Avinashilingam Institute for Home Science and Higher Education for Women
(Deemed to be University under Category 'A' by MHRD, Estd. u/s 3 of UGC Act 1956)
Re-accredited with 'A^+' Grade by NAAC. Recognised by UGC under Section 12B
Coimbatore - 641 043, Tamil Nadu, India

6.2.1 Strategic Plan Deployment Documents

Avinashilingam Institute for Home Science and Higher Education for Women

(Deemed-to-be-University Est. u/s 3 of UGC Act 1956) Coimbatore, Tamil Nadu)

Women's University catering to the 'Underprivileged to the Society

Academic - Quality Education

- Aided Programmes
- Self Finance Programmes
- Campus Development — Buildings
- ICT Development — Infrastructure
- Other Development programmes- CARE, Nutrition counseling, IHEC, IAEC
- Equipment (ICT enabled)

Study Centres

- Women Studies
- Ambedkar Study Centre
- Gandhian Study Centre

Perspective Plan for Five Years (2018 -2023)

Outreach Programmes

Existing

- Child Health Nutrition
- Traditional / Folk media
- NSS, NCC, Sports
- Swatch Bharat
- Unnat Bharat Abhiyan
- Digital India
- CII YI

Proposed

- Schemes and services for persons with disability
- Digital Health Care
- Evaluation of ICDS Centres
- Nutrition Counselling Centre
- Swatch Bharat (100 hrs) Internship
- Enhancing Child Nutrition
- Environmental safety/ Green Campus safety
- Medicinal/Herbal Gardens in Villages

Research

Creation of Centres

- **ICMRS - Centres**
- Centre for Geriatric Research and rehabilitation
- Establishing advanced Research and Excellence Gastroenterology and Obesity -
- Centre for Machine Learning and Intelligence
- Enhancing Mental Health through Psychoogical Intervention in the NSS 20 Adopted Villages
- Application to set up Centre for Advanced and Research and Excellence (CARE) in Cancer

Other Centres of Excellence

- Ecofriendly Textiles
- Incubation Centre and Research for Enterpreneural Training
- Centre for Performing Arts
- Nutrition Counseling
- Kellyo India Scheme for Sports and Indoor Stadium
- Cyber Security

Proposed Activities

- Poverty Solutions
- Sustainable Green Campus
- Top up with solar Energy
- Setting up Modern Printing Press (Campus II)
- Centre for Comprehensive Data on Body Composition
- Cultural Study Centre
- Rural Tourism
- Obesity Clinic
- Centre for Nanotechnology

Perspective Plan (2018 -2023)

Academic

Aided Programmes

Existing

Existing

- Additional Faculty posts
- Additional support staff
- Equipment
- Additional Infrastructure
- Additional Books and Journals
- Centre for Gandhian Studies
- Centre for Women Studies
- Centre for Ambedkar Studies

Proposed in Perspective Plan

- MA Yoga & Naturopathy
- MA French
- M.P.Ed.
- BA Performing Arts
- BA Sanskrit or PG Diploma in Sanskrit
- M.Sc Food Safety and Quality Control
- MA Performing Arts
- BA Political Science

Self-financed Programmes

Proposed to convert as Aided

Existing SF

- M.Com
- M.Sc Biotechnology
- M.Sc IT
- M.Sc Applied Psychology
- BCA
- B.Com (CA)

Compulsory Curriculum Components

Existing

- Communication Skill
- Soft Skill

Avinashilingam Institute for Home Science and Higher Education for Women
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Re-accredited with 'A+' Grade by NAAC. Recognised by UGC Under Section 12 B
Coimbatore - 641 043, Tamil Nadu, India

CURIE (Consolidation of University Research for

Innovation and Excellence in Women Universities)

Proposal to Strengthen Artificial Intelligence (AI) Facility

1. **Name of University:**

   Avinashilingam Institute for Home Science and Higher Education for Women, Deemed University, Coimbatore - 43

2. **Name of Vice-Chancellor:**

   Dr. Premavathy Vijyayan

   e-mail & phone no: vc@avinuty.ac.in, 0422-2440241

3. **Name of CURIE Coordinator**:

   Dr. K.Udaya Chandrika

   e-mail & phone no: deanpscs@avinuty.ac.in, 0244-2440241

4. Infrastructure/Facilities (hardware/software/human resource) in AI and related areas at the University:

   Expertise

   Dr. P. Subashini, Professor, Department of Computer Science

   Dr. M.Krishnaveni, Assistant Professor, Department of Computer Science

   Dr. Judith Justin, Professor, Biomedical Instrumentation Engineering

   Dr. R.Vanithamani, Professor, Biomedical Instrumentation Engineering

   Area of Expertise

   Computational Intelligence, Machine Learning, Satellite Image Processing, Smart city Applications, Assistive Technology, Healthcare applications, Signal Processing, Medical Devices, Bio-signal and Image Processing in MATLAB and LabVIEW platform, IoT/IoMT, Robotics, Computer Aided Diagnosis of diseases using Soft Computing, Wearable Devices, and Smart Medical Textiles.

Hardware Resources-

Hardware Description	Quantity
High End Server R 630 DELL	2
Intel Xeon Server	1
Workstation HP Z420 Intel Xeon Quad core	1
Asus Intel core i7-5th generation	1
My Rio Bundle	1
NI Elvis-II	2
Bio instrumentation sensor kit	2
NI ELVIS Bench top workstation	5
NI-PCI-6251	10
SCB-68	5
Cisco catalyst 3850 24 port switch	2
Switch (Netgear, HCL, Cisco, D-Link)	9
Desktop	204
Desktop (Quad Core)	49
Thin Client	120
Laptop	33

Software Resources-

Software Description
Matlab 2010 version 40 users perpetual **Image processing, Neural networks-36 users**
MATLAB R2018a- Campus License
ORCAD 17.2 - 10 users
Multisim software - 10 users
NI academic site license fall 2017 - 50 users
Qualnet 5.0 -Network Simulator 20 users perpetual
Oracle 11g Database Standard Edition one processor License

Upcoming approved plan, if any: Nil

5. Whether University has any development plan in area of AI and related fields, if yes, please attach details:

Yes, as per Annexure – I & II

i. **Centre for Machine Learning and Intelligence (Annexure I)**

ii. **Centre for Artificial Intelligence and Robotics (Annexure II)**

6. Existing strength of University's Departments in AI and related areas (e.g. Engineering, Basic Science, Agriculture, Health, etc.) where the University intends to initiate or strengthen the AI field:

Sl. No.	Name of the Department	No. of Faculty	No. of Students enrolled
1.	Department of Computer Science	13	UG: 132
			PG: 24
			M.Phil: 4
			Ph.D: 37
2.	Department of Biomedical Engineering	10	UG: 133
			PG: 4
			Ph.D: 2
3.	Department of Education	14	UG: 186
			M.Ed.: 7
			Ph.D: 13
4.	Department of Special Education	10	UG: 175
			M.Ed.: 11
			Ph.D: 15

7. Objectives of proposed AI facility:

- To promote and cultivate the cutting-edge research at **UG/PG level students** based on the need of analytic capacity in order to detect inconsistencies and blank spots in AI theories and to nurture creativity to propose solutions in AI.

- To disseminate and catalyse the emergence of different domains of AI through seminars, conferences both national and international, workshops, summer schools, inhouse programme among **students/young AI research community.**

- To involve **active research scholars** in the domains of machine perception, sensor fusion, ambient intelligence, interactive systems, smart buildings, agent technologies, information processing, computation and web intelligence.

- To captivate the **international research forum** and form consortiums with the university peer group to coordinate the low-level mechanisms of AI to give rise to higher-level dynamics.

- To inculcate the research approaches that aim at a holistic and embedded view of intelligence from many different disciplines and viewpoints in **various needs of the society especially focusing on Assistive Technology, Educational Technology, Market Intelligence, Smart City projects, Healthcare, Agriculture, Transport and Legacy systems etc.**

8. Brief Plan to utilize proposed AI facility:

a. **Plan for short term/certificate programme**:

Several short term/certificate programmes on Machine Learning, Deep Learning, Internet of Things, Biped / Humanoid Robotics, Mobile Controlled, Gesture Controlled, Wifi controlled Robotics workshop, Android Apps Development, AI for Healthcare, AI for Business, AI for Agriculture etc. will be organized.

b. **Plan for UG/PG level**:

Courses on Machine Learning, Deep Learning, Internet of Things, Android programmimg, AI for Healthcare, AI for Business, AI for Agriculture etc. will be included in the UG/PG level at multi-disciplinary and inter-disciplinary level.

c. **Plan for initiating or strengthening AI related fields in Ph.D. and Research**:

- National and International level Conferences on Machine Learning, Deep Learning, Smart city, Health Care etc. will be organized.

- Collaborations at National and international level with industries and Institutions/Universities will be established.

- Experts from industries, Institutions/Universities will be invited to associate for knowledge dissemination, joint projects, joint research etc and they will be provided with travel support.

- Research proposals will be invited from Research Scholars and prospective proposals will be provided with a minimum fund including stipend, required hardware, software, travel grant to complete the research work. As outcome of the research, publications and

presentations will be done at National and International forums. Filing of patents will be encouraged.

d. **Students' activities in area of AI**:
   - Artificial Intelligence club will be formed
   - IEEE Student's Chapter will be established and will be associated with IEEE Computational Intelligence Society and IEEE Humanitarian Society
   - Project meets, Hackathons etc. will be conducted to promote and leverage projects culture among the students.

9. Expected Outcomes:

- Make women students to deliver their own incredible contributions in AI, Machine Learning, and Data Science.
- Provide tangible benefits, such as starting new careers or businesses and increase student's status from emerging economies or low socioeconomic backgrounds.
- Produce renowned women Academicians in AI based computer domains.
- AI contribution in essential human livelihood like education, health, eldercare, entertainment, and companionship.
- Bring brilliant AI researchers and young technologists driving the edge of innovations.

