors: Sangeetha Menon, Nithin Nagaraj, and VV Binoy) Springer Nature, 31 March, 2018.
	4. Sangeetha Menon, **Nithin Nagaraj**, V V Binoy, "Bridging Self, Culture and Consciousness", in *Self, Culture and Consciousness: Interdisciplinary Convergences on Knowing and Being*, (Editors: Sangeetha Menon, Nithin Nagaraj, and VV Binoy) Springer Nature, 31 March, 2018.
	5. **Nithin Nagaraj**, Karthi Balasubramanian, "Measuring complexity of chaotic systems with cybernetics applications", in *Handbook of Research on Applied Cybernetics and Systems Science* (Editors: Snehanshu Saha, Abhyuday Mandal, Anand MN, SL Sangam, Sarasvathi Ram), IGI Global April 2017, pp. 301−334.

JOURNAL PUBLICATIONS	• Hema Karnam Surendrababu, **Nithin Nagaraj**, *A Novel Backdoor Detection Approach Using Entropy-Based Measures*, IEEE Access, vol. 12, pp. 114057-114072, August 2024.
	• Remya Ajai AS, Harikrishnan NB, **Nithin Nagaraj**, *Analysis of logistic map based neurons in neurochaos learning architectures for data classification*, Chaos, Solitons & Fractals Volume 170, 113347, May 2023.
	• Deeksha Sethi, **Nithin Nagaraj**, Harikrishnan NB, *Neurochaos feature transformation for Machine Learning*, Integration (Elsevier), online (Jan. 25), Volume 90, Pages 157-162, May 2023.
	• Aditi Kathpalia, **Nithin Nagaraj**, *Granger causality for compressively sensed sparse signals*, Phys. Rev. E. 107(3), 034308, March 2023.
	• Naga Venkata Trinath Sai Munagala, Prem Kumar Amanchi, Karthi Balasubramanian, Athira Panicker and **Nithin Nagaraj**, *Compression-Complexity Measures for Analysis and Classification of Coronaviruses*, Entropy (MDPI) 25, no. 1: 81, 2023.
	• **Nithin Nagaraj**, *The Unreasonable Effectiveness of the Chaotic Tent Map in Engineering Applications*, Chaos Theory and Applications, Dissemination and Research in the Study of Complex Systems and Their Applications (EDIESCA 2022), Vol. 4, Issue 4, pp. 197-204, 2022.
	• Seethal CR, Yamuna B, Karthi Balasubramanian, Deepak Mishra, **Nithin Nagaraj**, *Turbo Product Codes for Satellite Communication: a Survey*, International Journal on Communications Antenna and Propagation (IRECAP), Vol. 12, No. 2, pp. 98-110, ISSN 2039 5086, April 2022.
	• Harikrishnan NB, Pranay SY, **Nithin Nagaraj**, *Classifcation of SARSCoV2 viral genome sequences using Neurochaos Learning*, Medical Biological Engineering Computing, published online, 7 June 2022.
	• Bhargava Ganti, Ganne Chaitanya , Ridhanya Sree Balamurugan, **Nithin Nagaraj**, Karthi Balasubramanian, Sandipan Pati, *Time-Series Generative Adversarial Network Approach of Deep Learning Improves Seizure Detection From the Human Thalamic SEEG*, Frontiers in Neurology, vol. 13, Feb. 2022.
	• Harikrishnan NB, **Nithin Nagaraj**, *When noise meets chaos: Stochastic resonance in Neurochaos Learning*, Neural Networks, Volume 143, November 2021, Pages 425-435. ISSN 0893-6080. Available online 29 June 2021.
	• Pranay SY, **Nithin Nagaraj**, *Causal Discovery using Compression-Complexity Measures*, Journal of Biomedical Informatics, Volume 117, May 2021, 103724.
	• Aditi Kathpalia, **Nithin Nagaraj**, *Time-Reversibility, Causality and Compression-Complexity*, Entropy 2021, 23(3), 327.
	• Aditi Kathpalia, **Nithin Nagaraj**, *Measuring Causality: The Science of Cause and Effect*, Resonance-Journal of Science Education, Volume 26, Issue 2, Feb. 2021, pp. 191-210.
	• Snehanshu Saha, **Nithin Nagaraj**, Archana Mathur, Rahul Yedida, Sneha H R, *Evolution of novel activation functions in neural network training for astronomy data: habitability classification of exoplanets*, Eur. Phys. J. Spec. Top. 229, 2629-2738, Nov. 2020.
	• Aahan Singh, **Nithin Nagaraj**, Srinidhi Hiriyannaiah, Lalit Mohan Patnaik, *ISCG: An Intelligent Sensing and Caption Generation System for Object Detection and Captioning Using Deep Learning*, International Journal of Intelligent Information Technologies (IJIIT) 16(4), pp. 51–67, Web. 24 Sep. 2020.

- Karthi Balasubramanian, **Nithin Nagaraj**, Sandipan Pati, *Chaos or Randomness? Effect of Vagus Nerve Stimulation During Sleep on Heart-Rate Variability*, IETE Journal of Research (Taylor & Francis), June 2020.

- Harikrishnan Nellippallil Balakrishnan, Aditi Kathpalia, Snehanshu Saha, **Nithin Nagaraj**, *ChaosNet: A chaos based artificial neural network architecture for classification*, Chaos: An Interdisciplinary Journal of Non-linear Science, Vol. 29, No. 11, pp. 113125-1 – 113125-17, Oct. 2019.

- Aditi Kathpalia, **Nithin Nagaraj**, *Causal Stability and Synchronization*, Chaos: An Interdisciplinary Journal of Nonlinear Science (Fast-track), Vol. 29, pp. 091103, Sep. 2019.

- Aditi Kathpalia, **Nithin Nagaraj**, *Data-based intervention approach for Complexity-Causality measure*, PeerJ Computer Science 5:e196, May 2019.

- Mohit Virmani, **Nithin Nagaraj**, *A Novel Perturbation Based Compression Complexity Measure for Networks*, Heliyon 5 - e01181. Feb. 2019.

- **Nithin Nagaraj**, *Using Cantor Sets For Error Detection*, PeerJ Computer Science 5:e171, Jan. 2019.

- **Nithin Nagaraj**, Karthi Balasubramanian, *Three Perspectives on Complexity: Entropy, Compression, Subsymmetry*, European Physics Journal Special Topics (Special issue: Challenges in the analysis of complex systems), 2017, 226: 3251.

- Karthi Balasubramanian, Harikumar K, **Nithin Nagaraj**, Sandipan Pati, *Vagus Nerve Stimulation Modulates Complexity of Heart Rate Variability Differently during Sleep and Wakefulness*, Annals of Indian Academy of Neurology, vol. 20, issue 4, pp. $403 - 407$, 2017.

- **Nithin Nagaraj**, Karthi Balasubramanian, *Dynamical Complexity Of Short and Noisy Time Series: Compression -Complexity vs. Shannon Entropy*, European Physics Journal Special Topics (Special issue: Aspects of Statistical Mechanics and Dynamical Complexity), Volume 226, Issue 10, pp. 2191-2204, July 2017.

- Karthi Balasubramanian, **Nithin Nagaraj**, *Aging and cardiovascular complexity: Effect of length of RR tachograms*, PeerJ 4:e2755, Dec. 6 2016, https://doi.org/10.7717/peerj.2755.

- Karthi Balasubramanian, Silpa S Nair, **Nithin Nagaraj**, *Classification of periodic, chaotic and random sequences using approximate entropy and Lempel-Ziv complexity measures*, Pramana - Journal of Physics, Indian Academy of Sciences, Vol. 84, Issue 3, pp. 365–372, Feb. 2015.

- **Nithin Nagaraj**, Karthi Balasubramanian, Sutirth Dey, *A New Complexity Measure For Time Series Analysis and Classification*, European Physics Journal - Special Topics, 222, pp. $847 - 860$, 2013.

- **Nithin Nagaraj**, *One-Time Pad as a Nonlinear Dynamical System*, Communications in Nonlinear Science and Numerical Simulation, Vol. 17, No. 11, pp. $4029 - 4036$, Nov. 2012.

- **Nithin Nagaraj**, *Huffman Coding as a Nonlinear Dynamical System*, International Journal of Bifurcation and Chaos, Vol. 21, No. 6, pp. $1727 - 1736$, 2011.

- Sahasranand K. R., **Nithin Nagaraj**, Rajan S, *How not to share a set of secrets*, International Journal of Computer Science and Information Security, Vol. 8, No. 1, pp. $234 - 237$, Apr. 2010.

- Prabhakar G. Vaidya, Sajini Anand P. S., **Nithin Nagaraj**, *A Nonlinear Generalization of Singular Value Decomposition and Its Application to Mathematical Modeling and Chaotic Cryptanalysis*, Acta Applicandae Mathematicae, Vol. 112, No. 2, pp. $205 - 221$ (Published Online on 23 Jan. 2010).

