

Can computers truly achieve human intelligence?

In this day and age, we trust the computer to do a lot of things for us. We rely on it to wake us up in the morning, keep us entertained, make intricate calculations for us, interpret our data, etc. We often believe it to be the smartest and fastest machine to exist, and we almost forget that it was in fact the human brain that created this powerful computing machine. Therefore, the most efficient and powerful computing machine to ever exist is probably the human brain. This finally brings us to the age-old debate 'Can a computer actually beat the human brain?' Well, the answer to this lies in - Neuromorphic Computing, information and even make logical deductions the way a human brain can i.e., a cognitive machine, the second is to acquire new information and prove a rational theory that a human brain can be emulated on a chip. The exact sequence of events that take place when we do a particular activity on our computer completely depends on its inherent architecture. Almost all modern computers we use are based on the Von Neumann architecture. Here, the processor is responsible for executing instructions and programs, while the memory stores those instructions and programs. Von Neumann architecture separates out memory and computing because von Neumann chips have to shuttle information back and forth between the memory and CPU, they waste time and energy, a problem known as the von Neumann bottleneck. Semiconductors are often called the brains of electronics. Over time, the power of these tiny silicon chips has grown exponentially in terms of computing power on a chip (following Moore's Law) even as their circuitry has shrunk to unimaginably small sizes. But with power-hungry autonomous vehicles, robots, drones, and other self-reliant machines requiring small yet strong and energy. Neuromorphic computing implements aspects of biological neural networks as analog or digital copies on electronic circuits. Here, the elements of the computer are modeled after the human brain and nervous system.

Neuromorphic engineers draw from several disciplines, including computer science, biology, mathematics, electronic engineering and physics, to create artificial neural systems inspired by biological structures. This approach has two main goals - the first is to create a device that can understand the dynamic process of learning, retaining chips, cramming more and more of these transistors onto these von Neumann processors will not cut out anymore as the traditional semiconductors have reached the limits of miniaturization and capacity. Thus, one promising alternative that is gaining considerable momentum seems to be neuromorphic computing. Key advantages of neuromorphic computing compared to traditional approaches are

1. energy efficiency
2. low consumption of power
3. high execution speed
4. robustness against local failures
5. the ability to learn
6. higher adaptability and fault tolerance
7. mobile architecture

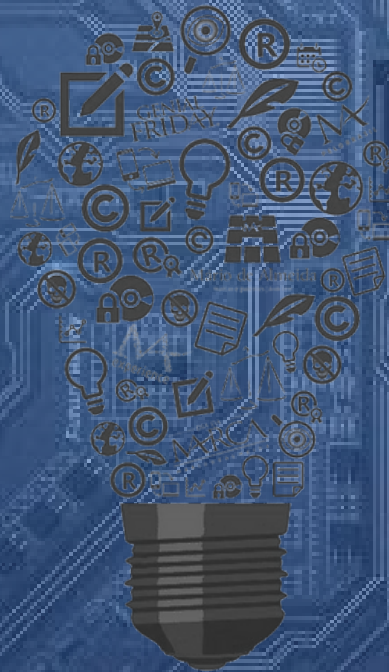
The real-world examples (although mainly used for research purposes) that exist today include The Tianjie chip. Used to power a self-driving bike capable of following a person, navigating obstacles, and responding to voice commands. It had 40,000 neurons, 10 million synapses and performed 160 times better and 120,000 times more efficiently than a comparable GPU Intel's Loihi chips. Have 130 million synapses and 131,000 neurons per chip. It is optimized for spiking neural networks. Intel's Pohoiki Beach computers. Features 8.3 million neurons. It delivers 1,000 times better performance and 10,000 times more efficiency than comparable GPUs. IBM's True North chip. Has over 1 million neurons and over 268 million synapses. It is 10,000 times more energy-efficient than conventional microprocessors and only uses power when necessary.

By
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II - ECE



DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Intellectualis



VOLUME II
ISSUE 2
January 2023

Hello Readers!

With immense pleasure, we bring to you yet another successful edition of Newsletter - Intellectualis, on behalf of the department of ECE!

In this edition, we present to you a wealth of knowledge, interesting research and thoughtful discourse on all that is exciting in the world of ECE. Most of all, this edition is a foray into the numerous exciting activities undertaken by both faculty as well as the students of our department and we are honoured to document them and present them to you.

We hope you enjoy reading Impulse as much as we did creating it!

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Vision of the Department:

To produce globally competent Electronics and Communication Engineers with a commitment to serve the society.

Mission of the Department:

M1: To establish a conducive learning environment to meet the demands of society.

M2: To provide cutting-edge technical education to produce engineers with the highest calibre of professionalism.

M3: To encourage creative thinking and support research to use technology to enhance people's quality of life.

M4: To provide high quality, ethical engineers for the good of society.

Program Educational Objectives (PEOs)

Within three to five years, our graduates of Electronics and Communication Engineering program are expected to

PEO I: Apply their engineering abilities to resolve technological issues facing industry.

PEO II: 1.Analyze real-world issues and design systems that are suited for delivering technically sound, financially viable, and socially acceptable answers.

PEO III: 1.Contribute towards entrepreneurship, exhibit professionalism, ethical attitude, communication skills, team work in their profession and adapt to current trends by engaging in lifelong learning.

Program Specific Outcome (PSO):

Students of the Electronics and Communication Engineering Program

1. 1.Shall have Potential to analyze, design, synthesize and provide technical solutions in the field of VLSI, Embedded Systems, Communication, Networking and Real Time Processing.

2. 1.Shall exhibit leadership skills and pursue entrepreneurship and contribute in the field of Electronics and Communication Engineering.

Events Organized by the Department:

1. Mr.P.Parthiban, AP, organized Certificate course program on "Green Technology" for third and final year students in Coordination with VeeEee Technologies Solutions (P) Ltd., Chennai.