10. Estimated Budget:

Sl. No.	Budget Heads	1st Year	2nd Year	3rd Year	Amount in Rs.
1.	**Non-recurring Grant**				
	Hardware	1,50,00,000	50,00,000	50,00,000	2,50,00,000
2.	**Recurring Grant**				
	Software	1,00,00,000	1,00,00,000		2,00,00,000
3.	Travel- inward travel of AI experts and outward travel of staff	20,00,000	20,00,000	20,00,000	60,00,000
4.	Contingencies Patenting, Publication charges,	20,00,000	20,00,000	20,00,000	60,00,000
5.	Summer/Winter Schools	25,00,000	25,00,000	25,00,000	75,00,000
6.	AI Club activities, IEEE student chapter	5,00,000	5,00,000	5,00,000	15,00,000

	attached to IEEE Computational Intelligence Society, IEEE Humanitarian Society				
	Students project meet	50,000	50,000	50,000	1,50,000
	Seminars/Workshops	10,00,000	10,00,000	10,00,000	30,00,000
	Students/Scholars Projects	2,00,000	2,00,000	2,00,000	6,00,000
	Students/Scholars Publications	2,00,000	2,00,000	2,00,000	6,00,000
	Leveraging AI Research among Students/Research Scholars through Research projects	60,00,000	60,00,000	60,00,000	1,80,00,000
				SUB TOTAL	**8,83,50,000**
7.	**Institutional Overhead (15%)**				**1,32,52,500**
				TOTAL	**10,16,02,500**

Signature with seal of Head of the Institution

Avinashilingam Institute for Home Science and Higher Education for Women Cbe-43

Annexure – I

CENTRE FOR MACHINE LEARNING AND INTELLIGENCE

Department of Computer Science

Vision

The centre shall revolutionize the higher end experience for students in the process of learning AI by steering and involving them in various best practices and establish state of the art in the development and innovation of machine learning and computational intelligence algorithms.

Mission

Establishing centre to involve all fraternity that could serve them in the fields of Artificial Intelligence and Machine Learning. It shall be the hub for learners and innovators to involve in problem-solving projects and also the centre supports and organizes the activities in collaborations between AI research groups from different fields in the University, promoting the interdisciplinarity which is the key University research vision.

Objectives

- Conduct education through different knowledge sharing activities such as training, workshop, seminars and seasonal schools based on the level of participants
- Develop new human resources on AI and Data Analysis capable of deploying high level knowledge technologies to real world applications.
- Develop a base for Artificial Intelligence using the interdisciplinary interest of the university, through a network under the research centre.
- Develop AI technologies by employing the power of high-performance computing through theoretical research
- Impart familiarity on large scale machine learning and data analysis tools used in Artificial Intelligence based applications.
- Bring collaborative network for promoting and to share ideas with national research institutes and enterprises.

Expected Outcome

The outcomes will be the human resources at various levels such as women ML engineers, ML developers and programmers, active AI researchers, set of eminent scholarly forums

at various disciplinaries, active AI based clubs, national/international linkages, reputed publications, Joint work functionalities, AI based best practices at university level, research consortium and leveraging fields of financial services, Health Care, Government, Society, Marketing and sales and transportation.

Usage

Following are the standards that are proposed to realize the centre vision and to accomplish the planned mission:

- Promote open collaboration among departments and between campuses.
- Introduce innovative solutions to significant scientific or technological challenges.
- Create an environment to maintain ethical research practices and scientific processes.
- Provide guidance in areas of expertise to global science, international research communities and local society.
- Be results-oriented and provide solutions to emerging problems, ensuring alignment with society significances.
- Participate in Learning/Intelligence Challenge Competitions and initiate joint-work with machine learning start-ups.
- Conduct research of the highest quality and publish research results of indisputable value.

Job Opportunities

Few job opportunities under AI career path

1. Machine learning Engineer
2. Data Scientist
3. Business Intelligence Developer
4. Research Scientist
5. Big Data Engineer/Architect
6. Machine learning developer

Plan of action

Phase – I:

- Establishment of Machine Learning and Intelligence Lab – preparation of lab sites and establishment of required infrastructure.
- Offering short term, long term certificate programmes.
- Motivating students to participate in workshops, competitions etc.

Phase – II:

- Organizing seminars, workshops, summer/winter schools, conferences, Hackathons, clubs, project meets etc.
- Collaboration with industries and institutions.

- Motivating students / scholars to submit Research proposals.

Phase – III:

- Joint research work
- Outreach, Humanitarian projects
- Publications
- Patenting

Proposed research projects under centre for Machine learning and Intelligence

(i) Design and Development of Analytical tool for whole Exome Sequence Analysis of Respiratory Distress Syndrome (RDS) affected Neonates using GPU-CUDA

Respiratory distress syndrome (RDS) is a syndrome in new born and neonates continues to account for significant mortality and morbidity in the neonatal intensive care unit (NICU). Exome sequencing will help in understanding complex genetic disorders and disease and it is faster and less expensive than whole-genome sequencing, making it ideal for the study of variants that cause changes to protein-coding regions of genes. With the development of next-generation sequencing technologies and improvements in data analysis capabilities along with AI , it is now feasible to sequence and analyze whole genomes. This project **proposes to design and develop an analytical tool using high performance computing components such as GPU-CUDA** by delivering a menu driven Graphical User Interface (GUI) integrating created Exome Sequence database for data processing, integration, comparison, interpretation and visualization by scaling and developing algorithms towards data analysis through AI. **This project will be collaborated with Department of Biochemistry/Biotechnology/Bioinformatics which would establish a multidisciplinary team to centralize the diagnosing, managing and counselling of patients and at-risk family members with monogenetic genetic lung diseases.**

(ii) Robust biomedical sensor data acquisition for health care data analysis

Being able to comfortably monitor physiological information during daily life can reduce the costs associated with health care. Physiological measures such as cardiovascular and respiratory activity can be used for early detection and diagnosis of relevant risk factors of cardiovascular disease as well as for helping to monitor chronic conditions and therapeutic interventions. Continued developments of sensor technology including hardware

miniaturization and increased sensitivity have enabled the development of less intrusive methods to monitor physiological parameters during daily life. In this proposed project, possibility of using different sensor modalities of a head-mounted wearable device to extract physiological parameters of the wearer will be explored. It would be proposed to develop new real-time algorithms and demonstrate their effectiveness in a controlled laboratory setting for estimating heart and respiration rates. **This collaboration would be established between the proposed Centre for Machine Learning and Intelligence & Centre for Artificial Intelligence and Robotics which may lead to success of patenting the outcomes as a integration of hardware with newly developed algorithms.**

(iii) Developing a responsive intelligent e- learning system for education awareness in rural areas

Incorporation of Artificial Intelligence (AI) technique in learning has the potential to propel and accelerate opportunity to create innovative and adaptive learning features with personalized tools to improve learners' experience. The concept of AI techniques could be applied to various learning platforms which are described as follows: **Smart Learning Content** could be created from digitized guides of textbooks to customizable learning digital interfaces and introduced at all levels of graduate programmes. Smart learning content can also be used to design a digital curriculum and content across a variety of devices, including video, audio, and an online assistant. Machine learning algorithms will be applied to classify students based on learning style and recommend learning contents based on their interest. **Content analytics** refers to AI (specifically machine learning) platforms that optimize learning modules. Through AI, content taught to learners can be analyzed for maximum effect and optimized to take care of learners needs. Content analytics enables educators and content providers to manage their eLearning content and also gain important insights into learning progress and helps understanding through a powerful set of analytics. **Collaborative / Co-operative learning facilitation** method will be introduced to provide pathways to engage in group discussion through video conferencing. **Evaluation and Assessment** with machine learning method will be introduced to determine the satisfaction of students about e-learning contents and to get exposure to advanced technologies. **This project would be more benefitted to Department of Education to promote their extension activities which may be collaborated with the existing international partners at University of Hassan II, Casablanca, Morocco.**

(iv) Music based ICT tool development for Sensory and Motor Disabilities children

Every person has creative capabilities. Creative inclusive education has to recognize and support the development of the creativity of people who also have some specific learning disabilities (SLD), taking into account their distinctiveness as a result of certain developmental disorders. In this project, the possibilities will be analysed for offering creative and instructional support to students with dyslexia, to develop alternative and compensatory strategies, which lead to the realization of established goals in their daily and academic activities. The basis of a multisensory approach in the process of learning and training students with dyslexia has been an integral part of many programs for remedying and overcoming reading difficulties. A creative use of ICT tools in teaching will be organized to promote student participation and cooperative learning with and without SLD. **In collaboration with Department of Music and Department of Special Education a creative use of ICT can be developed as a smart teaching support for students with SLD.**

Beneficiary Departments –

1. Department of Education
2. Department of Special Education
3. Department of Music
4. Department of Business Administration
5. Department of Information Technology
6. Department of Biochemistry/Biotechnology/Bioinformatics

Annexure - II

CENTRE FOR ARTIFICIAL INTELLIGENCE AND ROBOTICS

Department of Biomedical Instrumentation Engineering

Vision

The centre shall provide opportunities and expertise for developing knowledge in AI and Robotics, to be implemented in early detection, diagnostics, and decision making in healthcare services. It also offers a platform for research through design and development of innovative medical devices and robotics.

Mission

- Embracing the full potential of AI in healthcare by imparting skill training to mimic human cognitive functions in machines.
- Imparting technologies of health outcome prediction systems, early detection and diagnosis of diseases and decision making in solving complex problems similar to human logic and reasoning.
- Designing innovative medical devices and robotics along with Internet of Medical Things (IoMT) so that scarcity in expertise and healthcare problems are augmented.

Objectives

1. Provide a conducive environment for acquiring expertise in AI and Robotics
2. Produce skilled personnel to address mechanisms involving AI
3. Integrate domains related to AI and bring about a paradigm shift in healthcare

Expected Outcome

- Major benefits in the field of health care, automated driving and visual tracking systems

Usage

It is proposed to accomplish the vision of the centre by

1. Conducting Faculty Development Programs(FDPs), Student workshops, skill training and internships in domain related industries
2. Participating and presenting papers in seminars and conferences
3. Organising conferences to bring together AI research groups to share knowledge
4. Implementing novel ideas in the field of AI and robotics through knowledge gained

5. Publishing research findings in reputed journals and by patenting the models developed

Job Opportunities

1. Artificial Intelligence Technology Specialist
2. Research Scientist - Automation, Machine Learning
3. Robotic Process Automation Solutions Developer
4. Artificial Intelligence Consultant
5. Robotics Enginner
6. Software Engineer- IoMT/AI
7. Computer Vision Engineer

Plan of action

Phase - I

- Establishment of AI and Robotics Laboratory
- Conducting skill training programs

Phase – II

- Organizing Faculty Development Programs (FDPs), Student workshops, skill training and Industry institute interaction
- Organizing conferences on the topics related to AI and Robotics
- Motivating the students to implement novel ideas in the field of AI and robotics

Phase - III

- Projects on societal concern
- Publication and IPR
- Joint research work
- Wearable sensors and IoT

Proposed Research projects

(i) Design and development Assistive Devices - Intelligent wheel chairs

This project is an innovation in the field of rehabilitation as it has precise control and accurate movements through joystick and voice control mechanisms to control the movement of wheelchair. Voice controlled movement will be extremely helpful to someone who might lack the physical ability to move both their legs. Since these

people would be confined to a wheel chair, this mechanism is an alternative to the joystick. The patients with Paraplegia find it very difficult to sit continuously in the same position, may develop back pain and muscle cramps. To help them, wheelchair can also be converted to a bed by stretching it, and helps the paraplegic patient to lie down without an auxiliary support. The wheel chair has medicine cabinet with a voice enabled reminder system. It can also be tracked using a mobile application.

