Vel Tech
Rangarajan Dr. Sagunthala
R&D Institute of Science and Technology
(Deemed to be University Estd. u/s 3 of UGC Act, 1956)

NAAC A++

Recognised as CATEGORY-1 DEEMED TO BE UNIVERSITY by the UGC University Grants Commission

MAGAZINE

ENSIGHT BYTES

2023-2024

School Of Computing
Department of Computer Science And Engineering

Vision & Mission

Becoming Healthy Life Style

Vision

To produce intellectual graduates who could contribute significantly in the analysis, design, development, operation and maintenance of complex software systems for meeting the ever changing requirements of service systems and to compete globally towards professional excellence.

Mission

M1: *Design curricula for imparting training in adapting newer computing methods and technologies for providing effective and efficient solutions to the existing / new problems.*

M2: *Emphasizing in-depth knowledge of the subjects by employing Information and Communication Technology (ICT) based pedagogy methods.*

M3: *Creating a conducive research environment for making technological innovations by the faculty and students.*

M4: *Providing leadership skills and professional ethics thereby making a prolific career in academics and industry.*

Small steps today ***stronger tomorrow!***

PROGRAM EDUCATIONAL OBJECTIVES

PEO's

PEO1: The graduates of B.Tech Computer Science and Engineering will be able to formulate, solve and analyze Computer Science and Engineering problems using necessary mathematical, Scientific and engineering fundamentals.

PEO2: The graduates of B.Tech Computer Science and Engineering will be able to demonstrate the impact of cutting-edge technologies to accomplish social and professional responsibilities.

PEO3: The graduates of B.Tech Computer Science and Engineering will be able todemonstrate critical thinking, communication, teamwork, leadership skills and ethical behavior necessary to function productively and professionally.

PEO4: The graduates of B.Tech Computer Science and Engineering will be able to pursue higher education at reputed institution in India and abroad, work in product development companies and engage in lifelong learning.

INSTITUTION HEADSHIPS

Col. Prof. Vel. Dr. R. Rangarajan
B.E. (Elec), B.E. (Mech), M.S. (Auto), D.Sc.,
Founder President & Chancellor

Dr. Sagunthala Rangarajan
MBBS
Foundress President

Mrs. Rangarajan Mahalakshmi Kishore
B.Tech, M.Tech, MBA(UK),
Chairperson & Managing Trustee

Prof. S. Salivahanan
B.E, M.E, Ph.D.
Vice-Chancellor

Prof. Dr. V. Srinivasa Rao
B.E, M.E, Ph.D.
Professor
Dean - School of Computing

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Inaugural Function Induction-cum-AcquaintanceProgram (6 August 2023)

9New engineering students were introduced to academic structures, campus resources, disciplinary ethics, and support services. Faculty mentors and senior students facilitated orientation activities to help students integrate smoothly.

Partial Delivery of Courses

Short course on computer vision with deep learning

Vel Tech University had the honor of hosting Prof. Dr. Sandeep Singh Sengar from Cardiff Metropolitan University, UK, who delivered a short course on "Computer Vision with Deep Learning" from 1st to 3rd April 2024. Organized by the Office of International Relations in association with the Department of Computer Science and Engineering, the program provided students with cutting-edge insights into the integration of computer vision techniques with deep learning models, fostering global exposure and advanced learning opportunities.

GPT-4 TURBO AND AGENTIC AI

Breakthrough Overview

In late 2023, OpenAI launched GPT-4 Turbo, a monumental shift from a conversational AI to an "agentic" AI. It's designed to autonomously execute complex, multi-step tasks, fundamentally changing the automation landscape for software engineers and developers.

Technical Specifications

- 128K Context Window: Processes the equivalent of over 300 pages of text in a single prompt.
- Reduced Cost & Higher Rate Limits: API calls are 3x cheaper for input tokens and 2x cheaper for output tokens than GPT-4, enabling scalable integration.
- Improved Instruction Following & JSON Mode: Better at producing structured outputs and adhering to complex instructions.

Applications

- Software Development: Autonomously writes, debugs, refactors, and completes entire code modules.
- Enterprise Automation: Handles multi-step customer support, data analysis, and report generation workflows.
- Research: Synthesizes information from massive documents, academic papers, and codebases.

