

# Dr. Aravinthan Devarasu

## Senior Lecturer and Head

Department of Sciences, Mathematics and Education

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## Education

<b>Bharathidasan University</b> <i>M.B.A., CGPA: 7.01</i>	<b>Tiruchirappalli</b> 2017–2019
<b>Bharathidasan University</b> <i>Ph.D., Physics, Highly Commended</i>	<b>Tiruchirappalli</b> 2011–2017
<b>Bharathidasan University</b> <i>M.Phil., Physics, First Class with Distinction, 77.00%</i>	<b>Tiruchirappalli</b> 2010–2011
<b>Bharathidasan University</b> <i>M.Sc., Physics, First Class with Distinction, 80.02%</i>	<b>Tiruchirappalli</b> 2008–2010
<b>Nehru Memorial College (Autonomous) (Bharathidasan University)</b> <i>B.Sc., Physics, First Class with Distinction, 85.16%</i>	<b>Puthanampatti</b> 2005–2008
<b>Nehru Higher Secondary School (State Board, Tamil Nadu)</b> <i>H.S.C., First Class with Distinction, 83.66%</i>	<b>Puthanampatti</b> 2003–2005
<b>Government High School (State Board, Tamil Nadu)</b> <i>S.S.L.C., First Class with Distinction, 82.40%</i>	<b>Thinnanur</b> 2002–2003

## Academic Experience

<b>Senior Lecturer</b> Working as a Senior Lecturer and Head of Department of Sciences, Mathematics and Education, St. Joseph University in Tanzania, Dar es Salaam, Tanzania.	January 2024– Till date
<b>Assistant Professor</b> Working as an Assistant Professor in Centre for Nonlinear Systems, Department of Science & Humanities, Chennai Institute of Technology, Chennai, Tamilnadu.	November 2021–December 2023
<b>Guest Faculty</b> Worked as a Freelance Researcher, C, Python Trainer & Guest Faculty in E2 Academy, Tiruchirappalli, Tamilnadu.	June 2020 – October 2021

### **Assistant Professor**

July 2018– May 2020

Worked as an Assistant Professor (on contract) in Department of Physics, Central University of Tamilnadu, Thiruvavur.

### **Research Associate**

2017–2018

Worked as a Research Associate in the CSIR Project entitled "Spin Torque Nano Oscillators (STNO)" under the supervision of Prof. M. Lakshmanan in Bharathidasan University.

### **Courses Handled**

**Theory Courses Handled:** Atomic and Molecular Physics, Engineering Physics, Computational Physics, Numerical Methods and Computer Programming with C, Electricity and Magnetism, Numerical Physics (Using Python)

**Laboratory Courses Handled:** Engineering Physics Lab, Computational Lab (C Language), Advanced Computational Lab (Matlab/ Octave/ Python), Electricity and Magnetism Lab

### **Ph.D. Guideship**

Anna University Supervisor ID: 3970025

### **Ph.D. Work**

**Title:** *Effect of Interlayer Coupling and Biasing on Spin Transfer Torque Switching in Ferromagnetic Nanopillars*

**Supervisor:** Prof. M. Daniel

### **Patents**

- Invention Title : IoT and Cloud based voice with advance automation system using Google Assistant  
Reference No. : 202241050081                      Publication No.: 36/2022    Dated: 09/09/2022  
Filed with            : Indian Patent Rights            Status: Published
- Invention Title : IoT enabled energy efficient advanced 6G communication network system  
Reference No. : 202241053255                      Publication No.: 38/2022    Dated: 23/09/2022  
Filed with            : Indian Patent Rights            Status: Published
- Invention Title : System for load balancing in cloud computing using machine learning  
Reference No. : 202341002106                      Publication No.: 03/2023    Dated: 20/01/2023  
Filed with            : Indian Patent Rights            Status: Published

### **Publications**

- [1] K. Manikandan, N. Serikbayev, D. Aravinthan, and K. Hosseini, Solitary wave solutions of the conformable space–time fractional coupled diffusion equation, Partial Differential Equations in Applied Mathematics, 100630 (2024).