- **Nithin Nagaraj**, Prabhakar G. Vaidya, *Multiplexing of Discrete Chaotic Signals in Presence of Noise*, Chaos: An Interdisciplinary Journal of Nonlinear Science, Vol. 19, pp. 033102, Jul. 2009.

- **Nithin Nagaraj**, *A Dynamical Systems Proof of Kraft-McMillan Inequality and Its Converse for Prefix-free Codes*, Chaos: An Interdisciplinary Journal of Non-linear Science, Vol. 19, pp. 013136, Mar. 2009. (This published paper was also selected for online publication by Virtual Journal of Quantum Information, Vol. 9, No. 4, Apr. 2009).

- **Nithin Nagaraj**, Prabhakar G. Vaidya, Kishor G. Bhat, *Arithmetic Coding as a Non-linear Dynamical System*, Communications in Non-linear Science and Numerical Simulation, Vol. 14, No. 4, pp. $1013 - 1020$, Apr. 2009.

- **Nithin Nagaraj**, Mahesh C. Shastry, Prabhakar G. Vaidya, *Increasing Average Period Lengths by Switching of Robust Chaos Maps in Finite Precision*, European Physics Journal Special Topics, Vol. 165, pp. $73 - 83$, 2008.

- **Nithin Nagaraj**, Vivek Vaidya, and Prabhakar G. Vaidya, *Re-visiting the One-Time Pad*, International Journal of Network Security, Vol. 6, No. 1, pp. $94 - 102$, Jan. 2008.

- William A. Pearlman, Asad Islam, **Nithin Nagaraj**, and Amir Said, Efficient, *Low-Complexity Image*

Coding with a Set-Partitioning Embedded Block Coder, IEEE Trans. Circuits and Systems for Video Technology, Vol. 14, pp. $1219 - 1235$, Nov. 2004.

CITATIONS **1600+** (h-index = 18). Source: Google Scholar.

PATENTS
(GRANTED)

1. **Nithin Nagaraj**, Srikanth Suryanarayanan, *Graph extraction labelling and visualization*, US PAT# 7,719,533, issued on 18 May 2010.

2. Srikanth Suryanarayanan, Rakesh Mullick, Yogisha Mallya, Vidya P Kamath, **Nithin Nagaraj**, *Method and apparatus for segmenting structure in CT angiography*, US PAT# 7,676,257, issued on 9 March 2010.

PATENT
APPLICATIONS

1. Co-inventor, **A Chaos-Causality Driven Pruning Method for Neural Networks to Improve Efficiency Without Loss of Performance**, Indian patent appln., Oct. 2024.

2. Co-inventor, **Method of Storing and Retrieving Input Data in an Electronic Device and the Electronic Device Thereof**, Indian patent appln., 2014.

3. Co-inventor, **Method and System for Multi-Parametric Ultrasound for Liver Characterization**, US patent appln., Nov. 2015.

4. Co-inventor, **System and methods for propagation correction in ultrasound imaging**, US patent appln., Dec. 2014.

5. Co-inventor, **Image Registration System and Method**, US patent appln., Oct. 2006.
Nov. 2003. 20050113679, Docket Number 140312-1

6. Lead-inventor, **Data Embedding Method and System**, US patent appln., Jan. 2003.

7. Lead-inventor, **Method and apparatus for performing Non-dyadic Wavelet Transforms**, US patent appln., Jan. 2003.

8. Co-inventor, **Position Coding System and Method**, US patent appln., Nov. 2002.
(The above $\#3 - 8$ were filed during my stint at GE Global Research Center, Bengaluru. #2 is owned by Samsung R & D Institute India - Bangalore Pvt. Ltd.)

GRANTS

- Principal Investigator (and Mentor), *Investigation into the Chaotic dynamics of Neural Networks* Mentoring Dr. Archana Mathur, Assistant Professor, Dept. of Information Science Engg., Nitte Meenakshi Institute of Technology (NMIT), Bengaluru. SERB-TARE scheme (Teachers Associateship For Research Excellence), Govt. of India. Amount = 18.30 Lakhs. Period: 2022 – 2025.

- Co-Principal Investigator, *NIAS-IKS Project on Mathematics, Computation and Information Science*, IKS (AICTE, MoE, Govt. of India) IKS: Indian Knowledge Systems. Amount = 14.05 Lakhs. Period: 2021–2023.

- Principal Investigator, *Causality testing in Cognitive neuroscience with applications to measures of consciousness*, Cognitive Science Research Initiative, Dept. of Sci. & Tech., Govt. of India. Amount: INR 20.94 Lakhs. Period: July 2018 – June 2022.

- Principal Investigator, *A study of consciousness measures and synchrony between brain cardiovascular dynamics in yoga experience* , Science And Technology for Yoga And Meditation (SATYAM), Dept. of Sci. & Tech., Govt. of India. Period: INR 33.08 Lakhs. Duration: August 2018 – June 2022.

- Co-Investigator, *Casual structures, Vimarsa and the Pratyabhijna: A Comparative Research Study on Kashmir Saivism and Information Theory*, Tata Trusts, PI: Prof. Sangeetha Menon. Amount: INR 1,66,26,585/- Period: 2018 – 2023.

- Co-Principal Investigator, *Early Fusion Music: Cross-Cultural Musical Exchanges in Colonial India from the Late 18th to the Early 20th Century*, Indian Heritage in Digital Space (IHDS), of Interdisciplinary Cyber Physical Systems (ICPS) Programme of the Dept. of Science & Tech. (DST), Govt. of India. Amount= 40.84 Lakhs. Period: 2019–2024.

- DST Young Scientist Grant for 3 years (offered in 2013 with a total amount of INR 21 Lakhs, declined owing to personal reasons).

- Rapid Grant for Young Investigators (RGYI), Dept. of Biotechnology (DBT), Ministry of Science and Tech., Govt. of India (2010–2013) Amount: INR 26 Lakhs (approx.).

- Department of Science & Technology, Govt. of India **foreign travel grant** (2007).

- Council of Scientific and Industrial Research, Govt. of India **foreign travel grant** (2007).

HONORS / AWARDS / FELLOWSHIPS

- **Distinguished Alumnus** for outstanding service and contribution towards Research and Education, NITK Surathkal Alumni Association, September 22, 2024.

- IEEE Senior Member, October 2019. Only 10% of more than $400,000$ IEEE members have achieved this level.

- Certificate of Appreciation for contribution to research at Amrita University for four consecutive years (2009 - 2013).

- NIAS PhD fellowship sponsored by Department of Science & Technology (DST), Govt. of India, Jan. 2005 - July 2008.

- Invited by Department of Mathematics, University of Sains Malaysia (USM) to deliver a short course "**Chaos and Cryptography**" jointly with Prof. Prabhakar G. Vaidya, April 13-15, 2011.

- **Team Excellence award**, GE Global Research (2002).

- **Bronze patent medal**, GE Global Research (2002).

- **Six Sigma Green Belt certification**, GE Global Research (2001).

- **Graduate Assistantship**, Department of ECSE, Rensselaer Polytechnic Institute (1999–2001).

- NITK (formerly KREC, Surathkal) **Merit Scholarship** for academic excellence for all years of undergraduate study (1995 - 1999).

PROFESSIONAL ACTIVITIES & MISC.

- Guest-Editor for the special issue **Data Compression and Complexity** in *Entropy* (an open access journal of MDPI), 2020-21.

- Guest-Editor EPJ ST Special Issue: **Modeling, Machine Learning and Astronomy**, 2020-21.

- Joint Editor (along with Snehanshu Saha and Shikha Tripathi), Revised Selected Papers, **MMLA: Modeling, Machine Learning and Astronomy, First International Conference, MMLA 2019**, Bangalore, India, November 22–23, 2019 (Communications in Computer and Information Science, Springer).

- Invited member, Advisory Committee, 5th IEEE International conference at GSSS Institute of Engineering and Technology for Women, Mysuru, Dec. 2021.

- Invited reviewer for the following international journals: Nature Scientific reports, Journal of Consciousness Studies, Journal of Theoretical Biology (JTB), Chaos (Amer. Inst. of Physics), European Physics Journal (EPJ), Comm. in Non. Sci. Nonlinear Sim. (Elsevier), IEEE Transactions on Image Processing, Acta Applicandae Mathematicae, Intl. Journal of Imaging (IJI), EURASIP Journal of Information Security, Journal of Information Sciences (Elsevier), International Journal of Bifurcations and Chaos (IJBC), IEEE Transactions on Information Forensics & Security, Computers and Mathematics with Applications (Elsevier), The Journal of Franklin Institute, Mathematical Problems in Engineering (MPE), Intl. Journal of Biomedical & Clinical Engg. (IJBCE), Non-linear Dynamics (Springer), Springer Plus, Journal of Psycholinguistic Research, MDPI (Entropy), Physica A and

Frontiers in Psychology, Knowledge and Information Systems (Springer-Nature), Pattern Recognition Letters.