Challenges

- Reliability: Can still "hallucinate" or make reasoning errors in long, complex chains.
- Security: Autonomous execution poses risks if not properly constrained and monitored.
- Compute Cost: Running long-context models remains computationally expensive.

Future Roadmap

OpenAI is focused on improving reasoning accuracy, reducing latency, and enabling more secure and reliable autonomous task execution for enterprise environments.

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Short course on "cognitive computing & applications"

Vel Tech University warmly welcomed Dr. Raja Kumar Murugesan from Taylor's University, Malaysia, for a short course on "Cognitive Computing & Applications", conducted from 1st to 3rd April 2024. The program, organized by the Office of International Relations in collaboration with the Department of Computer Science and Engineering, provided students with a comprehensive understanding of intelligent systems and their real-world applications, enriching their global academic exposure.

Art/Culture/Book Review

Vel Tech University proudly embraced the vibrant cultural heritage of Tamil Nadu throughout the year 2023, hosting a series of festive and artistic celebrations that fostered unity, tradition, and artistic expression among students and faculty alike.

Pongal celebration

The campus came alive with colors and joy during Pongal, the harvest festival, where traditional customs such as kolam decorations, Pongal pot rituals, and folk music set the tone for a spirited beginning to the year. Students actively participated in cooking competitions and showcased their talents in rural games and ethnic wear parades, bringing the essence of Tamil agrarian life to the academic setting.

GEMINI 1.5

Breakthrough Overview
In early 2024, Google DeepMind unveiled Gemini 1.5, a next-generation AI model featuring a revolutionary Mixture-of-Experts (MoE) architecture and a groundbreaking default 1 million token context window, enabling unprecedented analysis of vast datasets.

Technical Specifications
- Mixture-of-Experts (MoE): Efficiently activates only relevant parts of its network for a given task, improving speed and reducing compute cost.
- 1M Token Context: Can process massive amounts of data—over 1 hour of video, 11 hours of audio, or codebases with 30,000+ lines of code.
- Cross-Modal Understanding: Natively understands and reasons across text, code, images, audio, and video.

Applications
- Codebase Analysis: Developers can query an entire code repository for bugs, dependencies, or to generate documentation.
- Long-Form Content Analysis: Summarize legal documents, research papers, or hours of meeting transcripts with full context.
- Scientific Research: Identify patterns and correlations across massive scientific datasets.

Challenges
- Computational Demand: Processing a full 1M token context requires immense GPU resources.
- Latency: Initial processing of ultra-long contexts can be slow, though subsequent interactions are faster.
- Data Bias: Inherits biases present in the massive and diverse training data.

Future Roadmap
Google aims to make long-context processing more efficient and affordable, and to further integrate Gemini's capabilities into its search, cloud, and workspace products.

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Golu Celebrations:

Navarathri was celebrated with devotion and grace, marked by vibrant Golu displays and daily performances of classical dance and music. The celebrations were a confluence of tradition and devotion, featuring students performing Bharatanatyam and devotional songs that paid homage to the divine feminine.

Tamil New year Celebrations

The Tamil New Year (Puthandu) was ushered in with grandeur and elegance. The university hosted a cultural exhibition featuring the rich literary, culinary, and artistic traditions of Tamil Nadu. Students portrayed the stories of Sangam literature through villupattu, silambattam, and kavadi performances, highlighting the enduring legacy of Tamil civilization.

The year-long celebration of Tamil art forms included stirring performances of Silambattam, the ancient martial art of Tamil Nadu, as well as Karagattam, Oyilattam, and Mayilattam, which mesmerized the audience with their rhythm and storytelling. Students also showcased their finesse in Bharatanatyam, seamlessly blending tradition with contemporary themes.

These cultural festivals not only promoted awareness and appreciation of Tamil heritage but also instilled a deep sense of pride and belonging in the student community. Vel Tech's commitment to nurturing cultural roots alongside academic excellence continues to inspire a well-rounded, inclusive learning environment.

HUMANE AI PIN

Breakthrough Overview
Launched in 2023, the Humane AI Pin is a screenless, wearable device powered by a sophisticated AI. It represents a new paradigm of "ambient computing," using a laser projector to display information onto the user's palm and relying on voice and gesture for interaction.