- [2] D. Aravinthan, H. Boomeswaran, P. Sabareesan, K. Manikandan, and J. B. Sudharsan, Enhancement of spin-torque-triggered magnetization reversal in pentalayer ferromagnetic alloys through orange peel coupling, *Brazilian Journal of Physics* **54**, 32 (2024).
- [3] H. Boomeswaran, D. Aravinthan, and P. Sabareesan, Tunability of microwave frequency using spin torque nano oscillator by the generated oersted field with tunable free layer, *Spin*(Accepted) (2023).
- [4] M. Boopathi, R. Sujatha, C. Senthil Kumar, D. Aravinthan, and S. Sadhasivam, Data-flow coverage-oriented test data generation using artificial fish school algorithm in software testing, *Math. Comput. Simu.*(Under Review) (2023).
- [5] S. Sabarathinam, D. Aravinthan, V. Papova, R. Vadivel, and N. Gunasekaran, Least fractional-order nonlinearity in an memristor based chua oscillator, *Fractional Calculus and Applied Analysis*(Under Review) (2023).
- [6] K. Manikandan, N. Serikbayev, S. P. Vijayasree, and D. Aravinthan, Controlling matter-wave smooth positons in Bose–Einstein condensates, *Symmetry* **15**, 1585 (2023).
- [7] K. Manikandan, K. Sakkaravarthi, J. B. Sudharsan, and D. Aravinthan, Deformation of optical solitons in a variable-coefficient nonlinear Schrödinger equation with three distinct PT -symmetric potentials and modulated nonlinearities, *Chaos* **33**, 063132 (2023).
- [8] K. Manikandan, D. Aravinthan, J. B. Sudharsan, and R. Vadivel, Optical solitons in the generalized space–time fractional cubic–quintic nonlinear Schrödinger equation with a PT-symmetric potential, *Optik* **271**, 170105 (2022).
- [9] D. Aravinthan, P. Sabareesan, K. Manikandan, and J. B. Sudharsan, The effect of oscillatory interlayer exchange coupling on current-induced magnetization switching in pentalayer nanopillar alloys, *Appl. Phys. A* **128**, 910 (2022).
- [10] D. Aravinthan and P. Sabareesan, Magnetization switching by orange peel coupling in pentalayer nanopillar with dual polarizer, *Eur. Phys. J. Plus* **137**, 994 (2022).
- [11] J. B. Sudharsan, V. K. Chandrasekar, K. Manikandan, D. Aravinthan, and G. Saadhana, Dynamics of stable solitons in complex ginzburg–landau equation with pt-symmetric gaussian potential, *Optik* **268**, 169796 (2022).
- [12] J. B. Sudharsan, K. Manikandan, and D. Aravinthan, Stabilization of solitons in collisionally inhomogeneous higher-order nonlinear media with pt-symmetric harmonic-gaussian potential with unbounded gain-loss distributions, *Eur. Phys. J. Plus* **137**, 860 (2022).
- [13] K. Manikandan, D. Aravinthan, J. B. Sudharsan, and S. Reddy, Soliton and rogue wave solutions of the space-time fractional nonlinear Schrodinger equation with PT-symmetric and time-dependent potentials, *Optik* **266**, 169594 (2022).

- [14] D. Aravinthan, P. Sabareesan, K. Manikandan, and J. B. Sudharsan, Magnetization switching in pentalayer nanopillar with oscillatory interlayer exchange coupling, *J. Supercond. Nov. Magn.* **35**, 2831 (2022).
- [15] D. Aravinthan, P. Sabareesan, and M. Daniel, Spin transfer torque switching in pentalayer nanopillar with biquadratic coupling, *J. Supercond. Nov. Magn.* **31**, 2567 (2018).
- [16] D. Aravinthan, P. Sabareesan, and M. Daniel, Reduction of switching time in pentalayer nanopillar device with different biasing configurations, *J. Magn. Mater.* **421**, 409 (2017).
- [17] D. Aravinthan, P. Sabareesan, and M. Daniel, Effect of biquadratic coupling on current induced magnetization switching in Co/Cu/Ni-Fe nanopillar, *AIP Conf. Proc.* **1731**, 130032 (2016).
- [18] D. Aravinthan, P. Sabareesan, and M. Daniel, Impact of biquadratic coupling on critical current density in Co/Cu/Ni-Fe nanopillar, *AIP Conf. Proc.* **1728**, 020443 (2016).
- [19] D. Aravinthan, P. Sabareesan, and M. Daniel, Current induced magnetization switching in Co/Cu/Ni-Fe nanopillar with orange peel coupling, *AIP Advances* **5**, 077166 (2015).