- 150+ invited talks at various national/international forums.
- Invited member, Advisory Council of METI: Messaging Extra Terrestrial Intelligence International, San Francisco, CA, USA, in the capacity as an expert in complexity, information science and signal processing (May 2018 current).
- Invited member, IEEE Computer Society Executive Committee Member, Bangalore Chapter (July 2017 – December 2019).
- Technical Programme Chair & Committee of Integrity, Intl. Conf. on Modeling Machine Learning and Astronomy (MMLA 2019), PES University, Bengaluru.
- Invited to chair a session at IEEE SPCOM 2016 international conference (June 2016).
- Invited to chair a session at CNSD 2016 international conference (Dec. 2016).
- Invited judge for Poster Session IEEE Drone Computing International Conference, October 2017.
- Invited reviewer for Mathematics module for The Connected Learning Initiatives (Clix), an initiative of Tata Institute of Social Sciences, Mumbai, MIT Massachusetts and Tata Trusts.

ERDÖS NUMBER

3

(Erdös → K. Ramachandra → Prabhakar G. Vaidya → Nithin Nagaraj).

REPORTS

Co-authored 46 arXiv reports (please visit arXiv.org for the full list), qualified to endorse for the following categories: cs.CR, cs.IT, cs.LG, math.IT, physics.data-an, q-bio.NC. Co-authored 2 bioRxiv reports, 1 PeerJ pre-print and 2 NIAS reports.

CONFERENCE PROCEEDINGS, PRESENTATIONS, POSTERS

1. **Nithin Nagaraj**, *The Locus of Perception*, Special session on "The Philosophy of Perception", MBCC 2023: Mind, Brain, Consciousness Conference, organized by Indian Knowledge System and Mental Health Applications (IKSMHA) Centre, IIT Mandi, Dec. 14, 2023.

2. **Nithin Nagaraj**, *Donald Hoffmans Conscious Realism and Sri Ramanujas Viidvaita*, MBCC 2023: Mind, Brain, Consciousness Conference, organized by Indian Knowledge System and Mental Health Applications (IKSMHA) Centre, IIT Mandi, Dec. 14, 2023.

3. Rahul Venugopal, Arun Sasidharan, Ramajayam G, Ravindra P.N, **Nithin Nagaraj**, Kaviraja Udupa, John P John and Bindu M Kutty, *Targeting ongoing neural oscillations and aperiodic activity through tACS: Unravelling frequency specific modulation and nonlinear interactions*, MBCC 2023: Mind, Brain, Consciousness Conference, organized by Indian Knowledge System and Mental Health Applications (IKSMHA) Centre, IIT Mandi, Dec. 14, 2023.

4. Poornima Mohan, Karthi Balasubramanian, Gayathri R Prabhu, **Nithin Nagaraj**, *Interpretation of ETC in the context of Biomedical Signal Analysis*, IEEE R10 Humanitarian Technology Conference 2023 (AI and Smart Technologies for Humanity), 16-18 Oct. 2023, Marwadi University, Rajkot India.

5. Aditi Kathpalia, **Nithin Nagaraj**, *Spectral estimation based on compressibility*, Perspectives in Nonlinear Dynamics 2023 (PNLD 2023), Centre for Complex Systems & Dynamics, IIT Madras and the Department of Applied Mechanics, IIT Madras, Aug. 1, 2023.

6. Aditi Kathpalia, Harikrishnan NB, **Nithin Nagaraj**, *A hybrid Neurochaos Learning-Reservoir Computing architecture for prediction*, Dynamic Days US 2023, Jan. 9, 2023.

7. Harikrishnan NB, Diptendu Chatterjee,**Nithin Nagaraj**, *Revisiting the XOR problem using Neurochaos Learning*, Conference on Nonlinear Systems and Dynamics 2022, IISER Pune, 16 December 2022.

8. Harikrishnan N B and Aditi Kathpalia and **Nithin Nagaraj**, *Causality Preserving Chaotic Transformation and Classification using Neurochaos Learning*, Proceedings of Advances in Neural Information Processing Systems, NeurIPS 2022 (Eds.: Alice H. Oh and Alekh Agarwal and Danielle Belgrave and Kyunghyun Cho), 2022.

9. Anwesh Bhattacharya, Snehanshu Saha, **Nithin Nagaraj**, *Fairly Constricted Multi-Objective Particle Swarm Optimization*, The 29th International Conference on Neural Information Processing (ICONIP 2022), IIT Indore, Nov. 24, 2022.

10. **Nithin Nagaraj**, Aditi Kathpalia, *Strengths of Effort-To-Compress Complexity for analyzing time series from complex systems*, Conference on Complex Systems (CCS 2022), Palma de Mallorca, Spain, October 17, 2022.

11. **Nithin Nagaraj**, *The Unreasonable Effectiveness of the Chaotic Tent Map in Engineering Applications*, Meeting for the Dissemination and Research in the Study of Complex Systems and their Applications (EDIESCA 2022), University of Baja California, Campus Ensenada B.C., virtual mode, Sep. 30, 2022.

12. Remya Ajai AS, Harikrishnan NB, **Nithin Nagaraj**, *Analysis of Logistic Map Based Neurons in Neuorchaos Learning Architectures for Data Classification*, Meeting for the Dissemination and Research in the Study of Complex Systems and their Applications (EDIESCA 2022), University of Baja California, Campus Ensenada B.C., virtual mode, Sep. 30, 2022.

13. Deeksha Sethi, **Nithin Nagaraj**, Harikrishnan NB, *Neurochaos Feature Transformation for Machine Learning*, Meeting for the Dissemination and Research in the Study of Complex Systems and their Applications (EDIESCA 2022), University of Baja California, Campus Ensenada B.C., virtual mode, Sep. 30, 2022.

14. Aditi Kathpalia, **Nithin Nagaraj**, *Multivariate Granger Causal Discovery for Compressively Sensed Signals*, NETDAT22 - International Seminar & Workshop on Inverse Network Dynamics - Network structure and function from nonlinear dynamics and time series data, Max Planck Institute for the Physics of Complex Systems, Dresden, Germany, 14th September 2022.

15. Aditi Kathpalia, **Nithin Nagaraj**, *Causal Properties of Synchronizing Systems*, Dynamics Days Europe 2022, Univ. of Aberdeen, 25th August 2022.

16. Hemang Subramanian, Patricia Angle, and **Nithin Nagaraj**, *Do Sentiment Indices Outperform Quantitative Indicators As Predictors For Cryptocurrency Prices?*, The annual Pacific Asia Conference on Information Systems (PACIS), PACIS 2022 Proceedings. 293.

17. Aditi Kathpalia, **Nithin Nagaraj**, *Measuring Consciousness using Network Connectivity Approaches*, 8th Annual Conference of Cognitive Science (ACCS8), Amrita Vishwa Vidyapeetham, Amritapuri, (online), Jan. 21, 2022.

18. Harikrishnan NB, **Nithin Nagaraj**, *Why does Neurochaos Learning work? The Role of Chaos and Noise in Neurochaos Learning*, Conference on Nonlinear Systems & Dynamics (CNSD-2021), Sastra University (online), Dec. 22, 2021.

19. Anand Ganesh, **Nithin Nagaraj**, *Dynamical Analysis of Recursive Neural Networks*, Conference on Nonlinear Systems & Dynamics (CNSD-2021), Sastra University (online), Dec. 18, 2021.

20. Aditi Kathpalia, **Nithin Nagaraj**, *Causal Criteria for Synchronization*, Conference on Nonlinear Systems & Dynamics (CNSD-2021), Sastra University (online), Dec. 17, 2021.

21. **Nithin Nagaraj**, *Infotheoretic Analysis of Short Time Series of Coupled Chaotic Maps: Issues & Challenges*, Conference on Nonlinear Systems Dynamics (CNSD-2021), Sastra University (online), Dec. 20, 2021.

22. **Nithin Nagaraj**, *Problems with first-order infotheoretic measures on short sequences*, in Proceedings of the 1st International Electronic Conference on Information, 115 December 2021, MDPI: Basel, Switzerland, doi:10.3390/IECI2021-12073.

23. Aditi Kathpalia,**Nithin Nagaraj**, *Information-theoretic Underpinnings of the Effort-to-Compress Complexity Measure*, in Proceedings of the 1st International Electronic Conference on Information, 115 December 2021, MDPI: Basel, Switzerland, doi:10.3390/IECI2021-11957.

24. Abhishek Nandekar, Preeth Khona, Rajani MB, Anindya Sinha, **Nithin Nagaraj**, *Causal Analysis of Carnatic Music Compositions*, 2021 IEEE International Conference on Electronics, Computing and Communication Technologies (CONECCT), July 10, 2021.

25. Anindya Sinha, Debapriyo Chakraborty, **Nithin Nagaraj**, *Social Networks, Communication Behaviour and Disease Ecology in Seabirds - A Proposal for Adélie Penguins in Antarctica*, In: Proceedings of the Workshop on Social Network of Animals in Extreme Environment of Antarctica with Special Reference to Penguins, Zoological Survey of India and Ministry of Earth Sciences, Government of India, New Delhi, pp. 2629, Sep. 2021.