Technical Specifications
- Laser Ink Display: Projects a monochrome UI onto the user's palm.
- Voice-First Interface: Interacts primarily through a built-in speaker and microphone.
- AI-Centric OS: Runs on a custom OS built around a powerful language model, not traditional apps.
- Snapdragon Processor: Handles on-device processing.

Applications
- On-the-Go Computing: Sends messages, makes calls, and answers questions hands-free.
- Real-Time Translation: Translates spoken language in real-time.
- Camera-Based Vision: Identifies objects and provides information by "looking" at them.

Challenges
- Battery Life: Requires frequent charging due to the high power demands of the projector and AI.
- Usability: The novel interaction model has a steep learning curve and can be awkward in public settings.
- Ecosystem: Lacks a mature developer ecosystem for third-party integrations.

Future Roadmap
Humane aims to improve battery life, refine the gesture-based UI, and build a robust platform for developers to create "AI experiences" rather than traditional apps.

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Campus Drive

As part of its robust placement initiatives, Vel Tech University successfully organized multiple campus recruitment drives during the academic year 2023–24. Leading companies including Infosys, DATAMARK, and Salesforce engaged with final-year students through pre-placement talks, interactive sessions, and on-campus interviews.

On 26th March 2024, Infosys conducted a dedicated recruitment drive for B.E./B.Tech. students at the Convocation Hall, providing insights into career growth and company expectations. Earlier, DATAMARK visited on 5th April 2024 to host a pre-placement orientation, creating excitement among students about joining their team. Additionally, on 1st September 2023, under the Tamil Nadu Skill Development Corporation's Naan Mudhalvan Program, Salesforce conducted a placement drive to enhance student employability in the tech sector.

These initiatives reflect the university's continued commitment to bridging academics with industry and empowering students with promising career opportunities.

Preplaccement talk

A pre-placement talk was organized to guide and prepare students for upcoming campus recruitment drives. The session provided insights into company expectations, recruitment processes, interview tips, and career growth opportunities, helping students gain confidence and clarity before appearing for placements.

RABBIT R1

Breakthrough Overview
Unveiled at CES 2024, the Rabbit R1 is a standalone AI device that uses a novel Large Action Model (LAM) to navigate existing app interfaces on your behalf. Instead of APIs, it learns to perform tasks by being "taught" how to use an app.

Technical Specifications
- Large Action Model (LAM): A foundational model that understands user intentions and can operate software interfaces to complete tasks.
- 2.88” Touchscreen: Small display for quick interactions and feedback.
- 360° Camera & Push-to-Talk Button: For vision and voice input.
- MediaTek Helio P35 Processor: Dedicated hardware for running the LAM.

Applications
- Task Automation: Books travel, orders groceries, sends emails, and posts to social media by controlling apps like a human would.
- Teaching Mode: Users can "teach" the device new skills by demonstrating a task once.
- Quick Information Retrieval: Performs web searches and provides answers conversationally.

Challenges
- Reliability: Accuracy is entirely dependent on the LAM's ability to correctly navigate complex and dynamic UIs without breaking.
- Security: Requires handing over credentials to third-party services, raising significant security concerns.
- Device Utility: Questions remain about whether it justifies being a separate device versus a smartphone app.

Future Roadmap
Rabbit's goal is to expand its LAM's capabilities to reliably handle thousands of complex tasks across countless web and mobile applications, creating a universal agent.

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State Level Placement program

On 1st September 2023, Vel Tech Rangarajan Dr. Sagunthala R&D Institute of Science and Technology hosted the Salesforce recruitment drive under the Naan Mudhalvan State Level Placement Program, in collaboration with the Tamil Nadu Skill Development Corporation (TNSDC). The event provided students with a valuable opportunity to showcase their skills and secure placements with one of the top global tech companies.

Campus Drive Infosys

On 26th March 2024, Vel Tech Rangarajan Dr. Sagunthala R&D Institute of Science and Technology warmly welcomed the Infosys recruitment team for a campus drive held at the Convocation Hall. Organized for B.E./B.Tech. students, the event began at 8:30 AM and provided aspiring graduates with a valuable opportunity to pursue career prospects with one of India's leading IT companies.