(ii) Safety suit for soldiers using wearable sensors

In current scenario, enemy warfare is an important factor for any nation's security. The nation's security mainly depends on Army, Navy and Air Force. There are many concerns regarding the safety of soldiers. The proposed system "**Safety suit for soldiers using wearable sensors**" is IoT based health monitoring and tracking system of the soldiers. This system is fixed on the soldiers' suit to track their health status and current location using Global Positioning System (GPS). This information will be transmitted to the base system through IoT. Health monitoring system shall consist of tiny wearable biosensors and transmission modules. Text-to-speech application is included to notify basic first aid to the soldier. In case of emergencies, a panic buzzer is available which alerts the base station. Physiological values beyond the normal values initiate immediate measures. Hence, with the use of this proposed life guarding system, it is possible to implement a low cost mechanism to protect the valuable human life in the battlefield.

(iii) Remotely controlled material handling robots thereby reducing the risk for human lives

Robotics is creating revolution today. It plays a very important role in many applications including office, military tasks, hospital operations, hazardous environment, infection prone areas and agriculture. The robotic arm even plays an important role in acid fire attacks and prevents the people from getting involved in rescue operation. EMG signal is acquired from the human arm through surface electrodes and speech signal is acquired through Bluetooth module. The acquired signals are converted to digital using a micro controller and sent to PC. The PC is loaded with LabVIEW software. The signals are transmitted to another PC via intranet or internet. The remote front panel in LabVIEW enables the user to control the robotic arm from a distant place. The robotic arm performs six operations Up, Down, Right,

Left, Pick, and Drop similar to that of the human arm. It can also be extended to various other operations with additional voice commands. As this robotic arm is controlled from remote locations, it can be used in hazardous environment thereby reducing the risk of human lives.

Beneficiary Departments –

1.Department of Computer Science and Engineering

2.Department of Special Education

3.Department of Electronics and Communication Engineering

4. Department of Printing Technology

Director	***Co-Ordinator***
Dr. K.Udaya Chandrika Dean School of Physical Sciences and Computational Sciences	Dr. P.Subashini Professor Department of Computer Science

No. DST/CURIE-AI/2019
Government of India
Ministry of Science & Technology
Department of Science & Technology

Technology Bhavan
New Mehrauli Road
New Delhi-110 016
Dated-29.03.2019

ORDER

Sub: Financial approval of the project under Consolidation of University Research for Innovation and Excellence in Women Universities (CURIE) to support for Artificial Intelligence (AI) Lab in CURIE Beneficiary Women Universities.

Sanction of the President is hereby accorded to the payment of **Rs. 210 lakh** (Rupees Two Hundred Ten Lac only) as the Grant for creation of capital assets in the above mentioned project. The details of the equipment to be procured are given below:

Sl. No.	Heads	Budget for one Women University (in lakh)	Budget for 6 Women University (in lakh)
A.			
	Computer Workstations/ Servers (4), Compute Nodes (20), LED Display, Projector, Biometric Access and Printer	35.00	210.00
	TOTAL	35.00	210.00

2. The grantee organization will maintain separate audited account for the project and the entire amount of grant will be kept in an interest bearing bank account. The interest earned / accrued should be reported to DST (financial year wise) while submitting the Statement of Expenditure/Utilization Certificate. The interest thus earned will be treated as a credit to the grantee organization, which will be adjusted towards future release of grant.

3. This sanction is subject to the condition that the grantee organization will furnish to the Department of Science & technology, financial year wise Utilization Certificate (UC) in the proforma prescribed as per GFR 2017 and audited statement of expenditure (SE) along with up to date progress report at the end of each financial year duly reflecting the interest earned / accrued on the grants received under the project. This is also subject to the condition of submission of the final statement of expenditure, utilization certificate and project completion report within one year from the scheduled date of completion of the project.

4 The grantee organization will have to enter & upload the Utilization Certificate in the PFMS portal besides sending it in physical form to this Division. The subsequent/final instalment will be released only after confirmation of the acceptance of the UC by the Division and entry of previous Utilization Certificate in the PFMS.

5. If the grant has been released under capital head through separate sanction order under the same project for purchase of equipment(s), separate SE/UC has to be furnished for the released Capital head grant.

6. The account of the grantee organization shall be open to inspection by the sanctioning authority and audit (both by C& AG of India and Internal Audit by the Principal Accounts Office of the DST), whenever the organization is called upon to do so, as laid down under Rule 236(1) of General Financial Rules 2017.

7. The grant-in-aid being released is subject to the condition that.

(a) A transparent procurement procedure in line with the Provisions of General Financial Rules 2017 will be followed by the Institute/ Organization under the appropriate rules of the grantee organization while procuring capital assets sanctioned for the above mentioned project and a certificate to this effect will be submitted by the Grantee organization immediately on receipt of the grant.

(b) While submitting Utilization Certificate/Statement of Expenditure, the organization has to ensure submission of supporting documentary evidences with regard to purchase of equipment/capital assets as per the provisions of GFR 2017. Subsequent release of grant under the project shall be considered only on receipt of the said document.

Contd..p/- 2

Singh

8. DST reserves sole rights on the assets created out of grants. Assets acquired wholly or substantially out of government grants (except those declared as obsolete and unserviceable or condemned in accordance with the procedure laid down in GFR 2017), shall not be disposed of without obtaining the prior approval of DST.

9. The Grantee Institute (GI) will maintain separate audited as per GFR 2017 Rule 230 (8) account for the project and the entire amount of grant will be kept in an interest bearing bank account. For Grants released during F/Y 2017-2018 and onwards interest and other earnings, against released Grant shall be remitted to Consolidated Fund of India, immediately after finalization of accounts, as it shall not be adjusted towards future release of Grant. A certificate to this effect shall have to be submitted along with statement of expenditure/utilization certificate for considering subsequent release of grant/closure of project accounts. GI should also follow Rule 230 (17) of GFR 2017 concerning to reservation of SC/ST/OBC, if application.

10. Failure to comply with the terms and conditions of the Bond will entail full refund with interest in terms of Rule 231 (2) of GFR 2017.

11. The expenditure involved is debatable to: Demand No.84 Department of Science & Technology for the year 2018-2019.

3425	Other Scientific Research (Major Head)
60	Others (Sub-Major Head)
60.200	**Assistance to other Scientific Bodies (Minor Head)**
68	Science and Technology Institutional and Human Capacity Building (Sup Head)
01	Disha Programme for Women in Science
68.00.35	Grants-in-aid for creation of capital assets for the year 2018-2019 **(Voted)**

(Previous: Disha Programme for Women in Science 3425.60.200.55.01.31)

12. The amount of **Rs 210 lakh** (Rupees Two Hundred Ten Lac only) for 6 women universities **(Rs 35 lakh each)** as **non-recurring grant** will be Disbursed to the following:

i) **The Registrar, Avinashilingam Institute for Home Science and Higher Education for Women, Deemed University, Coimbatore-43** by means of electronic transfer as per the details given below:

Institute Name	: Avinashilingam Institute for Home Science and Higher Education for Women Deemed University, Coimbtore-43.
Bank name	: Indian Bank
Account No.	: 917248759
Branch	: Coimbtore
IFSC Code	: IDIB000A005

ii) **The Registrar, Banasthali Vidyapith, Banasthali-304022, Rajasthan** by means of electronic transfer as per the details given below:

Institute Name	: Banasthali Vidyapith
Bank name	: State Bank of India
Account No.	: 32132800012
Branch	: Banasthali Tonk
IFSC Code	: SBIN0015363

iii) **The Registrar, Indira Gandhi Delhi Technical University for Women** by means of electronic transfer as per the details given below:

Institute Name	: Indira Gandhi Delhi Technical University for Women
Bank name	: Punjab & Sind Bank
Account No.	: 09001000018950
Branch	: IGDTUW Campus
IFSC Code	: PSIB0001098

iv) **The Registrar, Karnataka State Women's University, Bijapur** by means of electronic transfer as per the details given below:

Institute Name	: Karnataka State Women's University, Bijapur
Bank name	: Syndicate Bank
Account No.	: 08542200001390
Branch	: Jnana Shakti Campus
IFSC Code	: SYNB0000863

Contd..p/- 3

Singh

v) **The Registrar, Mother Teresa Women's University** by means of electronic transfer as per the details given below:

Institute Name : Mother Teresa Women's University
Bank name : Canara Bank
Account No. : 0945101026802
Branch : Annasalai, Kodaikanal
IFSC Code : CNRB0000945

vi) **The Registrar, Sri Padmavati Mahila Visvavidyalayam, Tirupati** by means of electronic transfer as per the details given below:

Institute Name : Sri Padmavati Mahila Visvavidyalayam, Tirupati
Bank name : Andhra Bank
Account No. : 174910100014286
Branch : Padmavati Nagar
IFSC Code : ANDB0001749

13. As per Rule 211(1) of GFRs, the accounts of the project shall be open to inspection by the sanctioning authority/audit whenever the institute is called upon to do so.

14. There is no due pending UC from the Institute for this scheme/project as per the details in the PFMS.

15. Principal Investigator (PI) is directed to acknowledge "research grant" in all publications emerging out of this particular project. For example, "Authors acknowledge Department of Science and Technology, Government of India for financial support vide Reference No. ..... under Consolidation of University Research for Innovation and Excellence in Women Universities (CURIE) to carry out this work.

16. This sanction has been entered Sl. No. **730** in the Register of Grants (2018-19).

17. The Sanction has been issued under the powers delegated to the Ministries and with the concurrence of IF Division of Department of Science & Technology vide their Concurrence Diary Number C/**6484**/IFD/2018-19 dated 29.03.2019.

(Vandana Singh)
Scientist-E

Copy forwarded for information and necessary action to:-

1. The Director of Audit (CW & M-II), AGCR Building, IP Estate, New Delhi-110 002.
2. Copy with two spare copies of the sanction to the Drawing & Disbursing Officer, DST, Cash Section.
3. Dr. Premavathy Vijyayan, Vice Chancellor, Avinashilingam Institute for Home Science and Higher Education for Women, Deemed University, Coimbatore - 43.
4. The Registrar, Avinashilingam Institute for Home Science and Higher Education for Women, Deemed University, Coimbatore - 43.
5. Prof. Aditya Shastri, Vice Chancellor, Banasthali Vidyapith, Banasthali-304022, Rajasthan
6. The Registrar, Banasthali Vidyapith, Banasthali-304022, Rajasthan.
7. Dr Amita Dev, Pro Vice Chancellor, Indira Gandhi Delhi Technical University for Women, New Delhi.
8. The Registrar, Indira Gandhi Delhi Technical University for Women, New Delhi.
9. Prof. Sabiha, Karnataka State Women's University, Bijapur.
10. The Registrar, Karnataka State Women's University, Bijapur.
11. The Registrar, Mother Teresa Women's University, Kodaikanal.
12. Dr. M. Pushpa Rani, Coordinator,Mother Teresa Women's University, Kodaikanal.
13. Prof. V. Uma, Vice Chancellor (I/C), Sri Padmavati Mahila Visvavidyalayam (Women's University), Tirupati.
14. The Registrar, Sri Padmavati Mahila Visvavidyalayam (Women's University), Tirupati.
15. Pay & Accounts Officer, DST, New Delhi
16. Accounts Section, DST, New Delhi
17. Head, KIRAN Division
18. Sanction Folder.
19. COA, DST, New Delhi
20. IFD, DST, New Delhi
21. KIRAN Secretariat.