26. **Nithin Nagaraj**, *The Exclusion Axiom of Integrated Information Theory of Consciousness*, The 24th meeting of the Association for the Scientific Study of Consciousness (ASSC24), Tel-Aviv, Concurrent Talks (online), June 16. 2021.

27. Harikrishnan NB, **Nithin Nagaraj**, *Neurochaos Inspired Hybrid Machine Learning Architecture for Classification*, 2020 International Conference on Signal Processing and Communications (SPCOM), Bangalore, India, July 2020.

28. Harikrishnan NB, **Nithin Nagaraj**, *A Novel Chaos Theory Inspired Neuronal Architecture*, IEEE conference on Global Conference for Advancement in Technology (IEEE GCAT), Bengaluru, Oct. 18 2019.

29. Nikita Agarwal, Aditi Kathpalia, **Nithin Nagaraj**, *Distinguishing Different Levels of Consciousness using a Novel Network Causal Activity Measure*, IEEE conference on Global Conference for Advancement in Technology (IEEE GCAT), Bengaluru, Oct. 18 2019.

30. Aditi Kathpalia, **Nithin Nagaraj**, *A Novel Compression Based Neuronal Architecture for Memory Encoding*, Computing and Networking for Smart Healthcare (CoNSH) Workshop in International Conference on Distributed Computing and Networking (ICDCN 19), January 4, 2019, Bangalore,India.

31. Srilakshmi P, Karthi Balasubramanian, **Nithin Nagaraj**, Sandipan Pati, *Multiscale Analysis of Heart Rate Variability Using Subsymmetry and Effort-to-Compress Complexity Measures*, INDICON-2018, Amrita Vishwa Vidyapeetham, Coimbatore, Dec. 17, 2018.

32. Aditi Kathpalia, **Nithin Nagaraj**, *Detecting Anticipating and Complete Synchronization using Causality Testing Methods* , Conference on Nonlinear Systems and Dynamics (CNSD-2018), School of Computational and Integrative Sciences, Jawaharlal Nehru University, New Delhi, Oct. 12, 2018.

33. Aditi Kathpalia, **Nithin Nagaraj**, *Deciphering Anticipation Synchronization using Causality Testing Methods*, International Conference on Causality in the Neuro- and Psychological Sciences, Univ. of Antwerp, Belgium, Sep. 20, 2018.

34. Abhijith MA, Aishwarya N, Aswathi G, Krishnapriya M, Aditi Kathpalia, **Nithin Nagaraj**, *Structured Compressed Sensing Matrices for Causality Detection*, 3rd IEEE Intl. Conf. on Recent Trends in Elec., Info. & Comm. Tech. (RTEICT 2018), May 18 - 19 , 2018, Bengaluru.

35. Aditi Kathpalia, **Nithin Nagaraj**, *Measuring Causality using Compression-Complexity*, Brain Modes 2017, National Brain Research Center, Gurugram, Dec. 11-14, 2017.

36. Aditi Kathpalia, **Nithin Nagaraj**, *A New Approach to Causality Based on Compression-Complexity*, The Science of Consciousness (TSC 2017), La Jolla, California, June 5-10, 2017.

37. Mohit Virmani, **Nithin Nagaraj**, *Towards Measuring Consciousness By A Compression-Complexity Approach*, The Science of Consciousness (TSC 2017), La Jolla, California, 2017.

38. Suresh Jois, **Nithin Nagaraj**, *A Study of Two Measures of Integrated Information in Brain Networks*, The Science of Consciousness (TSC 2017), La Jolla, California, June 5-10, 2017.

39. Aditi Kathpalia, **Nithin Nagaraj**, *On the Limitations of Causality Measures in Neuroscience*, BSSE Annual Research Symposium 2017: Computational Bioengineering, 27 - 28 January 2017, IISc. Bengaluru.

40. **Nithin Nagaraj**, K. R. Sahasranand, *Separating a Heterogeneous Mixture of Chaotic Signals using Compressed Sensing*, Conf. on Nonlinear Sys. & Dynamics (CNSD 2016), IISER Kolkata, Dec. 16 - 18, 2016.

41. **Nithin Nagaraj**, K. R. Sahasranand, *Neural Signal Multiplexing via Compressed Sensing*, IEEE Intl. Conf. on Signal Processing & Communications (IEEE SPCOM 2016), IISc., Bengaluru, 12 - 15 June, 2016. 10.1109/SPCOM.2016.7746641

42. Mohit Virmani, **Nithin Nagaraj**, *Integrated Information Theory − a candidate for nonreductive theory of Consciousness*, Young Researchers Conference in Cognitive Science, University of Hyderabad, 27-29 March 2016.

43. **Nithin Nagaraj**, *Entropy and the Neuron: Insights from Information Theory*, Intl. Conf. on Consciousness, Cognition and Culture: Implications for the 21st Century, National Institute of Advanced Studies, Indian Institute of Science Campus, Bengaluru, Dec 9 - 11, 2015.

44. Karthi Balasubramanian, **Nithin Nagaraj**, *Automatic Identification of Devanagari Script Texts using Complexity based Measures*, oral presentation at Conf. on Nonlinear Sys. and Dynamics (CNSD), IISER Mohali, March 13-15 2015.

45. **Nithin Nagaraj**, KW Wong, KN Sriram, *Master-Slave Coupled Chaotic Synchronization based Robust Source Coding*, poster presented at International Conference on Perspectives in Non-Linear Dynamics (PNLD 2013), Univ. of Hyderabad, July 15-18, 2013.

46. Karthi Balasubramanian, **Nithin Nagaraj**, *Comparative Analysis of Lempel-Ziv and ETC Complexity Measures*, International Conference on Perspectives in Non-Linear Dynamics (PNLD 2013), Univ. of Hyderabad, July 15-18, 2013.

47. **Nithin Nagaraj**, *When Information Meets Chaos: Applications of Symbolic Dynamics*, invited talk at Mini-Symposia on Time Series Analysis and Fractals, National Conference on Nonlinear Systems and Dynamics (NCNSD 2012), IISER Pune, 14 July, 2012.

48. Karthi Balasubramanian, Gayathri R Prabhu, Lakshmipriya VK, Maneesha Krishnan, Praveena R, **Nithin Nagaraj**, *Classification of Periodic, Chaotic and Random Sequences using NSRPS Complexity Measure*, National Conference on Nonlinear Systems and Dynamics (NCNSD 2012), 12 - 15 July, 2012.

49. Remya Ajai A.S.,**Nithin Nagaraj**, *A Novel Methodology for Memory Reduction in Distributed Arithmetic Based Discrete Wavelet Transform*, Procedia Engineering Vol. 30 (2012) $226 − −233$. This paper was presented at Intl. Conf. on Comm. Tech. and System Design (ICCSTD 2011), Amrita Vishwa Vidyapeetham, Ettimadai Campus, Coimbatore, December 7-9, 2011.

50. **Nithin Nagaraj**, Mathew Shaji Kavalekalam, Arjun Venugopal T., Nithin Krishnan, *Lossless Compression and Complexity of Chaotic Sequences*, National Conference on Nonlinear Systems and Dynamics (NCNSD-2011), Bharathidasan University, Tiruchirapalli, Tamil Nadu, January 27-30, 2011.

51. **Nithin Nagaraj**, *Exchange Chaotic Synchronization and its Applications to Secure Cryptographic Key Exchange on an Insecure Channel*, International Conference on Perspectives in Non-Linear Dynamics (PNLD), IISc., Bangalore, July 26-29, 2010.

52. **Nithin Nagaraj**, Prabhakar G. Vaidya, *Multiplexing of Discrete Chaotic Signals in the Presence of Noise*, National Conference on Non-linear Systems and Dynamics, Saha Institute of Nuclear Physics, Kolkata, March 5, 2009.

53. **Nithin Nagaraj**, Prabhakar G. Vaidya, *Perfect Secrecy Systems, Lossless Compression and Logic Gates: An unifying theme using Nonlinear Dynamical Systems*, International Conference on Nonlinear Dynamical Systems and Turbulence, IISc., Bangalore, July 17-22 2008.

54. Sajini Anand P.S., **Nithin Nagaraj**, Prabhakar G. Vaidya, *Imprecise Synchronization: A Study*, International Conference on Nonlinear Dynamical Systems and Turbulence, IISc., Bangalore, July 17-22, 2008.

55. **Nithin Nagaraj**, Prabhakar G. Vaidya, *Joint Source Coding, Channel Coding, and Encryption using Nonlinear Dynamical Systems Approach*, Proceedings (Narosa Publishers, New Delhi [2009]) of the Intl. Conf. on Recent Developments in Nonlinear Dynamics, held at the Bharathidasan University, Tiruchirapalli, India during 7-9 , February 2008.

56. **Nithin Nagaraj**, Prabhakar G. Vaidya, *A Non-linear Dynamical Systems Approach to Source Coding*, National Conference on Nonlinear Systems and Dynamics, Jan 3-5, 2008.