Technical talk on latest it trends & ideas for innovative projects

The Department of Computer Science and Engineering, School of Computing, Vel Tech, organized a one-day technical event titled "Latest IT Trends and Ideas for Innovative Projects" on 1st March 2024. Mr. Krishnakumar Mahalingam, Executive Director at Prompt CloudCo, served as the resource person and shared valuable insights on emerging IT technologies and their application in innovative student projects. Coordinated by Dr. A. Arunthathi and Ms. K. Nivethitha, the session witnessed active participation from students and faculty in both physical and virtual modes

AGENTIC AI OPERATING SYSTEMS

Breakthrough Overview

Moving beyond single models, 2024-2025 will see the rise of full-stack Agentic AI OSs. These are frameworks that manage multiple specialized AI agents (coder, researcher, designer) that collaborate, access tools (browsers, APIs, IDEs), and autonomously complete complex, multi-day projects from a high-level goal.

Technical Specifications

- Agent Orchestration: Kernel-level scheduler that manages context switching, memory, and inter-agent communication.
- Tool Use API: Standardized protocol for agents to securely access and control software applications, databases, and peripherals.
- Verification & Rollback: Built-in mechanisms to review an agent's proposed actions and revert changes if goals aren't met.

Applications

- Autonomous Software Companies: A single person could act as a "product manager" to an AI OS that handles development, marketing, and deployment.
- Scientific Discovery: AI researchers that formulate hypotheses, design and run simulations, and analyze results without human intervention.
- Personal Life Management: Agents that manage your calendar, finances, and travel end-to-end.

Challenges

- Safety & Alignment: Ensuring a complex system of AI agents remains under human control and faithfully executes intent.
- Security: Preventing malicious actors from using such powerful systems for cyberattacks or misinformation campaigns.
- Computational Cost: The energy and compute required for continuous agent operation are immense.

Future Roadmap

Expect beta releases from major tech companies (Google, OpenAI, Microsoft) and a vibrant open-source ecosystem trying to solve the agent orchestration problem.

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Oracle 19c and Postgres

On 26th February 2024, the Department of Computer Science and Engineering, School of Computing, Vel Tech, organized a one-day hands-on training session on Oracle 19c and Postgres. The session was led by Mr. S. Tamizhiselvan, Engineering Manager at Grozeo Pvt. Ltd., who provided practical insights into modern database technologies. The event enriched students' understanding of enterprise-level database management systems.

Full-stack development using python flask

On 10th February 2024, the Department of Computer Science and Design, Vel Tech, conducted a hands-on boot camp workshop on Full Stack Development using Python Flask. The session was delivered by Mr. RajKumar Rajendran, Senior Software Engineer at Trimble, focusing on backend development and real-time web application building. Students gained practical experience in developing dynamic web solutions using Python Flask.

Electives Taken

Programme Elective Courses

Programme electives enhance domain-specific knowledge and allow students to explore areas of interest in depth. Students can register for electives offered by the department, with a minimum of 6 credits and a maximum of 18 credits throughout the programme.

- ·Up to 18 credits can include one MOOC (SWAYAM/NPTEL) course of 8 weeks (2 credits) or 12 weeks (3 credits) with valid certification and Board of Studies approval.
- ·It is recommended that 3 out of the 18 credits be earned through courses offered by industry or international partners under valid MoU/MoA agreements.

NEUROMORPHIC COMPUTING CHIPS

Breakthrough Overview

Neuromorphic chips (e.g., Intel's Loihi 2) move beyond von Neumann architecture to mimic the brain's neural structure. In 2024-2025, they will transition from research to early commercial applications, offering massive gains in energy efficiency for specific AI tasks like real-time sensory processing and adaptive learning.

Technical Specifications

- Spiking Neural Networks (SNNs): Process information in sparse, event-based "spikes" rather than continuous matrix math, drastically reducing power consumption.
- In-Memory Computing: Eliminates the von Neumann bottleneck by performing computation directly within memory arrays.
- Asynchronous Design: Components operate independently and only power on when they receive a "spike."