(Vandana Singh)
Scientist-E

NO. DST/CURIE-AI/2019(G)

Government of India
Ministry of Science & Technology
Department of Science & Technology

Technology Bhavan
New Mehrauli Road
New Delhi-110 01
Dated: 03.06.2019

ORDER

Sub: Financial approval of the project under Consolidation of University Research for Innovation and Excellence in Women Universities (CURIE) to support for Artificial Intelligence (AI) Lab in CURIE Beneficiary Women Universities.

In continuation of the Sanction Order No. **DST/CURIE-AI/2019(C)** dated 29.03.2019 Sanction of the President is hereby accorded to the payment of a total **Rs 35 lakh** as **Recurring Grant** for one year in **Phase-I** for one Women University and **Rs 210 lakh** for 6 universities. The items of expenditure for which the total allocation of **Rs 35 lakh** has been approved for one year are given below:

S.No	Heads	Budget for one Women University (in lakh)	Budget for 6 Women University (in lakh)
A	**Non-Recurring (Capital items)**		
	Computer Workstations/ Servers, Compute Nodes, LED Display, Projector, Biometric Access and Printer	**35.00**	**210.00**
B	**Recurring (General)**		
	Software License	**5.00**	**30.00**
	Summer/Winter School (Training Activities including Workshops)	**10.00**	**60.00**
	Travel (including AI Experts' visits & faculty travel to different institutions)	**7.00**	**42.00**
	DST CURIE-AI Students Club (for student activities)	**5.00**	**30.00**
	Contingency	**3.00**	**18.00**
C	**Overhead**	**5.00**	**30.00**
D	**Sub Total (B+C)**	**35.00**	**210.00**
E	**Grant Total (A+D)**	**70.00**	**420.00**

2. Overhead expenses are meant for the host institute towards the cost for providing infrastructure Facilities and benefits to the staff engaged in the project, etc.

3. Sanction of the grant is subject to the conditions as detailed in website www.dst.gov.in.

4. Sanction of the President is accorded to the payment of **Rs 35 lakh** (Rupees Thirty Five Lac only) under 'Grant-in-aid General' to each of the **CURIE Beneficiary Women University** being first installment of grant for the year 2019-20 for implementation of the said project.

5. This sanction is subject to the condition that the grantee organization will furnish to the Department of Science & technology, financial year wise Utilization Certificate (UC) in the proforma prescribed as per GFR 2017 and audited statement of expenditure (SE) along with up to date progress report at the end of each financial year duly reflecting the interest earned / accrued on the grants received under the project. This is also subject to the condition of submission of the final statement of expenditure, utilization certificate and project completion report within one year from the scheduled date of completion of the project.

Contd..p/- 2

Singh

6. The grantee organization will have to enter & upload the Utilization Certificate in the PFMS portal besides sending it in physical form to this Division. The subsequent/final instalment will be released only after confirmation of the acceptance of the UC by the Division and entry of previous Utilization Certificate in the PFMS.

7. If the grant has been released under capital head through separate sanction order under the same project for purchase of equipment(s), separate SE/UC has to be furnished for the released Capital head grant.

8. The grant-in-aid being released is subject to the condition that.

(a) A transparent procurement procedure in line with the Provisions of General Financial Rules 2017 will be followed by the Institute/ Organization under the appropriate rules of the grantee organization while procuring capital assets sanctioned for the above mentioned project and a certificate to this effect will be submitted by the Grantee organization immediately on receipt of the grant.

(b) While submitting Utilization Certificate/Statement of Expenditure, the organization has to ensure submission of supporting documentary evidences with regard to purchase of equipment/capital assets as per the provisions of GFR 2017. Subsequent release of grant under the project shall be considered only on receipt of the said documents.

9. The grantee organization will have to enter & upload the Utilization Certificate in the PFMS portal besides sending it in physical form to this Division. The subsequent/final instalment will be released only after confirmation of the acceptance of the UC by the Division and entry of previous Utilization Certificate in the PFMS.

10. If the grant has been released under capital head through separate sanction order under the same project for purchase of equipment(s), separate SE/UC has to be furnished for the released Capital head grant.

11. The grant-in-aid being released is subject to the condition that.

(a) A transparent procurement procedure in line with the Provisions of General Financial Rules 2017 will be followed by the Institute/ Organization under the appropriate rules of the grantee organization while procuring capital assets sanctioned for the above mentioned project and a certificate to this effect will be submitted by the Grantee organization immediately on receipt of the grant.

(b) While submitting Utilization Certificate/Statement of Expenditure, the organization has to ensure submission of supporting documentary evidences with regard to purchase of equipment/capital assets as per the provisions of GFR 2017. Subsequent release of grant under the project shall be considered only on receipt of the said documents.

12. The account of the grantee organization shall be open to inspection by the sanctioning authority and audit (both by C& AG of India and Internal Audit by the Principal Accounts Office of the DST), whenever the organization is called upon to do so, as laid down under Rule 236(1) of General Financial Rules 2017.

13. Due acknowledgement of technical support / financial assistance resulting from this project grant should mandatorily be highlighted by the grantee organization in bold letters in all publications / media releases as well as in the opening paragraphs of their Annual Reports during and after the completion of the project.

14. Failure to comply with the terms and conditions of the Bond will entail full refund with interest in terms of Rule 231 (2) of GFR 2017.

15. The expenditure involved is debatable to: Demand No.84 Department of Science & Technology for the year 2019-2020.

3425	Other Scientific Research (Major Head)
60	Others (Sub-Major Head)
60.200	**Assistance to other Scientific Bodies (Minor Head)**
68	Science and Technology Institutional and Human Capacity Building (Sup Head)
01	Disha Programme for Women in Science
68.01.31	**Grants-in-aid General** for the year 2019-20 **(Voted)**

(Previous: Disha Programme for Women in Science 3425.60.200.55.01.31**)**

16. The institute will furnish to the DST, Utilization certificate and an audited statement of accounts pertaining to the grant immediately after the end of the each financial year. As this is the first grant being released for the project, no previous U/C is required.

Contd..p/- 3

Singh

17. The Institute will maintain separate audited accounts for the project; If it is found expedient to keep a part or whole of the grant in a bank account earning interest, the interest earned should be reported to DST. The interest thus earned will be treated as a credit to the institute to be adjusted towards further installment of the grant.

18. The amount of **Rs 210 lakh** (Rupees Two Hundred Ten Lac only) for 6 women universities **(Rs 35 lakh each)** as recurring grant will be Disbursed to the following:

i) **The Registrar, Avinashilingam Institute for Home Science and Higher Education for Women, Deemed University, Coimbatore-43** by means of electronic transfer as per the details given below:

Institute Name : Avinashilingam Institute for Home Science and Higher Education for Women Deemed University, Coimbtore-43.
Bank name : Indian Bank
Account No. : 917248759
Branch : Coimbtore
IFSC Code : IDIB000A005

ii) **The Registrar, Banasthali Vidyapith, Banasthali-304022, Rajasthan** by means of electronic transfer as per the details given below:

Institute Name : Banasthali Vidyapith
Bank name : State Bank of India
Account No. : 32132800012
Branch : Banasthali Tonk
IFSC Code : SBIN0015363

iii) **The Registrar, Indira Gandhi Delhi Technical University for Women** by means of electronic transfer as per the details given below:

Institute Name : Indira Gandhi Delhi Technical University for Women
Bank name : Punjab & Sind Bank
Account No. : 09001000018950
Branch : IGDTUW Campus
IFSC Code : PSIB0001098

iv) **The Registrar, Karnataka State Women's University, Bijapur** by means of electronic transfer as per the details given below:

Institute Name : Karnataka State Women's University, Bijapur
Bank name : Syndicate Bank
Account No. : 08542200001390
Branch : Jnana Shakti Campus
IFSC Code : SYNB0000863

v) **The Registrar, Mother Teresa Women's University** by means of electronic transfer as per the details given below:

Institute Name : Mother Teresa Women's University
Bank name : Canara Bank
Account No. : 0945101026802
Branch : Annasalai, Kodaikanal
IFSC Code : CNRB0000945

vi) **The Registrar, Sri Padmavati Mahila Visvavidyalayam, Tirupati** by means of electronic transfer as per the details given below:

Institute Name : Sri Padmavati Mahila Visvavidyalayam, Tirupati
Bank name : Andhra Bank
Account No. : 174910100014286
Branch : Padmavati Nagar
IFSC Code : ANDB0001749

Contd..p/- 4

19. As per Rule 211(1) of GFRs, the accounts of the project shall be open to inspection by the sanctioning authority/audit whenever the institute is called upon to do so.

20. There is no due pending UC from the Institute for this scheme/project as per the details in the PFMS.

21. Principal Investigator (PI) is directed to acknowledge "research grant" in all publications emerging out of this particular project. For example, "Authors acknowledge Department of Science and Technology, Government of India for financial support vide Reference No. ..... under Consolidation of University Research for Innovation and Excellence in Women Universities (CURIE) to carry out this work.

22. This sanction has been entered Sl. No. **66** in the Register of Grants (2019-20).

23. The Sanction has been issued under the powers delegated to the Ministries and with the concurrence of IF Division of Department of Science & Technology vide their Concurrence Diary Number C/**799**/IFD/2019-20 dated 31.05.2019.

(VandanaSingh)
Scientist-E

Copy forwarded for information and necessary action to:-

1. The Director of Audit (CW & M-II), AGCR Building, IP Estate, New Delhi-110 002.
2. Copy with two spare copies of the sanction to the Drawing & Disbursing Officer, DST, Cash Section.
3. The Registrar, Avinashilingam Institute for Home Science and Higher Education for Women, Deemed University, Coimbatore - 43.
4. Dr. Premavathy Vijyayan, Vice Chancellor, Avinashilingam Institute for Home Science and Higher Education for Women, Deemed University, Coimbatore - 43.
5. The Registrar, Banasthali University, PO- Bansthali Vidyapith, Banasthali-304022, Rajasthan.
6. Prof. Aditya Shastri, Banasthali University, PO- Bansthali Vidyapith, Banasthali-304022, Rajasthan.
7. The Registrar, Indira Gandhi Delhi Technical University for Women, New Delhi.
8. Dr Amita Dev, Indira Gandhi Delhi Technical University for Women, New Delhi.
9. The Registrar, Karnataka State Akkamhadevi Women's University, Vijayapura.
10. Prof. Sabiha, Karnataka State Akkamhadevi Women's University, Vijayapura.
11. The Registrar, Mother Teresa Women's University, Kodaikanal.
12. Dr.M.Pushpa Rani, Mother Teresa Women's University, Kodaikanal.
13. The Registrar, Sri Padmavati Mahila Visvavidyalayam (Women's University), Tirupati.
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18. Sanction Folder.
19. COA, DST, New Delhi
20. IFD, DST, New Delhi
21. KIRAN Secretariat.