57. **Nithin Nagaraj**, Prabhakar G. Vaidya, Rajesh Sundaresan, *A Dynamical Systems Approach to Source Compression for Constrained Sources*, Non-linear Dynamics and Chaos: Advances and Perspectives, 17-21 September 2007, Aberdeen, UK.

58. **Nithin Nagaraj**, Mahesh C. Shastry, Prabhakar G. Vaidya, *Switching of non-linear dynamical systems and its effect on round-off induced periodicity with applications to pseudo-random number generation*, Non-linear Dynamics and Chaos: Advances and Perspectives, 17-21 September 2007, Aberdeen, UK.

59. Nikhil Balaji, **Nithin Nagaraj**, *Cryptanalysis of a Chaotic Encryption Algorithm*, National Conference on Nonlinear Systems and Dynamics, Jan 3-5, 2008.

60. Pavan Tallapragada, **Nithin Nagaraj**, Prabhakar G. Vaidya, *Coding and Decoding Programs using Chaotic Dynamical Systems*, Natl. Conf. on Nonlinear Systems and Dynamics, Jan 3-5, 2008.

61. **Nithin Nagaraj**, Mahesh C. Shastry, Prabhakar G. Vaidya, *Stochastic switching of deterministic chaotic systems on a finite precision computer: Implications to chaos and randomness*, International Conference on Stochastic Applications, IISc., Bangalore, July 2007.

62. Prabhakar G. Vaidya, Sajini Anand P.S., **Nithin Nagaraj**, *A Non-linear Generalization of Singular Value Decomposition and its Application to Cryptanalysis*, International Instructional workshop / conference on Applied Multi-variate data Analysis with Applications to Life, Social and Environmental Science, Hyderabad, Jan 16-20, 2008.

63. Prabhakar G. Vaidya, **Nithin Nagaraj**, *Foundational issues of Chaos and Randomness: God or Devil, Do We Have a Choice?*, In: Proceedings of Foundations of Sciences. Project of History of Indian Science, Philosophy and Culture (PHISPC), editor BV Sreekantan, New Delhi, pp. $1 - 17$, 2006.

64. **Nithin Nagaraj**, Prabhakar G. Vaidya, Kishor G. Bhat, *Joint Arithmetic Coding and Encryption using Chaotic Maps*, National Conference on Mathematical Foundations of Coding, Complexity, Computation and Cryptography, IISc., Bangalore, July 20-22, 2006.

65. Mahesh C. Shastry, **Nithin Nagaraj**, Prabhakar G. Vaidya, *A Generalization of the Logistic Map and its Applications in Generating Pseudo-Random Numbers*, International Conf. on Mathematical Modelling and Computer Simulation, LNMIIT, Jaipur, December 12-15, 2006.

66. **Nithin Nagaraj**, Shekhar Dwivedi, *CxCxC: Compressed Connected Components Labeling Algorithm*, Proceedings Proceedings of SPIE Medical Imaging 2007: Image Processing, vol. 6512, pp. 65123M, March 2007.

67. Prabhakar G. Vaidya, **Nithin Nagaraj**, Sajini Anand, *Topological Derivatives and other Embeddings for Ocean Floor Tsunami Data*, poster presented at International Conference on Tsunami & Non-linear Waves, Saha Institute of Nuclear Physics, Salt Lake, Calcutta, India, March 6-10, 2006.

68. **Nithin Nagaraj**, Yogisha Mallya, *On the Use of Lossless Integer Wavelet Transforms in Medical Image Segmentation*, Proceedings of SPIE Medical Imaging 2005: Image Processing, vol. 5747, pp. $1913 - 1924$, April 2005.

69. Girish Gopalakrishnan, Tim Poston, **Nithin Nagaraj**, Rakesh Mullick, Jerome Knoplioch, *Implicit Function-based Phantoms for Evaluation of Registration Algorithms*, Proceedings of SPIE Medical Imaging 2005: Image Processing, vol. 5747, pp. $1310 - 1316$, April 2005.

70. Srikanth Suryanarayanan, Rakesh Mullick, Yogish Mallya, Vidya Kamath, **Nithin Nagaraj**, *Automatic Partitioning of Head CTA for Enabling Segmentation*, Proceedings of SPIE Medical Imaging 2004: Image Processing, vol. 5370, pp. $410 - 419$, May 2004.

71. **Nithin Nagaraj**, William A. Pearlman, Asad Islam, *Block Based Embedded Color Image and Video Coding*, Proceedings of SPIE Visual Communications and Image Processing: Multimedia Technologies for Embedded Systems, vol. 5308, pp. $264 - 275$, January 2004.

72. **Nithin Nagaraj**, Sudipta Mukhopadhyay, Frederick Wheeler, Ricardo. S. Avila, *Region of Inter-est and Windowing Based Progressive Image Transmission Using JPEG2000*, Proceedings of SPIE Medical Imaging 2003: PACS and Integrated Medical Information Systems, vol. 5747, pp. $382 - 391$, May 2003.

73. **Nithin Nagaraj**, *A Very Low-Complexity Multi-resolution Prediction-based Wavelet Transform Method for Medical Image Compression*, proceedings of the IEEE: TENCON Conference on Convergent Technologies for Asia-Pacific Region, vol. 2, pp. $525 - 528$, October 2003.

74. **Nithin Nagaraj**, Rakesh Mullick, *Zero-Distortion Lossless Data Embedding*, Proceedings of SPIE Medical Imaging 2004: Image Processing, vol. 5370, pp. $1906 - 1913$, April 2004.

75. S. V. Bharath Kumar, **Nithin Nagaraj**, Sudipta Mukhopadhyay, Xiaofeng Xu, *Block-based Conditional Entropy Coding for Medical Image Compression*, Proceedings of SPIE Medical Imaging 2003: Image Processing, vol. 5033, pp. $375 - 381$, May 2003.

76. Sudipta Mukhopadhyay, **Nithin Nagaraj**, Xiaofeng Xu, Frederick W. Wheeler, Saad Sirohey, Robert Sigal, *TruRez: A FastWavelet-based Multi-resolution Image Compression Scheme for Medical Images*, infoRAD presentation, Radiological Society of North America (RSNA) 2002, Illinois, USA.

INVITED
TALKS

1. **The AI Revolution: the Good, the Bad & the Ugly**, Accelerator Thought Leader @ 3rd Edition of ABB Accelerator, ABB Innovation Center, Bengaluru, September 26, 2024.

2. **ABC: AI-Brain-Consciousness, the Incompatible Trinity of the 21st Century**, Zoho R&D Labs, Zoho Corporation, Kottarakara, Kerala, September 12, 2024.

3. **The AI Revolution: From Turing to ChatGPT and Beyond**, Departments of Physics & Mathematics at Amrita School of Physical Sciences, Amrita Vishwa Vidyapeetham, Amritapuri Campus, September 4, 2024.

4. **Borders of Consciousness**, Departments of Physics & Mathematics at Amrita School of Physical Sciences, Amrita Vishwa Vidyapeetham, Amritapuri Campus, September 4, 2024.

5. **Artificial Intelligence in Healthcare Applications**, invited lecture, "Deeksharambh" (orientation programme for 1st semester students of Dept. of ECE), Faculty of Engineering and Technology JAIN (Deemed to be University), Bengaluru, August 14, 2024.

6. **The Complex Brain: Network Causal Activity, Levels of Consciousness & Meditation**, invited lecture, 1st workshop on Neuroscience of Consciousness (*NeuroCon1*), Center for Neuroscience, IISc., Bengaluru, June 16, 2024.

7. **Principal Component Analysis and its Applications**, invited expert lecture for EEE642: Machine Learning course, Dept. of Electrical & Electronics Engineering, MSRIT Bengaluru, May 24, 2024.

8. **Introduction to Support Vector Machines & Support Vector Regression**, invited expert lecture for EEE642: Machine Learning course , Dept. of Electrical & Electronics Engineering, MSRIT Bengaluru, May 20, 2024.

9. **AI & Indian Economy**, keynote address at the Young Economist Competition, Dept. of Economics, Christ University, March 26, 2024.

10. **Research Methodology for Computer Scientists**, Refresher course in Computer Science/Computer Application, UGC Malaviya Mission Teacher Training Centre, University of Calicut, online, March 19, 2024.

11. **An Introduction to Artificial Intelligence**, Refresher course in Computer Science/Computer Application, UGC Malaviya Mission Teacher Training Centre, University of Calicut, online, March 14, 2024.

12. **Research Methodology: How to do innovative research effectively?**, 16th Faculty Induction Programme, Malaviya Mission Teacher Training Centre, University of Calicut, Kerala, Online, March 8, 2024.

13. **The AI Revolution**, Sri Saraswathi Vidya Nikethan (for class-X students), Dommasandra, Bengaluru, Feb. 10, 2024.

