

Faculty Profile



Dr. E. Grace Mary Kanaga, M.Tech., Ph.D.
Professor & Head
Division of Data Science and Cyber Security
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Academic Background

Degree	University	Year
Ph.D	Anna University of Technology, Coimbatore, India	2011
M.Tech	Vellore Institute of Technology (VIT), Vellore, India	2002
B.E	Adhiyamaan College of Engineering, Hosur, India	1997

Courses Taught

- Cognitive Computing
- Big Data and Analytics
- Machine Learning
- Distributed Computing
- Mobile Communication and Computing
- Windows Programming
- Database Management Systems
- Programming in C++
- Java Programming
- Artificial Intelligence
- Real Time Systems
- Software Agents
- Visual Programming
- Advanced Database Technologies

Research Interests

- Brain Computer Interface
- Computational Intelligence
- Big Data Analytics
- Optimization Techniques
- Data Science

1. Title: T-285: Design and Development of an Adaptive Brain Computer Interface (BCI) based Assistive Tool for Paralytic People
Funding Agency: DST- ICPS
Sanctioned Amount : **Rs. 38, 84,372**
Sanctioned Order: [DST/ICPS/CLUSTER/Data Science/2018 / General dated 7/1/2019]
Duration : May 2019 to September 2023
Status : Completed
2. Title: Smart Wearable Device for Early Prediction and Alerting of Epilepsy in Pre-ictal Phase using Advanced Learning Techniques
Funding Agency: IDEAS- TIH, DST
Sanctioned Amount : **Rs. 29,72,520**
Sanctioned Order: [OO/ISI/IDEAS-TIH/2023 -24/32 dated 12-07-23]
Duration : 3 years
Status : On-going

PUBLICATIONS

BOOK CHAPTERS

- Babu, N.V., **Grace Mary Kanaga, E.** (2023). Multiclass Text Emotion Recognition in Social Media Data. In: Sisodia, D.S., Garg, L., Pachori, R.B., Tanveer, M. (eds) Machine Intelligence Techniques for Data Analysis and Signal Processing. Lecture Notes in Electrical Engineering, vol 997, pp. 371-387, Springer, Singapore. https://doi.org/10.1007/978-981-99-0085-5_30
- Gerard Joe Nigel K., Anand N., **Grace Mary Kanaga E.**(2022), Intelligent Facility Management System for Self-sustainable Homes in Smart Cities: An Integrated Approach Smart Urban Computing Applications, pp. 191 - 205
- **E. Grace Mary Kanaga**, M.L. Valarmathi and J. Dhiviya Rose, Lincy Grace Kanagaselvi (2022), An Intelligent Agent-Based Distributed Patient Scheduling Using Token-Based Coordination Approach: A Case Study, Evolving Predictive Analytics in healthcare – New AI Techniques for Real-time interventions, Chapter 11, pp. 224 – 242, IET
- M. Bhuvaneshwari, **E. Grace Mary Kanaga**, J. Anitha, Kumudha Raimond, and S. Thomas George (2021), A comprehensive review on deep learning techniques for a BCI-based communication system, Demystifying Big Data, Machine Learning, and Deep Learning for Healthcare, Chapter 7, Pages 131-157, Elsevier. (Scopus Indexed)
- Bhuvaneshwari, M., **Grace Mary Kanaga, E.** (2021), Classification of VEP-Based EEG Signals Using Time and Time-Frequency Domain Features, Lecture Notes on Data Engineering and Communications Technologies, Volume 57, Pages 737-747 (DOI:10.1007/978-981-15-9509-7_60) (Scopus Indexed)
- **E. Grace Mary Kanaga**, J. Anitha, D. Sujitha Juliet (2020), “4D medical image analysis: a systematic study on applications, challenges, and future research directions”, Advanced Machine Vision Paradigms for Medical Image Analysis- A volume in Hybrid Computational Intelligence for Pattern Analysis and Understanding, Chapter – 4, pp. 97 -126, Elsevier
- R.V.Belfin, **E.Grace Mary Kanaga** (2020), Recent Advances in Hybrid Metaheuristics for Data Clustering, Application of Machine Learning in the Social Network., Sourav De , Sandip Dey, Siddhartha Bhattacharyya, Chap-4, 61-78, Wiley, ISBN: 9781119551591