(VandanaSingh)
Scientist-E

Avinashilingam Institute for Home Science and Higher Education for Women
(Deemed to be University under Category **A** by MHRD, Estd. u/s 3 of UGC Act 1956)
Re-accredited with **A+** Grade by NAAC. Recognised by UGC Under Section 12 B
Coimbatore - 641 043, Tamil Nadu, India

DST –CURIE-AI Facility

Sponsored by

सत्यमेव जयते
Department of Science and Technology
Ministry of Science and Technology
Government of India

Project Completion Report

April 2019 – March 2020

Submitted by

Avinashilingam Artificial Intelligence Facility

DST-CURIE-AI/2019(c) dated 29.03.2019

Preamble

Avinashilingam Institute for Home Science and Higher Education for women, Coimbatore was established as an aided college by the great patriot and educationist **Padma Bhushan Dr.T.S.Avinashilingam** under the auspices of the Avinashilingam Education Trust in1957 with 45 women students. **Dr.Rajammal P.Devadas,** doyen of Home Science nurtured the institution of what it is today.

The saga of excellence and legacy created by the visionaries have been carefully nurtured and carried forward by a team of devoted functionaries. Presently, **Dr.T.S.K.Meenakshisundaram,** Managing Trustee, Sri Avinashilingam Education Trust, **Dr.P.R.Krishnakumar,** Chancellor, **Dr.Premavathy Vijayan,** Vice Chancellor and **Dr.S.Kowsalya,** Registrar are carrying forward the transformative vision to place the institution as its zenith.

It is now one of the largest institutions in the country to impart quality education for women at all levels. the institute follows the educational ideals of Sri Ramakrishna, Holy mother Sri Saradamani Devi, Swami Vivekananda and Mahatma Gandhi and upholds a life of purity, discipline and service.

From time immemorial, the institutional activities have been focusing on providing education with

- Academic Excellence
- Vitality of Culture and Values
- Social Relevance

The Institute's educational process is to produce respectful, peaceful, honest and responsible people, through an ethos, a culture, an environment within the institute, in which the aforementioned values are the hallmark of how the Institute organises itself into.

DST-CURIE-AI PHASE – I	
Completed Tasks	I. Establishment of **Centre for Machine Learning and Intelligence** (Campus – I) II. Establishment of **Centre for Artificial Intelligence and Robotics** (Campus – II) III. **Avinashilingam Artificial Intelligence (A2I) Club** IV. Short term **Workshops and Trainings** V. **Procurement** of Equipment VI. **Student's AI projects** VII. **Mentoring** of Student's AI projects VIII. **Academic programs** a) **Post Graduate Diploma** in Artificial Intelligence b) **Value added course** on 'Digital Intelligence' c) **Professional Certificate Course** on Artificial Intelligence in Education
Proposed Task but couldn't complete due to COVID	Artificial Intelligence **Exhibition** - March 2020

Fund Utilization	
Non - Recurring	Sanctioned Amount: 35,00,000
	Utilized: 34,67,685
Recurring	Sanctioned Amount: 35,00,000
	Utilized: 23,14,278

I.ESTABLISHMENT OF CENTRE FOR MACHINE LEARNING AND INTELLIGENCE (CAMPUS – I)

About Us

The Centre for machine learning and intelligence is a centre formed for students, consisting of both undergraduate and postgraduate who are interested in AI and seek a place to talk about it. Our goal is to form a community of interested students who share knowledge, passion, and skills. The centre focuses around Artificial Intelligence, Machine Learning and Deep Learning and its application in the domain of Health care, Agriculture, Smart cities, Education, Transport etc.

Vision

- To realize the potential of AI field.
- To be an international leader in AI and machine learning education.
- To become the most noted for the significant contributions in the field globally.

Mission

- To provide students with the knowledge, experience and skills to become the leader in machine learning and intelligence research and education.
- To have a significant impact on the local economy through facilitation and set up.

Objectives

- To provide a platform to exchange and enhance Knowledge in AI.
- To provide technical training to students in the focus areas of AI.
- Motivate and guide students to participate in competitions
- To take up industry defined problems and provide solutions
- To spread awareness among students about AI technology for nation building

Site preparation for Centre for Machine Learning and Intelligence (Campus – I)

- **Artificial Intelligence Lab**

  A complete laboratory with presentation hall, workspace for students to work on AI projects is established. This facility will be utilized by all the Departments to host various trainings, developing projects, incubating students towards AI and Machine

- **Artificial Intelligence Library**

  A complete library with the books purchased on Artificial Intelligence, Machine Learning, Internet of Things (IoT) has been setup for all the students from various Schools.

II. ESTABLISHMENT OF CENTRE FOR ARTIFICIAL INTELLIGENCE AND ROBOTICS (CAMPUS – II)

Vision

To achieve excellence in imparting education, developing technical skills among women and be recognized as a research-driven department in the field of Artificial Intelligence and Robotics.

Mission

- To provide educational opportunities to the rural women and prepare them for a productive career in the discipline of Artificial Intelligence and Robotics.
- To be the driving force in creating engineering knowledge and novel machine learning technology that improves human condition
- To address the major concerns of our society through quality education and new teaching and learning methodologies
- To prepare the students to be the next generation leaders and entrepreneurs to advance the field of Artificial Intelligence and Robotics with societal concern

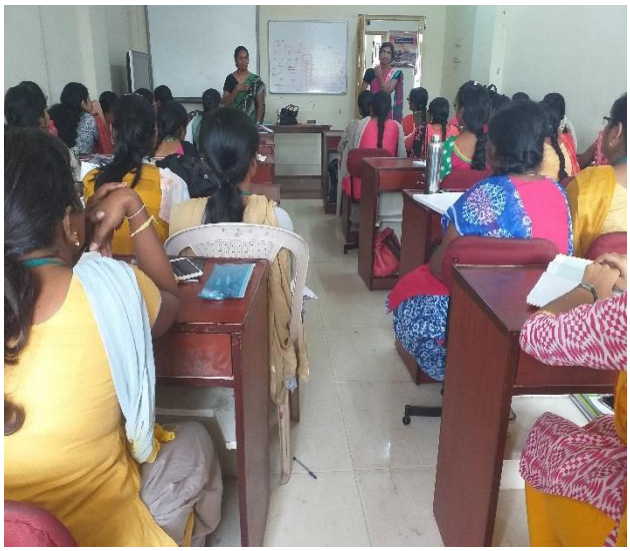
Objectives

- ✓ To spread the knowledge about AI and Robotics among the students and the common people
- ✓ To bring out the ideas of the students by conducting various activities.
- ✓ To ignite the students interest in various branches of AI

III. AVINASHILINGAM ARTIFICIAL INTELLIGENCE (A2I) CLUB

Orientation on AI for University students

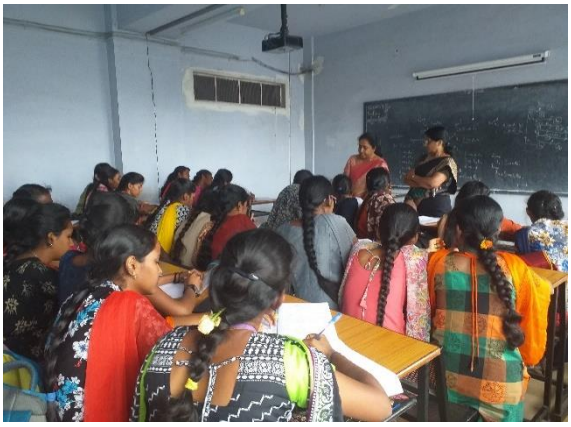
Orientation on AI to all students - Dr.P.Subashini Professor, Department of Computer Science



Department wise Orientation on AI

STUDENTS OFFICE BEARERS SELECTION MEETING (BOTH CAMPUS I AND II)

Students representatives were selected based on interest on AI and leadership qualities



Selection of Students representatives for A2I Club

STUDENTS CLUB INAUGURATION -A2I CLUB

DST-CURIE-AI Facility Sponsored "Avinashilingam Artificial Intelligence (A2I) Club"

The Centre for Machine Learning and Intelligenceorganized the inauguration of "Avinashilingam Artificial Intelligence club" on 25th September 2019 as part of the activity of DST- CURIE- AI Facility. The club inauguration was sponsored by the Department of Science and Technology (DST) under CURIE.

At A2I Club

Mission of the club is to encourage, learning, and enthusiasm in the field of artificial intelligence. The club provides a friendly and supportive forum bringing together like-minded students and Faculty discussing the risks and rewards of AI, the ethics of AI, and its role in our future society.

The club will arrange AI experts and researchers to present their findings and thoughts to educate students, to build and assist others with projects related to artificial intelligence, and to connect students with opportunities to do research in this field.

Participants

A total of 600 club members from various Departments of the institution attended the inauguration function from Campus I and II. More than 50 faculty members took part in the club inauguration.

Inaugural event

Session 1:

The event started with the introduction of office bearers [campus I and II], followed by release of A2I club LOGO and newsletters on AI. **Dr.Premavathy Vijayan,** Vice Chancellor presided over the function. **Dr.S.Kowsalya**, Registrar greeted the gathering. The Inaugural talk on "AI –A Life changing technology" was given by **Mr.Sathish Kumar**, Founder & CEO, MINDNOTIX Technologies, Coimbatore.

Session 2:

A special Lecture was delivered on "Humanoids" by Dr. Judith Justin, Professor & Head Department of Biomedical Instrumentation Engineering and ,"AI in education" by Dr.C.Karthik Deepa, Assistant Professor, Department of Education.

Session 3:

Surprise events were conducted such as Logo Creation, Poster Exhibition and slogan writing by A2I club members.

Session 4:

Mr.Karthik , Enthu Technology demonstrated the component of LoRa I/O Controller. The Dragino LT series I/O Modules are Long Range Lora I/O Controller. It contains different I/O Interfaces such as analog current Input, analog voltage input, relay output, digital input.

LoRa I/O Controller

A demonstration was shown by Mr.Karthik to develop an AI based IOT system to smart agriculture.