14. **The AI Revolution: From Turing to ChatGPT and Beyond**, as a part of the Refresher Course in Computational Sciences (Physics, Chemistry, Electronics, Computer Science & Maths), UGC-Malaviya Mission Teacher Training Centre, Goa University, Online, January 19, 2024.

15. **Prime Numbers, Secret Sharing and Visual Cryptography**, harate@Ganitha Mela 2023: A week-long Mathematics Fair for school students and general public, Vishwa Vidyapeeth, Takshashila Campus, Yelahanka, Bengaluru, 18 22 December 2023.

16. **Brain-Inspired Computing, Communication and Machine Learning**, tutorial session, CoCoNet'23: Fifth International Conference on Computing and Network Communications, PES University, Bengaluru, Dec. 19. 2023.

17. **Research Methodology**, 14th Faculty Induction Programme (Guru Dakshta) , UGC-HRDC University of Calicut, Online, Oct. 4, 2023.

18. **How to do innovative research effectively?**, Amrita School of Engineering, in collaboration with Institution's Innovation Council (IIC), Amrita Vishwa Vidyapeetham, Amritapuri Campus, Sep. 20, 2023.

19. **Machine Learning: Trends & Opportunities**, Dept. of Electronics & Communications Engg., Amrita School of Engineering, Amrita Vishwa Vidyapeetham, Amritapuri Campus, Sep. 18, 2023.

20. **Significance of Mathematics**, Guest of Honor at the inauguration of Madhava Ganitha Kalakshetra, Vishwa Vidyapeeth (in collaboration with Seed2Sapling), Magadha Campus, Varthur, Bengaluru, September 9, 2023.

21. **Chaos Theory, Fractals & Machine Learning**, ACM Student Chapter & Department of Computer Science & Engineering, Ramaiah Institute of Technology, Bengaluru, August 18, 2023.

22. **Research Methodology**, 13th Faculty Induction Programme, UGC-HRDC University of Calicut, Online, July 22, 2023.

23. **Some Tips on Research, Webinar**, Dept. of Elec. & Comm. Engg., TKM College of Engineering (online), July 12, 2023.

24. **Brain-Inspired Machine Learning and its Applications**, Five-Day Faculty Development Program on Machine and Deep Learning Research Opportunities in Electrical Science Industries, organized by Dept. of Electrical & Electronics Engg., MSRIT (in association with MathWorks), Bengaluru, 16th March, 2023.

25. **Research Methodology**, Programme for research scholars & post-doctoral fellows (Science stream), UGC-HRDC University of Calicut, Online, 7th March 2023.

26. **From Turing to Sophia to ChatGPT: Has AI finally arrived?**, 6th Edition Mahindra AFS Technology Symposium, Mahindra Technical Academy, (virtual mode) 18th February 2023.

27. **Are Indian Knowledge Systems still relevant in today's world?**, National Seminar on Sanskrit-IKS & ICT organized by Samskriti Foundation, Mysore, National Institute of Advanced Studies, 18th February 2023. (joint work with Prof. Shailaja D Sharma)

28. **Research Methodology**, Faculty Induction Programme, UGC-HRDC University of Calicut, Online, 14th February 2023.

29. **Mathematical Foundations of PCA & ICA and applications to Data Science**, as a part of Five Day Online Faculty Development Programme on *Importance of Data Science in Machine Learning and its Applications* organized by RV Institute of Technology & Management, (online), 8th February 2023.

30. **Is "Science of Consciousness" in a Crisis? Can Indian Knowledge Systems help?**, Workshop on Consciousness and Indian Knowledge System, IKSMHA Center, IIT Mandi (online), 14th December 2022.

31. **Facets of AI: From Turing to Sophia & Beyond**, NIAS-DST Training Programme on "Science & Technology: Global Developments and Perspectives", NIAS, IISc. Campus, Bengaluru, November 28, 2022.

32. **Can Chaos & Noise help Machine Learning?**, International (Online) Workshop on Reservoir Computing & Neural Networks, Complex Systems and Dynamics, IIT Madras, November 24, 2022.

33. **The Wonderful World of Chaos & Fractals**, University Colloquium, Azim Premji University, November 4, 2022.

34. **Research Methodology**, as a part of the refresher course for Computer Science, UGC-HRDC, University of Calicut, October 24, 2022.

35. **Chaos, Noise & Machine Learning**, Physics Seminar Series, Dept. of Physics, IIT Tirupati (online), 19th August 2022.

36. **An Introduction to Artificial Intelligence: Principles of Machine Learning**, Trends and Issues, IEEE CASS Expert Talk Series, Dept. of Elec & Comm. Engg., TKM College of Engineering, Kollam, July 18, 2022.

37. **Mathematical Foundations of Support Vector Machines**, Department of Electrical & Electronics Engg., MSRIT, Bengaluru, July 7, 2022.

38. **Science of Consciousness**, Dept. of Physics, Amrita University, Amritapuri Campus, Kollam, Kerala, May 27, 2022.

39. **Basics of Machine Learning and Neurochaos Learning**, (along with Harikrishnan NB) Dept. of Electronics & Comm. Engg., Amrita University, Amritapuri Campus, Kollam, Kerala, May 26, 2022.

40. **Science of Consciousness**, Student-Scientist interaction, organized by Science Communication Programme, National Institute of Advanced Studies, Bengaluru, May 9, 2022.

41. **Basics of Machine Learning**, Department of Electrical & Electronics Engg., MSRIT, Bengaluru, April 27, 2022.

42. Invited discussant on paper presented by Varun Wighmal (PhD scholar, JNU) on **Dialogue on Consciousness: Marking the Contours of a Problem**, organized by Foundation for Creative Social Research and Knowledge and Practice Group, April 27, 2022. (link forthcoming)

43. **Mathematical Foundations of PCA & ICA (with applications to EEG analysis)**, Faculty Development Program on Signal and Image Processing Innovations in computational Neuroscience, MSRIT, March 8, 2022, Bengaluru.

44. **A Tale of Causality: Challenges, Methods & Applications**, ARTPARK, IISc., Online, Feb. 23, 2022.

45. **NeuroBytes**, virtual fireside chat session, (along with Dr. Veeky Baths, BITS Pilani Goa Campus) as a part of 8th Annual Conference of Cognitive Science (ACCS8), Amrita Vishwa Vidyapeetham, Amritapuri (online), Jan. 22, 2022.

46. **What is Consciousness?**, (along with Anand Ganesh), Nightingales Elders Enrichment Centre, Malleswaram, Bengaluru, December 13, 2021.

47. **The Fascinating World of Chaos & Fractals**, Foundation Program lecture, online, IIT Jammu, December 4, 2021.

48. **"ABC" - AI, Brain & Consciousness: The Incompatible Trinity of the 21st Century**, Concepts of Consciousness Neuroscience & Indian Philosophical Perspective, Center for Consciousness Studies, NIMHANS, International Webinar, September 30, 2021.

49. **NL: Neurochaos Learning - Neuroscience Meets Machine Learning**, Zoho Corp (Online) September 6, 2021.

50. **Neurochaos Learning: When Neuroscience Meets Machine Learning**, distinguished lecture, 2021 IEEE SPS Summer School on Deep Learning for Sensor Signal Analytics, CSIR-CSIO, Chandigarh (Online), August 3, 2021.

51. **'Siribhoovalaya', Magic Squares and Beyond**, NIAS-SERB Online Workshop on Algorithms in the Indic Tradition, June 11, 2021.

52. **Neurochaos Learning**, spotlight session of the General Machine Learning & Natural Language Processing Day, OCUPAI'21, Philips Innovation Campus, Bengaluru (online), June 2, 2021.

53. **Research Methodology in Computer Science**, invited session, Dept. of Computer Science, University of Calicut, Webinar, May 25, 2021.

54. **From Good Reading to Great Writing**, as a part of Module 7: Reading & Writing - Multidisciplinary Reflections of *Research Writing and Communication Course* - a free online 2-credit course via Zoom, NIAS Consciousness Studies Programme, April 27, 2021.

55. **Brain-inspired Machine Learning**, International I-Brain Erasmus+ round table, CCCP-2020 Online Symposium, Moscow, December 12, 2020.

56. **Consciousness, Self and AI: The Present and The Future**, Unconventional Learning module, 35th Tata Group eMerging Leadership Seminar (TGeLS), Tata Management Training Center, online, October 22, 2020.

57. **Minds and Machines: The Future of AI and Consciousness**, (along with Prof. Sangeetha Menon), TCS eLS session on Unconventional Learning , Tata Management Training Center (TMTC), online, September 30, 2020.

58. **Artificial Intelligence and Machine Consciousness**, Reading Glass Thematic Discussion (along with Harikrishnan NB), Consciousness Studies Programme, NIAS, Bengaluru (online), August 26, 2020.

59. **AI: From Turing to Sophia**, as a part of the online International Workshop *Facets of AI*, NIAS, Bengaluru (online), July 15, 2020.

60. **Neuro-Chaos Inspired Machine Learning**, ISE-Webinar Series on Industry and Research Perspective on Data Science, organized by NMIT (in collaboration with IEEE Computer Society Bengaluru Chapter), June 13, 2020.