## Awards, Grants & Honours

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- Awarded **2016 Joint MMM-Intermag Conference Student Travel Grant** for participating in the 2016 Joint MMM-Intermag Conference, held at the Hilton San Diego Bayfront Hotel in San Diego, California, United States during January 11-15, 2016.
- Awarded **DST – INSPIRE Senior Research Fellowship (SRF)** (from August 28, 2015 to September 30, 2016).
- Won the **Best Library User Award** for the year 2013 awarded by University Library, Bharathidasan University, Tiruchirappalli.
- Awarded **DST – INSPIRE Junior Research Fellowship (JRF)** (from October 01, 2011 to August 27, 2015).
- Awarded **Tmt. Rukmani Gopalan Memorial Gold Medal 2010** for the First Rank in the M.Sc., Physics (2008-2010) Examinations in Bharathidasan University, Tiruchirappalli.
- Secured the **University First Rank** in the Bharathidasan University Rank Examinations conducted for both Autonomous and Non-Autonomous colleges for M.Sc., Physics (2008-2010).
- Got **First Rank in First and Second Year of B.Sc Academic Examinations** in Nehru Memorial College (Autonomous), Puthanampatti.

## Research Interests

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- Spintronics, Magnetic Materials, Nonlinear Dynamics

## Papers Presented in Seminars / Conferences / Workshops

1. Presented a talk entitled "Magnetization Switching in Pentlayer Nanopillar Alloys with Oscillatory Interlayer Exchange Coupling" as an invited speaker in the **Complex System Seminar Series** organized by Laboratory of Complex System modelling and Control, Faculty of Computer Science, National Research University, High School of Economics, Moscow, Russia held on November 10, 2022.
2. Served as a Resource Person for the One Day Workshop on **L<sup>A</sup>T<sub>E</sub>X: A document preparation tool for writing Research Thesis** organized by Department of Computer Science and Engineering, Government College of Engineering Srirangam, Trichy held on March 04, 2022.
3. Served as a Resource Person for the **Five Day Online Programme on Skill Development using Learning Assistance Tools** organized by the PG and Research Department of Physics, Jamal Mohamed College (Autonomous), Trichy held on July 11 - 17, 2020.
4. Served as a Resource Person for the **Summer Online Training Programme on L<sup>A</sup>T<sub>E</sub>X** organized by the PG and Research Department of Physics, Jamal Mohamed College (Autonomous), Trichy held on June 15 - 19, 2020.
5. Served as a Memembr of Organising Committee of the **International Conference on Sustainable Energy Technologies (i-SET - 2018)** Jointly organized by School of Physics & School of Chemistry, Bharathidasan University, Tiruchirappalli, Tamilnadu during June 27 - 28, 2018.
6. Served as a Resource Person for the **One day Workshop on L<sup>A</sup>T<sub>E</sub>X** jointly Organized by Department of Physics and Department of Mathematics, Dr.SNS Rajalakshmi College of Arts & Science(Autonomous), Coimbatore, Tamilnadu held on February 02, 2018.
7. Presented a talk entitled "Impact of Biquadratic Coupling on Spin Current Induced Magnetization Switching in Pentlayer Nanopillar" in the **5<sup>th</sup> International Conference on Complex Dynamical Systems and Applications (CDSA), 2017** organized at Indian Institute of Technology Guwahati, Guwahati, India during December 04 - 06, 2017.
8. Presented a talk entitled "Spin Transfer Torque Magnetization Switching in Ferromagnetic Nanopillars with Orange Peel Coupling" in the **National Conference on Current Advancement in Physics** organized by Department of Physics, St. John's College, Palayamkottai, Tamilnadu, India during February 03-04, 2017.
9. Presented a poster entitled "Impact of Biquadratic Coupling on Current Induced Magnetization Switching in Co/Cu/Ni-Fe Nanopillar" in the **2016 Joint MMM - Intermag Conference** held at the Hilton San Diego Bayfront Hotel in San Diego, California, United States during January 11-15, 2016, jointly sponsored by AIP Publishing and IEEE Magnetics Society.