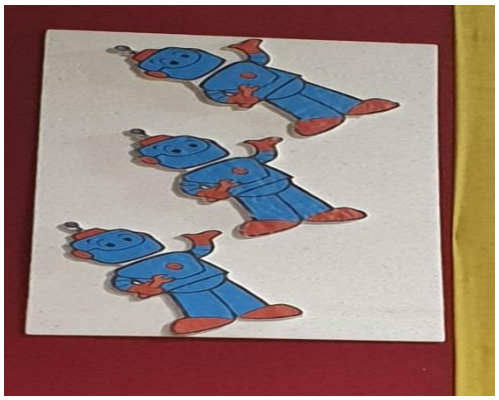
Session 5:

Dr.K.UdayaChandrika, Director DST-CURIE-AI presided the vote of thanks and distributed the prizes for winners of surprise events. Certificates issued to all the participants and prize winners.

Inauguration of A2I club – lighting by Vice Chancellor, Registrar, Director, Coordinator

Lighting by Mr.Sathish, Monidnotix Solutions, Coimbatore, Chief Guest

Release of LOGO for A2I Club by Office Bearers



Handmade Exhibits by the students on AI

Exhibits of Poster competition on AI for the students

A2I Club members with LOGO and other exhibits on AI

Newsletters on AI – by the A2I Club members

Issue 1 - September 2019

Issue 2 - February 2020

Issue 3 - July 2020

KALAIVIZHA CLUB ACTIVITY 2019 ON THE TOPIC "SAVE ENVIRONMENT"

Working models demonstration

1) Voice controlled home automation
2) Smart irrigation system using IOT
3) Newsletter

1) Voice controlled home automation

With the help of Bluetooth module and voice controlled Bluetooth application its control the home appliances with a certain range of distance. The controlled LED by giving command "all led Turn On".

Applications

- Useful for differently abled to control home appliances
- Elderly people to control home appliances

2) Smart irrigation using IOT

The agriculture is backbone of our country so we have developed a system with the objective of automatic irrigation system. To do irrigate the firm and to analyses soil moisture level with sensors, In wetland condition to control operation on irrigation water, and when the water level overflows the threshold it automatically stops.

Applications

- It is used for energy consumption.
- Alongwith precised farming technique can be leverage with improving farm productivity
    - interms of good yield, cost and energy reduction etc
- Under Poly house, net house, green house conditions must have product
    - To have control on energy to fit in stipulated time schedule on fertigation practices

KALAIVIZHA 2019

Inauguration of Kalaivizha 2019

Kalaivizha exhibition stalls displayed by A2I Club students

IV. SHORT TERM WORKSHOPS AND TRAININGS –
CENTRE FOR MACHINE LEARNING AND INTELLIGENCE:

Machine Learning and Intelligence

Organizing Committee

Chief Patrons

Dr. T.S.K. Meenakshisundaram
Managing Trustee

Dr. P.R. Krishnakumar
Chancellor

Patrons

Dr. Premavathy Vijayan
Vice Chancellor

Dr. S. Kowsalya
Registrar

Dr. K. Udaya Chandrika
Dean, School of Physical Sciences & Computational Sciences

Advisors

Dr. T. Geetha
Dean, School of Education

Dr. R. Annakodi
Co-ordinator, School of Education

Workshop Co-ordinators

Dr. M. Chandravathana
Associate Professor, Department of Education

Dr. C. Karthik Deepa
Assistant Professor, Department of Education

Members

Mrs. S.S. Manimozhi
Mrs. S. Andal
Mrs. K. Kalaivani
Mrs. A. Mangalambigai
Mrs. K. Deepa
Mrs. R. Nithya
Mrs. T. Premalatha
Mrs. R. Vaijayanthi
Dr. V. Mrunalini
Ms. A. Suryalatha
Dr. S. Revathi
Dr. P. Jeeva Shanthi
Mrs. P. Santhamani

Saradalaya Press

Avinashilingam Institute for Home Science and Higher Education for Women
(Deemed to be University under Category A by MHRD, Estd. u/s 3 of UGC Act 1956)
Re-accredited with A+ Grade by NAAC. Recognised by UGC Under Section 12 B
Coimbatore - 641 043, Tamil Nadu, India

Department of Science & Technology
Government of India

DST-CURIE Sponsored
Three day (Consecutive)
Student Workshop on
"Machine Learning and Artificial Intelligence in Education"
19th - 30th September 2019

Organized by
Department of Education - School of Education

Details of Dates
First Workshop : 19th -21th Sep. 2019
Second Workshop : 23rd -25th Sep. 2019
Third Workshop : 26th -30th Sep. 2019

Venue
Multipurpose Hall
School of Education

Avinashilingam Institute for Home Science and Higher Education for Women
(Deemed to be University under Category 'A' by MHRD, Estd. u/s 3 of UGC Act 1956)
Re-accredited with 'A+' Grade by NAAC. Recognised by UGC Under Section 12 B
Coimbatore-641 043, Tamil Nadu, India

Department of Education
DST-CURIE Sponsored Three day
(Three consecutive) student workshop
On
"Machine Learning and Artificial Intelligence in Education"
19th- 30th September 2019

Program Schedule

Day 1
Mr. L. Ramesh, CEO & Team
Beta Technologies India PVT LTD, Coimbatore
Session 1: Educational Robotics- Hands-on Experience
Session 2: Machine learning in the 21st century

Day 2
Dr. J. Ghayathri
Associate Professor
PG Department of Computer Science
Kongu Arts and Science College, Erode
Session 1: Applications of Artificial Intelligence in Learning Environment
Session 2: Applications of Machine Learning in Learning Environment

Day 3
Dr. K. Thiyagu
Associate Professor, Department of Education
Central University of Kerala, Kasaragod
Session 1: Mobile apps in teaching, learning and assessment
Session 2: Pedagogy of Artificial Intelligence

VENUE: MULTI PURPOSE HALL, SCHOOL OF EDUCATION
Dates: 1st batch 19 -9-2019 to 20.9. 2019
2nd batch -23.9.2019 to 25.9.2019
3rd batch 26.9.2019.to 30.9.2019

CENTRE FOR MACHINE LEARNING AND INTELLIGENCE

1. MACHINE LEARNING AND ARTIFICIAL INTELLIGENCE IN EDUCATION

DAY I : Inaugural Function

The inaugural function was started with the Prayer song and Lighting the LAMP. Welcome address was given by Dr.M.Chandravathana, Associate Professor and Dr. R. Annakodi Co-ordinator, School of Education, introduced the chief guest Mr. M.L.Ramesh, CEO Beta Technologies India PVT LTD, Coimbatore. The chief guest delved the inaugural address by highlighting the importance and need of Artificial Intelligence in day to day life Education. He also talked about importance of Tinkering Lab and skill lab for the school children and the need for the teachers to update themselves to meet the need of present generation learners with more advanced skills and innovations. Dr.C.Karthik Deepa, Assistant Professor, proposed the vote of thanks

Inaugural Function - MACHINE LEARNING AND ARTIFICIAL INTELLIGENCE IN EDUCATION, chief guest Mr. M.L.Ramesh, CEO Beta Technologies India PVT LTD, Coimbatore

Student teachers working in groups to develop robots

DAY 2

Session 1: e-brain and Smart Learning

Session 2: Innovative Education Applications of Natural Language Processing

The second day of the seminar was taken by Dr.J.GHAYATHRI, Associate professor, Department of Computer Science (PG) Kongu Arts and Science College, Erode. She has 26 years of academic experiences in various educational institutions. She is specialized in Artificial Intelligence, Knowledge Management and Business intelligence. She is a journal reviewer for 3 journals and journal editorial for one.

Innovative Education Applications of Natural Language Processing - Dr.J.GHAYATHRI, Associate professor, Department of Computer Science (PG) Kongu Arts and Science College, Erode

DAY 3

Session 1: Mobile apps in teaching, learning and assessment

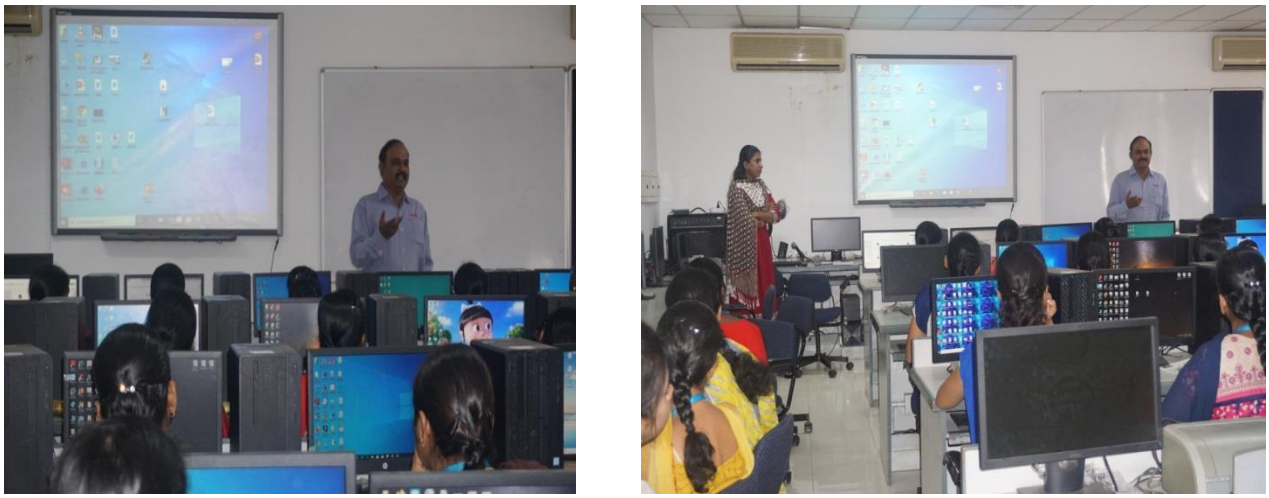
The third day of the Workshop was taken by Dr.K.Thiyagu, Assistant Professor, Department of Education, School of Education (SEd) in Central University of Kerala, Kasaragod

Pedagogy of Artificial Intelligence, Dr.K.Thiyagu, Assistant Professor, Department of Education, School of Education (SEd) in Central University of Kerala, Kasaragod

The resource person and teachers are share their moments and creative ideas. After that they gave the certificates for their student teachers.

Distribution of Certificates for the participants of the workshop

2. ARTIFICIAL INTELLIGENCE FOR BUSINESS



The main objective of the artificial Intelligence course is to give a comprehensive knowledge of the basic techniques for creating intelligent computer systems and a perception of how AI is applied to problems by introducing AI's key problems, and the state-of-the-art models and algorithms used to undertake these problems. The course is outlined to provide a summary of AI concepts and workflows, machine learning and deep learning, OPEN-CV,

TensorFlow and statistics essentials while providing a sufficiently strong foundation to encourage further research.

ARTIFICIAL

INTELLIGENCE FOR BUSINESS 0rganized by School of Business management

3. WORKSHOP ON MATLAB

Objective:-

The workshop was based on the MATLAB.