61. **"Learning" from the Coronaviruses: Genome Classification and Complexity**, NIAS Wednesday Discussion meeting (online - along with co-speakers Pranay S Yadav and Harikrishnan NB), NIAS, Bengaluru, June 3, 2020.

62. **Novel methods for automatic identification of SARS-CoV-2**, NIAS Council of Management, NIAS (delivered online), Bengaluru, May 26, 2020.

63. **AI, Machine Learning & Collective Intelligence**, invited lecture (online) as a part of the course on *Transdisciplinarity and Collective Knowledge Frameworks*, University of Trans-Disciplinary Health Science and Technology, Bengaluru, May 22, 2020.

64. **Introduction to the Mathematics of Machine Learning**, refresher course for Computer Science, UGC-HRDC, University of Calicut, January 20, 2020.

65. **Consciousness, Causality & Artificial Intelligence**, Student-Scientist interaction, National Institute of Advanced Studies, Bengaluru, January 14, 2020.

66. **When Neuro-Chaos Meets Machine Learning**, keynote lecture, 4th IEEE International conference on Computational Systems and Information Technology for Sustainable Solutions (CSITSS-2019), RV College of Engineering, Bengaluru, December 21, 2019.

67. **Mathematical Foundations of Machine Learning**, invited expert for a 1-day workshop as a part of 9th International Symposium on Embedded Computing and System Design (ISED 2019), Amrita Vishwa Vidyapeetham, Amritapuri Campus, Kollam, December 16, 2019.

68. **Consciousness Connectedness (in successful leadership efforts)**, invited keynote address, National Workshop on Youth Empowerment (NWEY2019), Vivekananda Janoththana Trust, Bengaluru, December 7, 2019.

69. **Re-visiting the XOR problem: from Perceptron to Chaos**, Invited guest lecture, Dept. of Comp. Sci. & Engg., PES University, Bengaluru, November 20, 2019.

70. **What is Mathematics?**, and **Principles of Mathematical Modeling**, two lectures as a part of Research Methodology course, NIAS, Bengaluru, November 5 & 7, 2019.

71. **Consciousness & Causality: Perspectives from Integrated Information Theory, Kashmir Shaivism and Phenomenology**, Reading Glass Thematic Discussion (along with Dr. Shankar Rajaraman and Dr. Saurabh Todariya), Consciousness Studies Programme, NIAS, Bengaluru, October 25, 2019.

72. **A Brief History of the XOR Problem**, IEEE Computer Society Experts Lectures (CS Connect), Govt. College of Engg., Karwar Karnataka, October 5, 2019.

73. **When Chaos Theory Meets Machine Learning**, IEEE Computer Society Experts Lectures (CS Connect), KLE Technological University, Hubballi, October 4, 2019.

74. **Introduction to Information Theory and its Applications to Machine Learning; Introduction to Chaos Theory and its Applications to Computing and Learning**, as a part of GirlGeeks outreach program organized by IEEE Computer Society, Bengaluru Chapter, BMSIT&M, Yelehanka, Bengaluru, September 14, 2019.

75. **The Limits of Knowing in Science and Mathematics**, NIAS-DST Training Programme on "Science, Technology and Innovation Policy", National Institute of Advanced Studies, Bengaluru, August 22, 2019.

76. **What is Mathematics?**, Vidyashilp Academy, Jakkur, Bengaluru, August 13, 2019.

77. **The XOR Problem: From Perceptron to Chaos**, IEEE Computer Society Experts Lectures, Central University of Karnataka, Kalaburagi, Karnataka, August 9, 2019.

78. **ChaosNet: Chaos Theory Meets Machine Learning**, NeuroAI.in: India's first-ever symposium at the interface of Neuroscience and Data Science, Infosys, Bengaluru, August 3, 2019.

79. **Mathematical Foundations of Neuroscience & Consciousness Studies Research**, series of lectures at NIMHANS, May-August, 2019.

80. **Prospects of Mutlidisciplinary Research**, NIAS MAIYA Talent search Mentor Mentee Workshop 2019-20, organized by NIAS Gifted Education Programme, NIAS, Bengaluru, May 9, 2019.

81. **An Introduction to Cryptography**, Dept. of Computer Science Engg., RV College of Engineering, Bengaluru, April 4, 2019.

82. **The Art and Science of Cryptography: From Ancient to Modern Ciphers**, invited Public talk, organized by ISSSP Programme, NIAS, Bengaluru, March 28, 2019.

83. **Introduction to Wavelets and its Applications to Signal/Image Processing**, technical talk as a part of 2-day *Foundation Course on Image Processing*, Department of Medical Electronics, Ramaiah Institute of Technology, Bengaluru, March 12, 2019.

84. **Science of Consciousness**, All India Radio Bengaluru, *aired* on March 8, 2019 at 7.45 pm IST.

85. **What can we really know? - The Limits of Knowing**, Amrita Vishwa Vidyapeetham, Amritapuri Campus, Kollam, Jan. 4, 2019.

86. **What can we really know? - In Praise of C.I.**, *Reading Glass*, Consciousness Studies Programme, NIAS, Bengaluru, Dec. 27, 2018.

87. **From Brains to Machines: The Puzzle of Consciousness**, invited talk at Mahindra Research Valley, Mahindra World City, Chennai, October 29, 2018.

88. **The Limits of Knowing**, invited talk at The Socratic Club, Mahindra World City, Chennai, October 28, 2018.

89. **Science of Consciousness**, invited talk at NIAS-DST Training Programme on Policy for Science and Science for Policies, NIAS, Bengaluru, October 5, 2018.

90. **What is Mathematics?**, invited talk at Mallya Aditi International School, Yelehanka, Bengaluru, August 29, 2018.

91. **Causality Testing: Practical Approaches & Challenges**, invited talk at Discussion Meeting on *Causally Open Systems*, PPISR campus, Bidlur, Greater Bangalore, July 21, 2018.

92. **ICA, Foundations of Information Theory and Applications to Machine Learning**, Workshop on Foundations of Linear Algebra and Machine Learning, PES Institute of Technology, Bengaluru South Campus, July 17, 2018.

93. **Introduction to Chaos & Chaos-Computing**, as a part of *Celebrating Computing* technical talk series of the IEEE Computer Society Bengaluru Chapter. This talk was hosted by National Institute of Engineering (NIE), Mysuru as a part of their NIE Summer of Code 3.0, June 2, 2018.

94. **Foundations of Matrix Theory, SVD & PCA With Applications**, Workshop on Foundations of Data Science: Theory and Applications, PES Institute of Technology, Bengaluru South Campus, May 17, 2018.

95. **So You Think You Can Count?**, NIAS Wednesday Discussion meeting, NIAS, Bengaluru, May 16, 2018.

96. **From Fourier to Wavelets & Beyond**, Invited guest lecture, Dept. of Electronics & Communications Engg., PES University, Bengaluru, April 20, 2018.

97. **Claude E Shannon and the birth of Digital Computing & Information Science**, inaugural talk of *Celebrating Computing* technical talk series organized by IEEE Computer Society Bengaluru Chapter, PES University, Bengaluru, April 7, 2018.

98. **Altruistic Strategies in Mathematical Games**, technical talk at international seminar on *Altruism, Wellbeing and Purpose: Vantage views on planetary life and its meaning from biology, Indian philosophy and the arts*, organized by METI-international and NIAS Consciousness Studies Programme, NIAS Bengaluru, February 1-2, 2018.

99. **Introduction to Wavelet Theory and its Applications**, technical talk at workshop on *Real Time Signal Processing and its Applications*, Department of Medical Electronics, Ramaiah Institute of Technology, Bengaluru, January 22, 2018.

100. **Mathematical Methods in Neuroscience with Emphasis on EEG Analysis: PCA, ICA & Causality Testing**, technical talk at *One-day Symposium on Current Approaches to EEG Analysis*, CNSI-NIMHANS Lecture Series, NIMHANS, Bengaluru, January 19, 2018. (Granger Causality Testing was delivered by Aditi Kathpalia)

101. **Brain-Mind-Machine: Perspectives from Information Theory & Complexity Science**, technical talk at one-day workshop on *Minds & Machines*, Consciousness Studies Programme, NIAS, December 27, 2017.

102. **From Teaching To Research and Back**, Department of Physics, Amrita University, Amritapuri, September 26, 2017.

103. **From Teaching To Research and Back**, and **Shannon-Style of Research**, workshop on *Technologies and Tools for Scientific Research*, Department of Computer Science, University of Kerala, Kariavattom Campus, September 25, 2017.

104. **Introduction to Complexity Theories of Consciousness**, and **Introduction to Research Methods in Consciousness Studies**, 2 lectures as a part of CSP Module: *An Introduction to Mind, its Functions and Purpose* for First Semester Foundation Course (1 credit), NIAS, Bengaluru, Sep. 1 & Sep. 8, 2017.