10. Presented a poster entitled “Effect of Biquadratic Coupling on Current Induced Magnetization Switching in Co/Cu/Ni-Fe Nanopillar” in the **60<sup>th</sup> DAE Solid State Physics Symposium** held at Amity University U.P., Noida, Uttar Pradesh, India during December 21-25, 2015.
11. Presented a poster entitled “Impact of Biquadratic Coupling on Critical Current Density in Co/Cu/Ni-Fe Nanopillar” in the **International Conference on Condensed Matter and Applied Physics (ICC 2015)** organized by Govt. Engineering College, Bikaner, Rajasthan, India during October 30-31, 2015.
12. Presented a poster entitled “Spin Transfer Torque Switching in Pentalayer Nanopillar Having Two Pinned Layers with Biasing” in the **Physics and Applied Mathematics Researchers’ Meet – 2015** held at Indian Statistical Institute, Kolkata, India during March 18-20, 2015.
13. Presented a poster entitled “Spin Transfer Torque Switching in Pentalayer Nanopillar” in the **Indo-Japan Workshop on Magnetism at Nanoscale (IJWMN-2015)** Organized by National Institute of Science Education and Research (NISER), Bhubaneswar, India during January 09-12, 2015.
14. Presented a poster entitled “Impact of orange peel coupling on magnetization switching in nanopillar” in the eighth **Conference on Nonlinear Systems and Dynamics (CNSD 2013)** Organized by Indian Institute of Technology(IIT), Indore, India during December 11-14, 2013.

## Participations in Seminars / Conferences / Workshop / Training Programmes (Selected)

1. November 25-26, 2022: **Workshop on Nonlinear Dynamics in Science & Engineering** organized by Centre for Nonlinear Science & Engineering (CeNSE), Department of Physics, School of Electrical & Electronics Engineering, SASTRA Deemed University, Thanjavur, Tamil Nadu.
2. September 29-30, 2022: **Workshop on Computational Physics with Python** organized by Department of Physics, Bharathidasan University, Tiruchirappalli, Tamilnadu.
3. June 27-28, 2018: **International Conference on Sustainable Energy Technoligies (i-SET - 2018)** Jointly organized by School of Physics & School of Chemisttry, Bharathidasan University, Tiruchirappalli, Tamilnadu.
4. February 13, 2018: **Asia Pacific Academy of Materials (APAM) Special Lecture Series** Jointly Organized by MRSI - Trichy Chapter & Centre for High Pressure Research, Bharathidasan University, Tiruchirappalli – 620 024, Tamilnadu.

5. February 14-16, 2017: **Mini Winter School on Python 2017** Organized by Centre for Nonlinear Science, PG and Research Department of Physics, Government College for Women (Autonomous), Kumbakonam, Tamilnadu.
6. January 20, 2015: **International Workshop on Strongly Correlated Materials** Organized by Centre for High Pressure Research, School of Physics, Bharathidasan University, Tiruchirappalli, Tamilnadu.
7. December 08 - 20, 2014: **Science Academies' Refresher Course on Classical Mechanics and Electromagnetism** Organized by Department of Physics, Sri Dharmasthala Manjunatheswara College (Autonomous), Ujire , Karnataka.
8. September 15 - 17, 2014: **International Conference on Magnetic Materials and Applications (ICMAGMA 2014)** Organized by Department of Physics, Pondicherry University, Puducherry.
9. August 12, 2014: **National Workshop on Resources and Technologies for Scholarly Information** Organized by Department of Library and Information Science, Bharathidasan University, Tiruchirappalli, Tamilnadu.
10. February 24 - March 01, 2014: **NMI Workshop on Nonlinear Integrable Systems and their Applications** Organized by the Centre for NonlinearDynamics, School of Physics, Bharathidasan University, Tiruchirappalli, Tamilnadu.
11. January 27 - 31, 2014: **Training Programme on Research Writing** Organized by Centre for Technical Writing and Academic Writing, Bharathidasan University, Tiruchirappalli, Tamilnadu.
12. January 11 - 14, 2013: **Conference on Condensed Matter and Biological Systems (CCMB13)** Organized by Department of Physics, Banaras Hindu University, Varanasi, Uttar Pradesh.
13. July 12-15, 2012: **Seventh National Conference on Nonlinear Systems and Dynamics (NCNSD2012)** Organized by Indian Institute of Science Education and Research (IISER), Pune, Maharashtra.
14. December 19-22, 2011: **Workshop on Theoretical Physics** Organized by the Department of Physics, Bharathiyar University, Coimbatore, Tamilnadu.
15. January 04 - 26, 2011: **DST-SERC School on Nonlinear Dynamics** Organized by the Centre for Nonlinear Dynamics, School of Physics, Bharathidasan University, Tiruchirappalli, Tamilnadu.
16. August 12 - 17, 2010: **ICM 2010 Satellite Conference on Integrable Systems and Geometry** Conducted by Dept of Mathematics, Pondicherry University, Puducherry.
17. December 08-14, 2009: **Second Science Conclave: A Congregation of Nobel Laureates**

Conducted by Indian Institute of Information Technology, Allahabad, Uttar Pradesh.