- [1]. Paul, A. R., & **Grace Mary Kanaga, E.** (2024). Enhanced D-CNN architecture and centroid-based algorithm for real-time vehicle tracking and accident detection from surveillance videos. *Journal of Intelligent & Fuzzy Systems*, (Preprint), 1-14.
- [2]. John, R. R., **Kanaga, G. M.**, & Sandeep, S. G. (2024). An AVL Tree Based Algorithm for Virtual Machine Placement Problem. *International Journal of Intelligent Systems and Applications in Engineering*, 12(9s), 420-426.
- [3]. John, R. R., **Kanaga, E. G. M.**, Lovesum, J., & Sandeep, S. G. (2024). An Enhanced Approximation Algorithm Using Red Black Tree and HashMap for Virtual Machine Placement Problem. *SN Computer Science*, 5(1), 153.
- [4]. **Grace Mary Kanaga, E.**, Rajakumar, A. E., Raimond, K., & Jeevanayagam, A. (2023). Automatic channel selection using shuffled frog leaping algorithm for EEG based addiction detection. *TELKOMNIKA (Telecommunication Computing Electronics and Control)*, 21(5), 1121-1129.
- [5]. Bhuvaneshwari, M., **Grace Mary Kanaga, E.**, Anitha, J., (2023), Bio-inspired Red Fox-Sine cosine optimization for the feature selection of SSVEP-based EEG signals for BCI applications, *Biomedical Signal Processing and Control*, 80, 104245 DOI:10.1016/j.bspc.2022.104245. [SCI Indexed , IF: 5.076]
- [6]. Bhuvaneshwari M., **Grace Mary Kanaga E.**, George S.T.(2023), Classification of SSVEP-EEG signals using CNN and Red Fox Optimization for BCI applications, Part H: *Journal of Engineering in Medicine*, Vol. 237 (1), 134 – 143, DOI: 10.1177/09544119221135714 [SCI Indexed , IF: 1.79]
- [7]. Babu, N.V., Kanaga, E.G.M., (2022), Sentiment Analysis in Social Media Data for Depression Detection Using Artificial Intelligence: A Review, *SN Computer Science*,3(1),74 . DOI: 10.1007/s42979-021-00958-1 [Scopus Indexed]
- [8]. Resmi Cherian, **E. Grace Mary Kanaga**, Theoretical and methodological [analysis of EEG based seizure detection and prediction: An exhaustive review, *Journal of Neuroscience Methods*, Volume 369, 2022, 109483, Elsevier. [<https://doi.org/10.1016/j.jneumeth.2022.109483>] [SCI Indexed, IF: 2.39]
- [9]. Radha Subramanyam, G. Josemin Bala, Nagabushanam Perattur, **E. Grace Mary Kanaga** (2022), "Energy Efficient MAC with Variable Duty Cycle for Wireless Sensor Networks", *International Journal of Electronics*, 109(3), pp. 367–390 [<https://doi.org/10.1080/00207217.2021.1892202>] (SCI Indexed) [Impact Factor 1.004]
- [10]. Radha. S, Bala. G.J, **E. Grace Mary Kanaga**, Nagabushanam, P.C (2020), "Scheduling and adaptive listening approaches in MAC for WSN applications: A survey", *Journal of High Speed Networks*, Volume 26, Issue 4, 2020, Pages 325-338 (SCI Indexed)
- [11]. S. Seetha, Sharmila Anand John Francis, **E. Grace Mary Kanaga**, Esther Daniel (2020), "ESAM - Energy Saving Slot Allocation Based Multicast Routing in Wireless Mesh Network", *EAI Endorsed Transactions on Energy Web*, SCI indexed, Impact Factor: 0.38, ISSN: 2032944X.

- [12]. Sminesh, C.N., **Grace Mary Kanaga, E.**, Sreejish, A.G. (2020), A multi-controller placement strategy in software defined networks using affinity propagation, International Journal of Internet Technology and Secured Transactions, 10(1-2), pp. 229-253. (Scopus Indexed – SJR : 0.314)
- [13]. C. N. Sminesh, **E. Grace Mary Kanaga**, and A. G. Sreejish (2020), Augmented Affinity Propagation-Based Network Partitioning for Multiple Controllers Placement in Software Defined Networks, Journal of Computational and Theoretical Nanoscience ,Vol. 17, 228–233. (Scopus Indexed)
- [14]. Sminesh, C.N., **Mary Kanaga, E.G.**, Roy, A. (2019), Optimal multi-controller placement strategy in SD-WAN using modified density peak clustering, IET Communications, 13 (20), pp. 3509-3518 (SCI indexed IF : 1.779)
- [15]. Hepsiba, P. S., & **Grace Mary Kanaga, E.** (2019). Intelligent scheduling of bag-of-tasks applications in the cloud. International Journal of Advanced Computer Science and Applications, 10(5), 473-480. (SCIE indexed)
- [16] Seetha, S., Sharmila Anand, J. F., & **Grace Mary Kanaga, E.** (2019). RFSMPF: Rank based forwarder selection in MCAST with fuzzy optimized path formation in wireless mesh network. *Wireless Networks*, doi:10.1007/s11276-019-02091-7 Impact Factor: 2.45., (SCI indexed)

Ph. D / UG & PG Projects Guided

Ph. Guidance

- Successfully guided four Ph.D. Scholars
- Currently guiding 6 scholars

UG & PG Projects Guidance

Guided more than 50 PG and UG projects in the following domains

- Evolutionary Optimization Techniques
- Intelligent Agents Computational Intelligence
- Distributed Systems
- Image Processing
- Mobile Computing
- Brain Computer Interface
- Big data Analytics

Memberships in Professional societies

- Member of CSI – 0072873
- Member of IADIS - 20090137
- Member of IEEE - 92177445
- Member of ASDF - 4357700016860829
- Member of MIR Lab (Machine Intelligence Research Lab)

Significant achievements:

Awards :

- Received “The Best Computer Science Faculty Award” for the year 2013 by ASDF.
- Received “Innovative Professional Award” from Society of Professional Engineers, 2016
- Received “National Young Leaders Programme Award” from Ministry of youth affairs and sports, NSS Regional Directorate Chennai for the outstanding contribution of community service through NSS, 2017

Other Accomplishment

- Served as a BOS member in Jothi Nivas College, Bangalore
 - Serving as a member in Governing council of Nehru Institute of Engineering and Technology, Coimbatore from 18th January 2016.
 - Serving as a member in Academic council of Kalaignar Karunanidhi College of Engineering, Coimbatore from 2015
 - Served as a BOS member in Jothi Nivas College, Bangalore
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JOURNAL AND CONFERENCE REVIEWER

- Reviewed Papers in various International Conferences
 - Reviewer of the international journal Physica , Elsevier Publication
 - Reviewer of the international journal, "Mathematical Problems in Engineering", Hindawi Publishing Corporation
 - Reviewer with the Indian Journal of Science and Technology
 - Reviewer of the international journal, " Journal of Scheduling", Springer
 - Reviewer of DEXTRA -National Symposium 2005
 - Editorial Advisory Board for "*Handbook of Research on Network Security Attacks and Counter Measures*", IGI Global
 - Co-Editor for the CSE News Letter
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CONFERENCE SESSION CHAIR, RESOURCE PERSON AND INVITED TALKS

- Invited talk on , " SVM and Neural Networks" in the DST-ICPS sponsored three days National workshop on Intelligent Automation through Machine Learning conducted on 27-12-2020 at GNIT, Hyderabad.
- Invited talk on, "Cybercrime & Forensics" in the ICSSR Sponsored One-Day National Seminar on "Digital Cyber Security Forensics – Issues and Challenges" is held on 02-12-2019 at Sankara Campus
- Invited talk on, "AI for Societal Welfare" in the IBM Meet up conducted on 12-10-2019 at Karunya City Centre.
- Invited talk on , " Big Data Analytics and NoSQL Databases" in the DST sponsored two weeks FDP on Data Science and Big Data Analytics conducted during June 10th to 23rd at SRM- Easwari Engineering College, Chennai.
- Track Chair of Cloud and Data Analytics in the International conference on Big Data and Cloud Computing, April 2017
- Invited talk on " Cloud Sourcing and Agent Development using JADE" in the QIP short term course on Next Generation Computing conducted by CSE Department of Coimbatore Institute of Technology, Coimbatore during 28 - 4- 2017
- Invited talk on "Data Science and Big Data and Analytics" in the workshop conducted by Jeyaraj Annapackiam College of Engineering, Nazareth during 23-6-17.
- Invited talk on " Open source Software Tools for Big Data Analytics ", in the FDP Conducted by Government Engineering College, Trissur, 13-7-2016

- Invited talk on “ NoSQL Databases: MongoDB and Cassandra”, in the DST sponsored FDP Conducted by Kongu Engineering College, 15-6-2016
 - Special lecture delivered on “NoSQL Databases” in the Text Analytics and Stream Computing Workshop conducted by KU during 17 March 2016
 - Invited talk on IoT and Big Data Analytics in the International Conference on Innovations in Science and Technology conducted by SriGuru Institute of Technology during 31 March 2016
 - Invited talk on “Distributed Systems” in the FDTP conducted by Sri Ramakrishna Engineering College, Coimbatore during December, 2015
 - Invited talk on “ Big Data and Analytics” in the Seminar conducted by Jeyaraj Annapackiam College of Engineering, Nazareth during October, 2015
 - Keynote Speaker for the National Conference conducted by CARE Engg. College, Trichy during March 2014
 - Invited talk on FDTP conducted by Akshaya Enggg. College, Coimbatore during June, 2014
 - Key note address on National Level Seminar conducted by SRIT, during March 2014
 - Chair the session in National Conference conducted by CARE Engg. College, Trichy during March 2014
 - Judge for Paper presentation in National Level Symposium – Techagon – ’14, conducted by KU, during March 2014
 - Co-Chair the Session for Paper Presentation in International Conference - ICICTS -14 conducted by KU, Coimbatore during March 2014
 - Chair the Session in International Conference on Innovations In Intelligent Instrumentation, Optimization And Signal Processing, conducted by KU, March 2013
 - Judge for National Level Project Contest conducted by CSI, February, 2013
 - Invited talk on FDP conducted by PSG Tech, during June, 2013
 - Special lecture delivered on “Software Agents and Cloud Computing” in the Cloud Computing and Software Agents Workshop conducted by KU during September 2012
 - Advisory Committee member for national conference on Information Computing & Management Challenges in Contemporary Business, Bangalore, October 2011
 - Session chair in National Level Symposium – Elements, February 2012
 - Gave the Inaugural Address for the Association Inauguration in ASL Paul Engineering College, March 2012
 - Special Lecture delivered in a Workshop conducted by Karpagam University, during July 2010
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Co-CURRICULAR ACTIVITIES

- NSS Programme officer for more than 15 years