105. **Complexity Theories of Consciousness**, *Seminar and Student-Scientist Interaction on Modeling and Research in Neuroscience*, PES University Campus, Bengaluru, August 18 -19, 2017.

106. **Teaching to Research and Back; My experiences of writing successful and unsuccessful project proposals**, Faculty Development Programme at BMSIT&M, Bengaluru, July 27, 2017.

107. **Mathematical Approach to Causality and Consciousness**, part of *A Dialogue and Interactive Session on Beyond the Binary: Exploring Causality and Consciousness*, along with Sangeetha Menon and Shankar Rajaraman, NIAS Consciousness Studies Programme, NIAS Wednesday Discussion, July 26, 2017.

108. **The Limits of Knowing in Science and Mathematics (and the role of Spirituality)**, Science and Spirituality Club, ISKCon, Bengaluru, March 26, 2017.

109. **Research Methods in Consciousness Studies**, lecture as a part of Research Methodology course, February 21, 2017.

110. **'Information'**, *Evening Philosophy Chat*, organized by NIAS Consciousness Studies Programme & Indian Council of Philosophical Research (ICPR), on the occasion of World Philosophy Day, NIAS, November 17, 2016.

111. **'Uncertainty'**, *Evening Philosophy Chat*, NIAS Consciousness Studies Programme, NIAS, October 20, 2016.

112. **The Models For Consciousness**, Syntalk (#TMTC along with Prof. Amita Chatterjee and Prof. V N Jha), Mumbai, October 1, 2016. Link: https://syntalk.wordpress.com/episodes/turn-three/tmfc/.

113. **'The Art and Science of Cryptography', 'Introduction to Communications, Information and Coding Theory', 'The Limits of Computing, Thinking and Knowing'**, invited lectures delivered as a part of refresher Course in Computer Science for College/University teachers, UGC-Human Resource Development Centre (HRDC), University of Calicut, August 26, 27, 2016.

114. **Foundational Ideas of Mathematics**, a set of two lectures as a part of NIAS Foundation course, NIAS, August 23, 2016.

115. **The Life & Work of Claude E Shannon: Celebrating 100 years of Shannon**, workshop delivered at *IEEE Symposium on Education, Technology and Entrepreneurship (ISEE 2016)*, IEEE Student Branch, Amrita Vishwa Vidyapeetham, Amritapuri Campus, Kollam, August 7, 2016.

116. **What is Mathematics?**, Second Summer Workshop under *NIAS Gifted Education Programme*, 12-14th May, 2016.

117. **Uncertainty, Undecidability, Unpredictability: The Limits of Computing, Thinking and Knowing**, NIAS Wednesday Discussion, April 20, 2016.

118. **Research Activities at Consciousness Studies Programme at NIAS**, S-VYASA, November 5, 2015.

119. **From Fourier to Wavelets and Beyond**, a workshop delivered at *IEEE Symposium on Education, Technology and Entrepreneurship (ISEE 2015)*, IEEE Student Branch, Amrita Vishwa Vidyapeetham, Amritapuri Campus, Kollam, August 8-9, 2015.

120. **y=Ax, The Singular Value Decomposition, Introduction to Compressed Sensing and Applications**, M S Ramaiah Institute of Technology, Bengaluru, May 27, 2015.

121. **Uncertainty, Undecidability, Unpredictability: The Limits of Science, Logic and Computation**, PES Institute of Technology (PESIT), Bengaluru, April 24, 2015.

122. **A Gentle Introduction to Chaos**, PSG College of Technology, Coimbatore, April 13, 2013.

123. **Chaos - and its applications to Communications and Computing**, invited talk, *National Conference on Advanced Computing and Communications (NCACC 2013)*, Sree Buddha College of Engineering, Pattoor, Kerala, March 22, 2013.

124. **When Information Meets Chaos: Applications of Symbolic Dynamics**, invited talk, *Mini-Symposia on Time Series Analysis and Fractals, National Conference on Nonlinear Systems and Dynamics (NCNSD 2012)*, IISER Pune, 14 July, 2012.

125. **The Art and Science of Cryptography, Break-the-Code Challenge and How to Read/Write a Research Paper**, Sree Buddha College of Engineering, Pattoor, Kerala, May 16, 2012.

126. **Foundational Ideas of Mathematics**, as a part of Foundation Course for 1st Year PhD students, National Institute of Advanced Studies, IISc. Campus, Bangalore, November 7-8, 2011.

127. **The Art and Science of Cryptography & Break-the-Code Challenge**, PSG College of Technology, Coimbatore, September 29, 2011.

128. **Compressed Sensing: An Introduction**, Samsung India Software Operations (SISO), Bangalore, June 24, 2011.

129. **Appreciation of Mathematics for Engineers**, a set of 7 lectures to a few highly motivated students of S7 ECE, Amritapuri, June 8 - 11, 2011.

130. **Chaos in 1-Dimensional Maps**, GE Global Research Center, John F. Welch Technology Center, Bangalore, May 19, 2011.

131. **Chaos and Cryptography**, A short course offered (jointly with Prof. Prabhakar G. Vaidya (NIAS)) at the invitation of Department of Mathematics, University of Sains Malaysia (USM), Penang, Malaysia, April 13-15, 2011.

132. **An Introduction to Compressed Sensing**, Dept. of Electronics and Comm. Engg., National Institute of Technology Karnataka (NITK), Surathkal, March 23, 2011.

133. **An Introduction to Compressed Sensing**, Tutorial Session, *IEEE LINK Face2Face Meet ECLECTIC'11*, Amrita Vishwa Vidyapeetham, Amritapuri Campus, Amritapuri, March 6, 2011.

134. **Excursions into Mathematics: Some Beautiful Ideas**, as a part of Foundation Course for 1st Year PhD students, National Institute of Advanced Studies, IISc. Campus, Bangalore, Nov. 11-12, 2010.

135. **The Fascinating World of Cryptography**, Sree Buddha College of Engineering, Pattoor, Kerala, August 18, 2010.

136. **The Art and Science of Cryptography**, lectures to class 9-11 kids, Rishi Valley School, July 31, 2010.

137. **From Teaching to Research and Back**, Faculty Development Program, Amrita Vishwa Vidyapeetham, Amritapuri, July 12, 2010. (this talk was presented jointly with Dr. Jayaraj Poroor of Amrita Research Labs)

138. **Chaos, Randomness & Cryptography**, *Prajnaamrita Lecture Series*, Poornaprajna Institute of Scientific Research, Bangalore, June 17, 2010.

139. **Chaos and Communications**, *Prajnaamrita Lecture Series*, Poornaprajna Institute of Scientific Research, Bangalore, June 14, 2010.

140. **The Singular Value Decomposition and its Applications**, Faculty Development Programme, Dept. of Computer Science and Engg., Amrita School of Engineering, Amrita Vishwa Vidyapeetham, Amritapuri, Kerala, Dec 31, 2009.

141. **Introduction to Fourier Representations**, Faculty Development Programme, Dept. of Electronics and Communications Engg., Amrita School of Engineering, Amrita Vishwa Vidyapeetham, Amritapuri, Kerala, Dec 28, 2009.

142. **A Brief History of Cryptography**, *AICTE sponsored National Seminar-Quantum Cryptography*, College of Engineering Perumon, Kollam, November 20, 2009.

143. **The Art and Science of Cryptography: From Ancient to Modern Ciphers**, LNMIIT, Jaipur, August 29, 2009.

144. **Does God Really Need to Play Dice? - On Randomness, Chaos & Cryptography**, LNMIIT, Jaipur, August 29, 2009.

145. **How to Read a Research Paper**, paper reading session (the paper that was chosen was Shamir's 1979 classic paper - "How to Share a Secret"), Dept. of Computer Science, Amrita School of Engineering, Amritapuri Campus, Kollam, 2009.

146. **Introduction to Information and Coding Theory**, Faculty Development Program, Dept. of Electronics and Communications, Amrita School of Engineering, Amritapuri Campus, Kollam, Jan 24-26, 2009.

147. **Novel Applications of Chaos Theory to Coding and Cryptography**, National Institute of Advanced Studies, IISc. Campus, May 22, 2009.

148. **The Unreasonable Effectiveness of the Tent Map and its Cousins in Applications to Communications**, IITM, Chennai, June 5, 2008.

149. **The Unreasonable Effectiveness of the Tent Map**, Institute of Mathematical Sciences (IMSc.), Chennai, June 17, 2008.

150. **From Huffman to Arithmetic Coding & Beyond: A Dynamical System Approach to Source Coding**, Department of Mathematics, University of Manchester, Manchester, UK, September 27, 2007.

151. **A Dynamical Systems Approach to Source Coding and Encryption**, ECE Dept., Indian Institute of Science, March 15, 2007.

152. **Medical Image Compression**, *Advances in Signal Compression Technology, ISTE-AICTE short term training programme*, National Institute of Technology Calicut, Calicut, 06-17 January 2003.

153. Guest Speaker, Conference on Intellectual Property Rights, Indian Institute of Management, Bangalore, December 2001.