Applications

- Edge AI: Enabling powerful, always-on vision and audio AI on smartphones, drones, and IoT devices with tiny batteries.
- Robotics: Providing low-latency, low-power control and sensor fusion for autonomous robots.
- Brain-Computer Interfaces: Ideal architecture for processing real-time neural signals.

Challenges

- Programming Model: Requires a completely new paradigm for software development compared to traditional GPUs/CPUs.
- Precision: Less precise than digital floating-point units, making them unsuitable for some numerical computing tasks.
- Ecosystem: Lack of mature development tools and libraries.

Future Roadmap

Wider availability of cloud-based neuromorphic hardware for developers to experiment with, and the first commercial products featuring dedicated neuromorphic co-processors.

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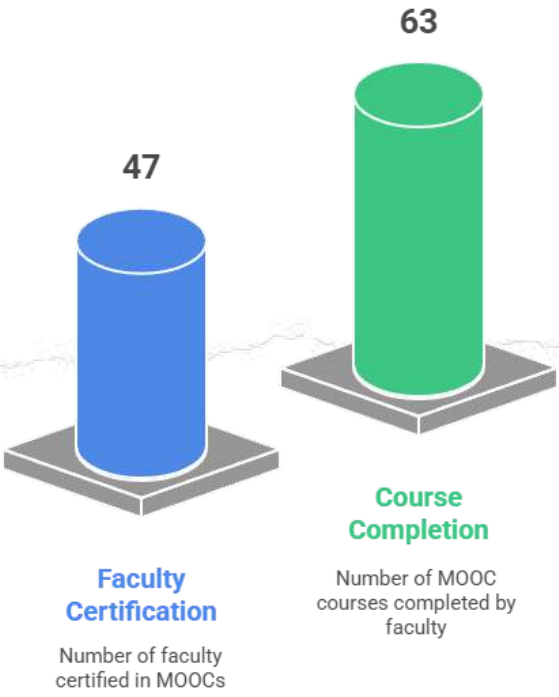
Faculty Certification of MOOCs in 2023-24

In the academic year 2023–24, 47 faculty members at Vel Tech University completed 63 national and international certification courses, reinforcing their dedication to professional growth and academic excellence. This achievement highlights the university's commitment to fostering lifelong learning and global academic standards.



Academic Year Performance

Academic Year	Summer 23-24	Winter 23-24
Registered Count	1760	1418
Certified	1345	965
Successfully completed	951	467
Elite	275	445
Elite+ Silver	89	52
Elite+ Gold	30	1

TRUE 6G PROTOTYPING STANDARDIZATION

Breakthrough Overview

While 5G deployment continues, the foundational research for 6G will solidify in 2024-2025. Prototypes will demonstrate key technologies like sub-Terahertz (THz) frequencies, integrated AI-native networks, and pervasive sensing, setting the stage for a 2030 rollout.

Technical Specifications

- Sub-THz Frequencies: Operating in the 100 GHz to 1 THz range to achieve terabit-per-second speeds.
- AI-Native Air Interface: AI/ML will be used at the physical layer to dynamically optimize coding, modulation, and beamforming in real-time.
- Joint Communication & Sensing: Networks will not only transmit data but also sense the environment, enabling high-resolution imaging and positioning.

Applications

- Wireless Brain-Computer Interfaces: The high throughput and low latency could enable truly wireless, high-bandwidth BCIs.
- Holographic Telepresence: Real-time transmission of lifelike 3D holograms for remote work and social interaction.
- Autonomous Vehicle Networks: Cars will share sensor data and coordinate movements directly via the 6G network.

Challenges

- Physics: Sub-THz signals have extremely short range and are easily blocked by walls, rain, and even leaves.
- Energy Consumption: Generating signals at these frequencies is currently very power-hungry.
- Standardization: A global, multi-year effort to agree on a single standard.

Future Roadmap

Heavy investment in research, the first over-the-air demonstrations of key 6G technologies, and the formation of official working groups for standardization.

The Department of Computer Science and Engineering is proud to announce outstanding placement achievements for the academic year 2023–2024. A total of 476 students were successfully placed across top-tier companies, showcasing the department's commitment to excellence in technical education and career development.