2. Dr.R.Dhilip Kumar, Asso. Prof., organized a Workshop on "Advances in Optical Communication". The resource person was Mr. R. Prabu, Managing Director, Retech Solutions Pvt. Ltd., Chennai.

3. As a part of IIC activity, Dr.M.Jasmin, Asso.Prof., organized Guest Lecture on "How to become a Successful Entrepreneur". The resource person was Mr. G. Ramganes, Managing Director, Sriram Electro Tech, Chennai.

4. Mr.D.Gowrishankar, AP, IIC Convenor & NPIEC - Coordinator, has organized two days Workshop in association with Shell Nxplorers and Learning Links Foundation on "Entrepreneurial Mindset for Innovative Ideas" delivered by Mr. Ramaiah Chidambaram, Head-Industry 4.0, CIIC, Chennai.

5. Ms.V.Hemamalini, AP, organized Guest Lecture on "Analysis of CT Signals using MATLAB". The resource person was Mr. P. Srinath, Project Manager, VeeEee Technologies Solutions (P) Ltd., Chennai.

6. The department in association with Institution's Innovation Council organized Innovation contest - Presentation of Innovation Projects to bring out innovative ideas among the students.

7. Mr.D.Gowrishankar, AP, IIC Convenor & NPIEC - Coordinator, has organized Guest Lecture in association with NPIEC & Crescent Innovation Incubation Council on "Entrepreneurship and Career Opportunities in Recent Technologies" delivered by Mr. Ramaiah Chidambaram, Head-Industry 4.0, CIIC, Chennai.

8. Mr.N.Arun Balaji, AP, has organized Guest Lecture on "Applications of Control Systems in Robotics", delivered by Dr. R. Balamanigandan, Associate Professor, SIMATS, Chennai.

9. The department in association with Alumni Association organized a Guest Lecture on Applications of Different Processors, delivered by our department Alumni, Mr. A. Paul Johnathan Raj, Technical Specialist, HCL Technologies, Chennai.

10. Dr.G.Ramprabu, Prof., has organized a FDP on "Wireless Sensor Network and Internet of Things" from 12-12-22 to 17-12-22.

11. Ms.G.Vijayakumari, AP, organized a Guest Lecture on "Uncertainty in Supply Networks", delivered by Mr. Ramaiah Chidambaram, Head-Industry 4.0, CIIC, Chennai.

12. The department arranged an Industrial Visit to Madras Atomic Power Station (MAPS) and Indira Gandhi Centre for Atomic Research (IGCAR) located at Kalpakkam on 29.11.2022.

FDPs, STTPs, Workshops Attended by the Faculty members:

1. Dr.G.Durgadevi, Prof. & Head - had attended one Week Virtual FDP on Emerging Research Trends in Computing Technology at Dr.M.G.R. Educational and Research Institute from 28-11-2022 to 02-12-2022.

2. Dr.M.Jasmin, Asso.Prof. - had attended one Week Virtual FDP on Emerging Research Trends in Computing Technology at Dr.M.G.R. Educational and Research Institute from 28-11-2022 to 02-12-2022.

3. Dr.M.Jasmin, Asso.Prof. - had participated and has successfully completed the three-week "Women Entrepreneurship Development Programme" sponsored by NSTEDB, Department of Science and Technology, Ministry of Science and Technology, Government of India, New Delhi held from 3rd July 2022 to 21st July 2022 organized by VIT Business School, Vellore Institute of Technology, Vellore, Tamil Nadu, India.

4. Ms.V.Hemamalini, AP - had attended one Week Virtual FDP on Emerging Research Trends in Computing Technology at Dr.M.G.R. Educational and Research Institute from 28-11-2022 to 02-12-2022.

5. Ms.S.Sivakami, AP - had attended one Week Virtual FDP on Emerging Research Trends in Computing Technology at Dr.M.G.R. Educational and Research Institute from 28-11-2022 to 02-12-2022.

Student Achievements:

1. M.Kartheeswari, S.Gomathi, P.Rajalakshmi of II-ECE have won 2nd Prize in Technical Quiz event held at Ramco Institute of Technology, Rajapalayam.

2. A. Aravindraj of IV - ECE has Won 1st Prize at Inter-club table tennis tournament 2022.

3. M.Krishna Murthi of III - ECE, has Won 1st Prize in Kumite at National Level Karate Championship.

4. J.Jagadesh, G.Harikrishnan, P.Karthik II - ECE, have won 2nd Prize in Prototype Presentation held at AAA College of Engineering and Technology, Sivakasi.

5. M.Krishna Murthi of III - ECE and P.Sakthivel of IV - ECE have won 1st Prize in Technical Quiz event Mahendra College of Engineering, Salem.

6. S.Balaji, G.Harikrishnan of II - ECE have attended a Seminar titled "Solar Projects, Future Technology, Growth & Opportunities" at Madanapalle Institute of Technology and Science, Madanapalle.

7. The students of II, III and IV year have attended Internships at National Small Industries Corporation Ltd., Chennai, Superfect Solution Pvt. Ltd., Chennai and Retech Solutions Pvt. Ltd., Chennai.

Professional Roles and Recognitions:

1. Dr.M.Jasmin, Asso.Prof. - had been the Resource Person for the Seminar on "How to develop new Innovative Products" at Thangavelu Engineering College, Chennai.

2. Dr.M.Jasmin, Asso.Prof. - had been the Resource Person for the Webinar on Contemporary Trends and Challenges in Electronics and Communication held at Saveetha Engineering College.

3. Dr.G.Durgadevi, Prof. & Head - has been invited as a DC member for Confirmation DC meeting of Research Scholar at M.G.R Educational and Research Institute.