The centre for machine Learning and Intelligence (Campus-I) conducted a workshop on MATLAB.

- As part of capability improvement among students who will be involved in AI project with various concepts
- We had organized the hands on training session on MAT lab experiential session
- Students were given their involvement in learning the tools which they can operate for their respective project topics, and applications that they can use it for future AI activities
- 20 number of students were able to learn, develop and upskills on their hands on practice through this training event

The Resource persons are

Dr.P.Subashini, Professor (Department of Computer Science)

Dr.M.Krishnaveni, Assistant Professor (Department of Computer Science)

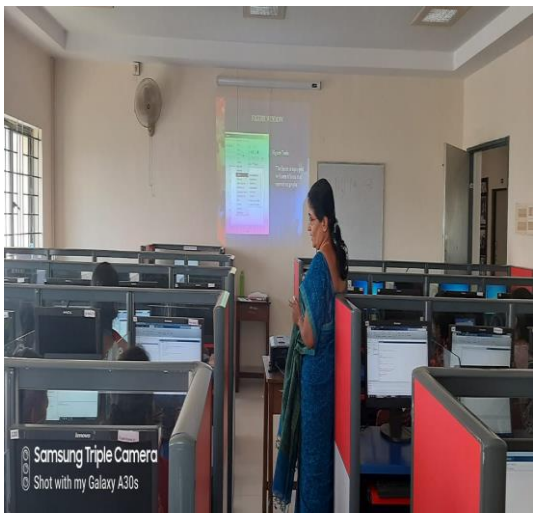
Mr. Raj Kumar (Mathworks Ltd., Chennai)

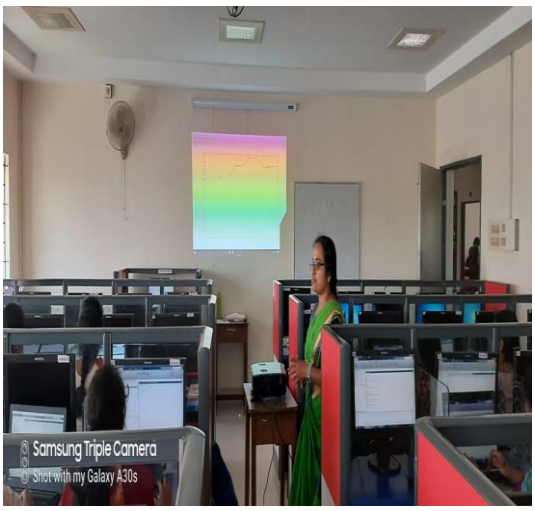
About the Training Program

- To provide a theoretical & practical session in MATLAB
- MATLAB functions
- To Write simple MATLAB programs

- Gain the knowledge of MATLAB tool and needed to successfully solving numerical Computation, visualization and programming.

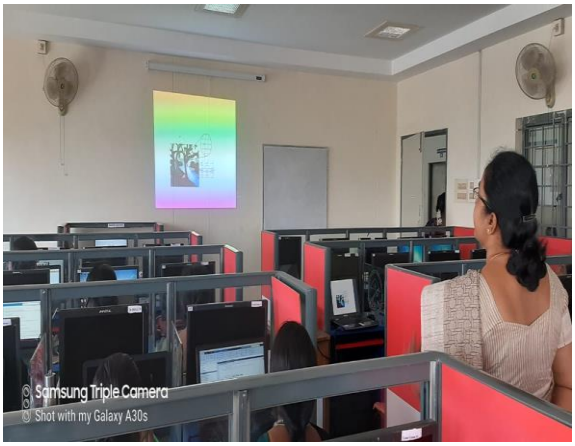
Session 1:**(24.01.2020 9.30 Am to 1.00 Pm)**

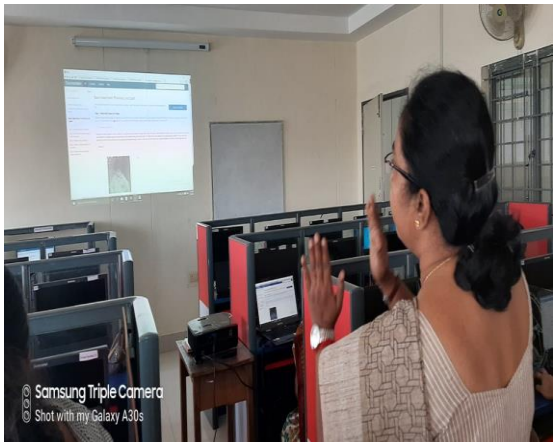




Workshop - Dr.P.Subashini, Professor (Department of Computer Science)

Session 2: (27.01.2020 9.30 Am to 1.00 Pm)



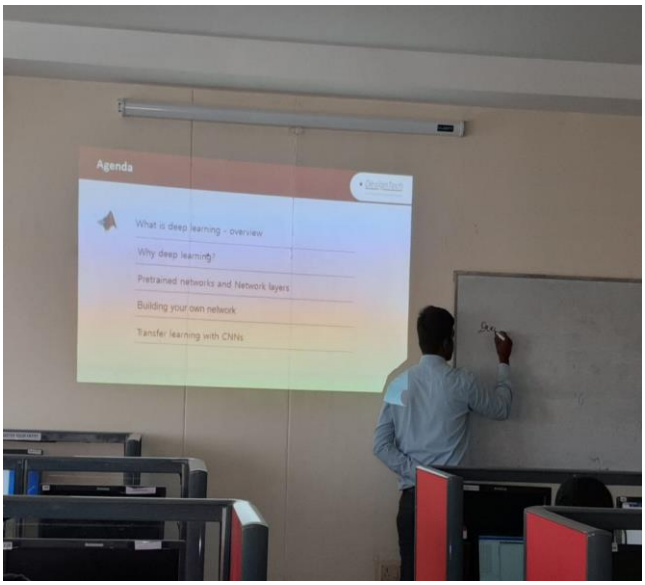


Workshop Dr.M.Krishnaveni, Assistant Professor (Department of Computer Science)

Session 3: (28.01.2020 1.00 Pm to 4.30 Pm)

Workshop Dr.M.Krishnaveni, Assistant Professor (Department of Computer Science)

Session 4: (03.02.2020 9.30 Am to 5.30 Pm)



Workshop - Mr. Raj Kumar (Mathworks Ltd., Chennai)

CENTRE FOR ARTIFICIAL INTELLIGENCE AND ROBOTICS:

1. Three days hands-on training on Embedded Computing for IoT Systems

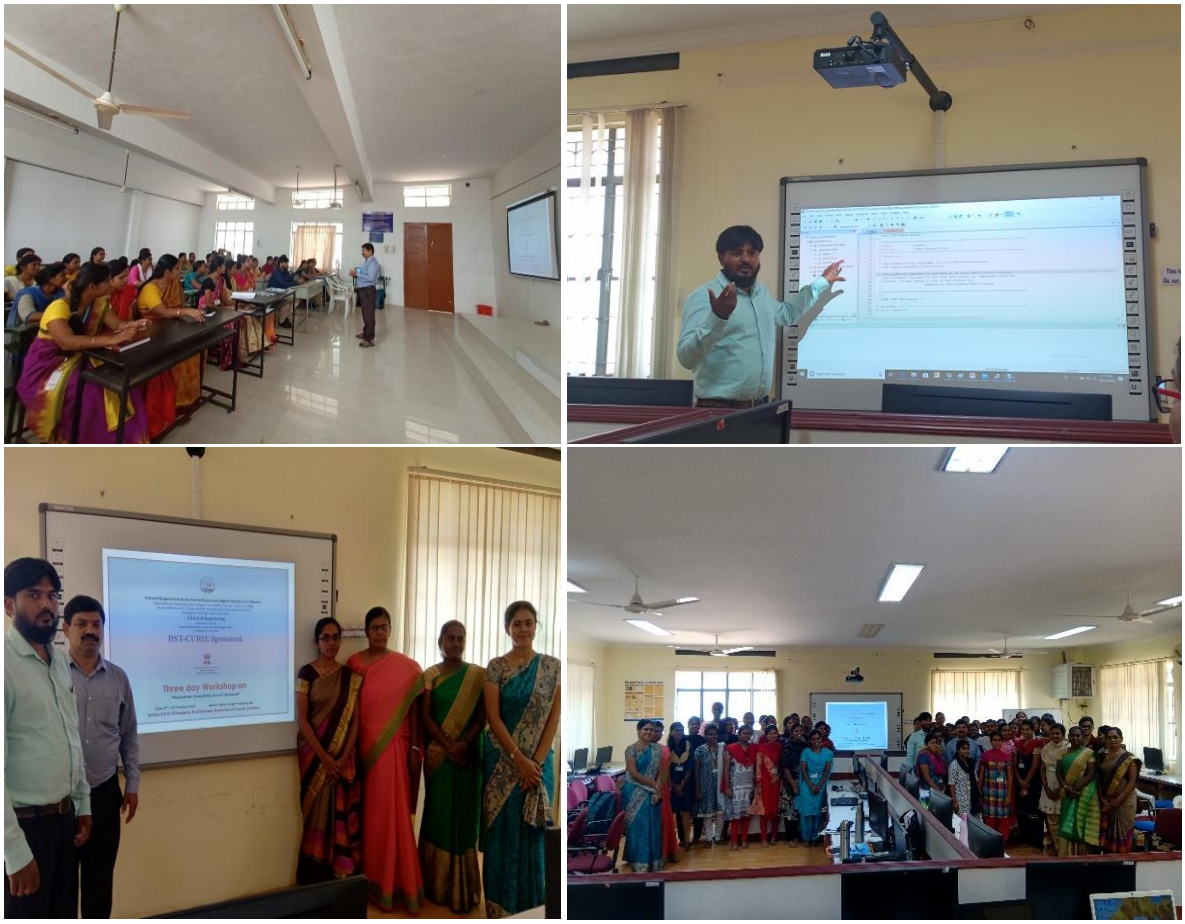
Mr. A. S. Varun Gaikwad, Regional Technical Manager, Nanochip Solutions Pvt. Ltd., Bangalore delivered the inaugural address. In his address, he explained about the technical aspects of embedded system, the basic components of an embedded system such as embedded hardware embedded RTOS, device drivers, communication stacks and the demand for embedded solutions across various industry verticals. He also stated that, since the world is experiencing ground breaking research in hardware technology (Nano-technology, quantum mechanics, etc.), packing more power into single chip will soon be a reality.

Finally he stated the importance of IEEE certification after attending three day training on Embedded Computing for IoT Systems.

The training was given by **Mr. Mohammed Asif,** Embedded Design Training consultant, Nanochip Solutions, Bangalore using STM32F401RET6 - MCU 32-Bit STM32 ARM Cortex M4 RISC.