A noteworthy highlight is the remarkable number of **73 students** securing high-paying job offers with annual packages of **₹7 LPA** and above. Among them, the highest offer was extended to Mr. Raghav Rajvanshi and Mr. Sai Srinivas Vara Prasad Korlam, both placed at Cisco with an impressive package of **₹17.90** LPA. Other commendable offers include:

·Mr. Vagicharla Jaswanth at Amadeus Labs with **₹12.60 LPA**
·Mr. Karri Ajay at BNY Mellon with **₹10.63 LPA**
·Mr. Shivam Singh at OpenText with **₹10.00 LPA**

Several students received packages between **₹8–₹10 LPA** from reputed firms such as Genpact, Comcast, and TCS, reflecting the strong industry alignment of our academic programs.

These exceptional outcomes are a testament to the students' hard work, the dedicated mentorship provided by faculty, and the robust support of the placement cell. The department remains committed to nurturing talent and facilitating access to global opportunities through skill enhancement and strategic industry collaboration.

PLACEMENT RECORD

S.No	Company Name	Number of Students Placed
1	TCS	57
2	Genpact	31
3	Atos	27
4	Devtown	25
5	HCL	20
6	Mu Sigma	20
7	Accenture	15
8	SkillForge	13
9	L&T Technology Services	13
10	KodNest	12
11	SmartED	11
12	Academor	11
13	Comcast	9
14	Tech Mahindra	8
15	QSpider	8
16	BNP Paribas	8
17	Capgemini	8
18	Wipro	7
19	Cognizant	6
20	Concentrix	6

S.No	Company Name	Number of Students
21	Yuzhan Technology	6
22	Kalvium	6
23	Fidelity Investments	5
24	Renault Nissan	5
25	ADP	5
26	LTI Mindtree	5
27	Global Quest	5
28	KAAR	5
29	Trane Technologies	4
30	Blend Vidya	4
31	KPMG	3
32	Maveric Systems	3
33	24[7].ai	3
34	Merit Data	3
35	DevTown	2
36	CGI	2
37	EdiGlobe	2
38	Deloitte	2
39	Zoho	2
40	Revature	2

PLACEMENT RECORD CONT...

S.No	Company Name	Number of Students Placed
41	HCl	2
42	Cisco	2
43	IIT Indore	2
44	OpenText	2
45	Mphasis	2
46	Sutherland	1
47	SopraSteria	1
48	Nadconberge	1
49	ITroSys	1
50	Ascendion	1
51	Codtech IT Solutions	1
52	Finisar Technologies	1
53	TransCurators	1
54	V5 tech solutions	1
55	Coronis Ajuba	1
56	Valeo	1
57	Rugged monitorings	1
58	KGIS	1
59	Space Multimedia	1
60	ASC	1

S.No	Company Name	Number of Students Placed
61	Intellect	1
62	Randsand	1
63	Orblike Technologies	1
64	KPO	1
65	Fin Stack Solutions	1
66	Zensar technologies	1
67	Rapport IT	1
68	Cureus technology	1
69	Clogo Ration	1
70	Rochester Solutions	1
71	Temenos	1
72	Geeky works	1
73	Face Prep	1
74	Amadeus Labs	1
75	Accuracy Info Labs	1
76	Payswiff Technologies	1
77	Allsec LTP	1
78	Bambinos.live	1
79	DeltaX	1
80	DeskFactors	1

PLACEMENT RECORD CONT...

S.No	Company Name	Number of Students Placed
81	Consero Global Solutions	1
82	Concentrix	1
83	BNY Mellon	1
84	7 seas entertainment	1
85	Dark Relay	1
86	EPIKInDiFi	1
87	Arete IT	1
88	Emversity	1
89	Daimler	1
90	FNN Technologies	1
91	Cloud Ripples	1
92	Infinit Computer Solutions	1
93	Insightz	1
94	ISAC	1
95	Quasarinsight Labs	1
96	Movit	1
97	V Code Z	1
98	ZF	1
99	Yavar Tech Works	1
100	ZF Commercial Vehicle	1

S.No	Company Name	Number of Students Placed
101	Qbits	1
102	Societe Generale	1
103	IBM	1
104	QiCap	1
105	HPCL	1
106	ICICI	1
107	Ascendion	1
108	Onfocus	1
109	Future Dreams Infarm	1
110	Sopra Steria	1
111	Nokia	1
112	Bellfast	1
113	Free Lancer	1
114	IVIS International	1
115	VIST Software Services	1
116	EPIKINDIFI	1
117	Startek	1
118	Intellipaat	1
119	Infosys	1
120	Tele Performance	1
121	Amazon	1
122	Trisun	1

PLACEMENT RECORD CONT...