18. May 25 – June 19, 2009: **Summer Training Programme in Physics** Organized by Department of Nuclear Physics, University of Madras, Chennai, Tamilnadu.

## Computer Skills

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**Operating System:** Linux (Ubuntu, Fedora), Windows, macOS

**Programming Languages:** FORTRAN, C, C++, Python

**Applications:** L<sup>A</sup>T<sub>E</sub>X, Gnuplot, GIMP, MS Office, OpenOffice, LibreOffice

**Specialized Software:** OOMMF, Matlab/ Octave

**Installation & debugging:** Very Good Knowledge in installing and debugging Softwares & Operating Systems. Also have a good knowledge on domain configurations, website design & e-content creation.

## Languages

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**Tamil:** Read, Write & Speak

*Mother Tongue*

**English:** Read, Write & Speak

*Fluent*

## Co-Curricular Activities

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- Hosted The Grand Quiz - 2019 & 2020 editions part of National Science Day Celebrations organised by Department of Physics, Central University of Tamilnadu, Thiruvavur.
- Served as a Department Newsletter Committee Member from February - 2019 to May - 2020 in Department of Physics, Central University of Tamilnadu, Thiruvavur.
- Served as a Examination Committee Member for End Semester Examinations - November 2018, April 2019 & November 2019 conducted by Department of Physics, Central University of Tamilnadu, Thiruvavur.
- Reviewer in Applied Physics Letters (AIP Publication), Pramana.
- Served as a Residential Warden during 2018 - 2019 at New Boys Hostel, Central University of Tamilnadu, Thiruvavur.
- Served as a Treasurer of Physics Association for Creativity and Excellence (PACE) (2012-2013) in Bharathidasan University, Tiruchirappalli.
- Organized Teacher's Day Celebrations 2012, National Science Day celebrations 2013 & 2015 in School of Physics, Bharathidasan University with two other colleagues.
- Served as a Accounts Committee Member (2008-2009) in Post Graduation Hostel for Men in Bharathidasan University.
- Served as a Member in Accounts Committee (2012-2013) & (2015-2016), Hostel Rules and Regulations formation Committee (2015) & Web-maintenance Committee (2015-2016).

- Designed a Website for Physics Association for Creativity and Excellence (PACE) & for National Science Day Celebrations with Online Registration, Comments / Feedback facility.
- Served as the Class Representative in Under-Graduate, Post-Graduate & M.Phil Programme.

## Interests

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**Reading:** Reading Books especially Essays, Biographies, and Novels

**Blogging:** Maintaining Educational Related Information Blog for the past 10 years and it crosses more than 5 lakh visits

## References

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### Department Head

**Prof. K. Thamilaran**

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Centre for Nonlinear Systems  
Chennai Institute of Technology  
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Tamilnadu, India.

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### Supervisor

**Prof. M. Daniel**

Professor in Physics (Retd.)  
Department of Nonlinear Dynamics  
School of Physics  
Bharathidasan University  
Tiruchirappalli – 620 024,  
Tamilnadu, India.

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### Collaborator

**Dr. P. Sabareesan**

Assistant Professor (Research)  
Centre for Nonlinear Science and Engineering  
School of Electrical and Electronics Engineering  
SASTRA University  
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Tamilnadu, INDIA

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## Personal Details

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Father's Name	<b>P. Devarasu</b>
Mother's Name	<b>D. Vijayalakshmi</b>
Date of Birth	<b>29.07.1987</b>
Age	<b>36</b>
Marital status	<b>Married</b>
Spouse's Name	<b>S. Sivaranjani</b>
Child's Name	<b>A. Magizhnan</b>
Nationality	<b>Indian</b>
Passport Number	<b>M0527487</b>
Religion	<b>Hindu</b>
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