It is based on the high-performance ARM Cortex-M4 32-bit RISC core operating at a frequency of up to 84 MHz Cortex-M4 with a Floating point unit (FPU) single precision supports all ARM single-precision data-processing instructions and data types. It also implements a full set of DSP instructions and a Memory Protection Unit (MPU) which enhances application security. STM32F401xB / STM32F401xC devices incorporate high-speed embedded memories (Flash memory up to 256 Kbytes, up to 64 Kbytes of SRAM) and an extensive range of enhanced I/Os and peripherals connected to two APB buses, two AHB buses and a 32-bit multi-AHB bus matrix. All devices offer one 12-bit ADC, a low-power RTC, six general-purpose 16-bit timers including one PWM timer for motor control, two general-purpose 32-bit timers. They also feature standard and advanced communication interfaces.

He discussed the concepts of ARM architecture and software development. The students were taught to write programs using Keil software and download the program image to the microcontroller program memory and debugging.



Three days hands-on training on Embedded Computing for IoT Systems -

Mr. A. S. Varun Gaikwad, Regional Technical Manager, Nanochip Solutions Pvt. Ltd., Bangalore

2 : NI Robotics

Mr. T.R. Balaji, Application Engineer, Optithought, Chennai is the Resource Person for the One Day training on NI Robotics.

NI Robotics Hardware Bundle was trained

- Rover Vehicle Assembly System
- Balancing Arm Assembly System
- Self-Balancing Robot Assembly System

The students were trained to configure MyRio and assemble the robot




Workshop on NI Robotics - Mr. T.R. Balaji, Application Engineer, Optithought, Chennai

3: One day Programme on Intelligent Sensing Technology for Non-Destructive Evaluation of Structures

Department of Civil Engineering, School of Engineering, Avinashilingam Institute for Home Science and Higher Education for Women conducted a One Day workshop on **"Intelligent Sensing Technology for Non-Destructive Evaluation of Structures"** on 07.11.2019 with the technical expertise from **Leading Edge Lab Equipments, Coimbatore**.The inaugural function started with the Inagural address by **Dr.R.Nithya, Head of the Department.** She presented the basic concept of Non destructive techniques and its applications in the present scenario. She greeted the experts from **Leading Edge Lab Equipments, Coimbatore** and introduced them to the participants.

The scheduled session of the workshop started with the **Introduction to Non Destructive Testing Techniques** by the, Technical expert, Leading Edge Lab Equipments, Coimbatore. He explained in detail about application of NDT in the evaluation of existing concrete structures with regard to their strength and durability apart from assessment and control of quality of hardened concrete without or partial damage to the concrete.




Workshop on "Intelligent Sensing Technology for Non-Destructive Evaluation of Structures" , Leading Edge Lab Equipments, Coimbatore

4 : Two day workshop on 'Applications of IoT based food quality monitoring approach using sensor'

DST CURIE-AI sponsored two day workshop on "**Application of IOT based on Food Quality Monitoring Approach using Sensor"**was organized in the Department of Food Processing and Preservation Technology on 17th& 18th December, 2019 (Tuesday & Wednesday).

- The session was inaugurated at 9.30 am by the Director Dr. Raja Rao. He introduced the concepts of IoT and its applications in Food Processing.
- He related on the system of interrelated computing devices, mechanical and digital machines, objects, that are provided with unique identifiers. He also explained about ability to transfer data over a network without requiring human to computer interactions.
- Mr. B.Premchander, Manager- Gateway software solution and Mr.M.Suriya Prakash, IOT Developer - Gateway software solution were the Guest speakers.
- The II,III and Final year students, PG students and staff members of the Department of FPPT were the audience.
- On day 1, the technical workshop session was started at 10.30 am by Mr.M.Suriya Prakash, IOT Developer - Gateway software solution. An introduction on embedded devices connected to the internet used for collecting and exchanging data was given.
- He explained about the sensor used in food industries and its applications and he gave brief explanation about deep learning, machine learning, and artificial intelligence.
- On day 2, explanation on arduino types and applications was given. The Chief Guest addressed the gathering and raised a few questions to the students about embedded systems.
- Hands on training on embedded devices and cloud was given to the students.
- Hands on training on developing a programme coding and explanation on the procedure involved in interfacing of sensors and arduino board was also given to the students.
- Application of IoT in Food Processing was illustrated with information on proximate sensor and gas sensor.
- At the outset, the workshop was very informative to all the participants.

Two day workshop on 'Applications of IoT based food quality monitoring approach using sensor', Guest speech - Mr. B.Premchander and Mr.M.Suriya Prakash, Gateway software solution.

5: Artificial Intelligence for Cloud Based Internet of Things (IoT)

Department of Electronics and Communication Engineering, School of Engineering, Avinashilingam Institute for Home Science and Higher Education for Women conducted a Two Day workshop on **"Artificial Intelligence for Cloud Based Internet of Things (IoT)"** on 19.12.2019 and 20.12.2019.The inaugural function started with the welcome address by **Dr.B.Sargunam, Head of the Department.** Followed the inaugural address by **Prof.K.N.Raja Rao, Director,** School of Engineering. He presented the basic concept of Internet of Things and its applications in the present scenario.

Dr.S.Maragatham, Dean, School of Engineering felicitated the gathering for the successful conduct of the programme. She congratulated the department for organising such a programme for enhancing the knowledge of the students in the latest topic in collaboration with the technical expertise from **TwirlTact Technology Solutions Pvt. Ltd., Coimbatore.** She greeted the Founder of TwirlTact Technology Solutions **Dr.Shyam Prashad Rajasekaran** to motivate the students in developing real time application based prototypes.

The inaugural function ended by the vote of thanks delivered by **Dr.D.Veera Vanitha, Assistant Professor,** Department of ECE. After the break the session started with an inspiring talk by **Dr. Shyam Prashad Rajasekaran.** He shared his journey as a student to successful entrepreneur. The challenges faced by him in developing such a strong firm in serving technical education in IoT to students and helping them in developing projects. His interaction motivated students to start a frim only with simple ideas and inspiration of becoming an entrepreneur.

In the afternoon session he discussed about the basic electronic components such resistors, capacitors and transistor. Also he projected videos relating to basic errors commonly people do in real world when handling electrical devices and their hazardous effects. Continued the presentation he detailed about the Arduino Nano software.

The second day of the workshop is scheduled with the hands on training to code for various types of sensors. The list of programs executed are listed below

1. Distance Measurement using Ultrasound Sensors
2. Vibration Measurement Sensor
3. Smoke Sensor
4. Touch Sensor
5. Soil Moisture Detection sensor
6. Working on IR Sensor
7. Humidity and Temperature Sensor.

The morning session is completely engaged with working with different types of sensors and their parameter measurement. In the afternoon session programming to send the measured data of the sensor to cloud through wifi is performed.

Artificial Intelligence for Cloud Based Internet of Things (IoT), Resource persons - TwirlTact Technology Solutions Pvt. Ltd., Coimbatore

6 : Artificial Intelligence and Machine Learning using MATLAB

The department of Biomedical Instrumentation Engineering organized a three day workshop on "**Artificial Intelligence and Machine Learning using MATLAB"** jointly with MathWorks, Bangalore during 17th to 19th December 2019.

The participants were faculties and students from various colleges such as:

- Karunya Institute of Technology and Sciences, Coimbatore
- SNS College of Technology, Coimbatore
- K.Ramakrishnan College of Engineering, Trichy
- KalaignarKarunanithi Institute of Technology, Coimbatore
- Sri Ramakrishna Engineering College, Coimbatore

- Avinashilingam Institute for Home Science and Higher Education for Women, Coimbatore

Objective of the workshop:

- To offer intensive hands-on training in Image processing, machine vision and Optimization using MATLAB
- To impart knowledge on MATLAB toolboxes for Machine Learning and Deep Learning for applications related to Artificial Intelligence.
- To provide opportunities to embark and adopt AI technology in research with the help of MATLAB.
- To help implement algorithms in new avenues in Engineering.




"**Artificial Intelligence and Machine Learning using MATLAB", Resource persons -** MathWorks, Bangalore

PROCUREMENT OF EQUIPMENT'S

Centre for Machine Learning and Intelligence & Centre for Artificial Intelligence and Robotics under the DST-CURIE-AI Facility

S.No	Description	Qty
1.	NI Robotics hardware bundle	1
2.	Desktop Computers	4
3.	Network Printer	1
4.	Printer	1
5.	Super micro/Boston Model-Server I and II	1
6.	Arduino Development Board	1
7.	Ultrasonic Sensor Interface	1
8.	Temperature & Humidity Sensor Interface	1
9.	IR Obstacle Sensor Interface	1
10.	LDR Sensor Interface	1
11.	Fire Sensor Interface	1
12.	PIR Sensor Interface	1
13.	Touch Sensor Interface	1
14.	Hall Sensor Interface	1
15.	IR Receiver Sensor Interface	1
16.	Rotary Encoder Sensor Interface	1
17.	Voltage Sensor Interface	1
18.	Current Sensor Interface	1
19.	Blue Tooth Sensor Interface	1
20.	Speed Sensor Interface	1
21.	RTC Interface	1
22.	DC Motor Interface	1
23.	DC Servo Interface	1
24.	Stepper Motor Interface	1
25.	LCD Interface	1
26.	LEDs & Switches Interface	1
27.	Arduino Uno Board	5
28.	DC Adapter for Arduino	2
29.	USB Cable for Arduino	5
30.	Raspberry Pi 4 B Board with 2 GB	2
31.	VGA to HDMI Converter for Raspberry	1
32.	SD Card with OS for Raspberry	1
33.	Temperature DHT 11 Sensor	5
34.	Air Quality Gas Sensor	5
35.	Ultrasonic Sensor	5
36.	Soil Moisture Sensor	5
37.	Jumper Wire Male to Male	100
38.	Jumper Wire Male to Female	100
39.	Jumper Wire Female to Female	100

40.	LED 5 mm Red	5
41.	LED 5 mm Green	5
42.	LED 5 mm Yellow	5
43.	LED 5 mm White	5
44.	LED 5 mm Amber	5
45.	Bread Board	5
46.	Carbon Film Resistor : 0.25W: Assorted Values	60
47.	Blue Tooth HC 06 Sensor	3
48.	Wi Fi ESP 8266 Sensor	3
49.	IR Obstacle Sensor	5
50.	LDR Sensor	5
51.	Flame Sensor	3
52.	PIR Sensor	5
53.	Touch Sensor	3
54.	Voltage Sensor	3
55.	Current Sensor	3
56.	DC Servo Motor	5
57.	RFID Sensor	5
58.	Water Level SEN 18 Sensor	5
59.	Colour Detection TCS Sensor	2
60.	Dust Sensor	1
61.	DC Pump Motor	5
62.	LCD Display 16 x 2 Character	5
63.	Keypad 4 x 4	3
64.	Battery Snap	10
65.	Dell Workstation	2
66.	HP Laserjet M1005 printer	1