ZOHO
Mu Sigma
cisco
Infosys
ADP
TRANE TECHNOLOGIES
SASKEN
#PascalCase
amadeus
micromax
o2h technology
infinite
HCL
cognizant
ignitarium Spark On
BNP PARIBAS
aganitha
RemitBee
w3global
FACE Prep
Hashedin by Deloitte
CGI
movate
UST
Deloitte.
opentext™

PLACEMENT RECORD CONT...

TCS Digital	TCS Ninja	Accenture	ADP India
Atos	BNP Paribas	BNY Mellon	Capgemini
Dellner	Cognizant	CTS (Gen C)	CGI
Cisco	Concentrix	CTS (Gen C)	Tenjact
Deloitte	Deloitte.	EPIKINDFi	Face Prep
Genitar	Baichl	Dell	Hexarar

PHOTONIC (LIGHT-BASED) AI ACCELERATORS

Breakthrough Overview

Photonic computing chips use light (photons) instead of electricity (electrons) to perform calculations. In 2024-2025, we will see the first commercial photonic accelerators designed specifically for AI inference, offering speeds orders of magnitude faster than current GPUs with a fraction of the energy use.

Technical Specifications

- Silicon Photonics: Uses standard silicon fabrication techniques to create optical components like waveguides, modulators, and detectors.
- Matrix Multiplication: Light's inherent properties are perfect for performing the matrix multiplications that dominate neural network computation at incredible speeds.
- Low Latency & Heat: Light generates negligible heat compared to electrical resistance, reducing cooling needs and enabling higher clock speeds.

Applications

- Data Center AI: Drastically reducing the power and cooling costs of massive AI inference workloads.
- High-Frequency Trading: Ultralow latency computation for financial models.
- Scientific Computing: Accelerating complex simulations in physics, chemistry, and climate science.

Challenges

- Precision: Analog photonic computations can be less precise than digital electronic ones.
- Integration: Difficulty in interfacing photonic chips with traditional digital electronic systems (memory, control logic).
- Manufacturing Yield: Producing complex photonic chips at scale with high yield remains challenging.

Future Roadmap

First-generation products will target niche, high-performance computing markets. The goal is eventual integration of photonic compute units into standard AI server racks.

STUDENTS PURSUING HIGHER EDUCATION

The Department of Computer Science and Engineering takes immense pride in celebrating the scholarly aspirations of its students who have chosen to pursue higher studies across diverse domains and institutions, both in India and abroad. For the academic year 2023–2024, an impressive number of over 250 students have embarked on their postgraduate academic journeys, a testament to their academic dedication and the department's strong culture of research orientation and lifelong learning.

Among these meritorious scholars, several students distinguished themselves with exceptional academic records. Notably, Thotakura Swathi Prathyusha achieved a CGPA of 9.53, followed by Vengala Geetha Charan with 9.33, Veeramachaneni Mounika with 9.25, and Sreyaaw Tallapragada and Maddineni Lakshmi Sindhu with CGPAs of 9.25 and 9.16, respectively. These outstanding performers exemplify the department's commitment to nurturing academic excellence and research-driven learning environments.

Whether advancing into cutting-edge specializations, contributing to global research, or preparing for competitive examinations, these students reflect the academic rigor, mentorship, and support systems embedded within the department. Their achievements serve as an inspiration for future cohorts and reinforce the department's standing as a launchpad for higher academic pursuits.

STUDENTS PURSUING HIGHER EDUCATION

Vtu No	cgpa	Name
11356	9.153846	SARANRAJ S
11465	8.767857	VELAGAPUDI ABHINANDHAN
11476	7.571429	NANDIMANDALAM NIRANJAN VARMA
11477	8.035714	VATTEM VENKATESH
11497	8.37037	GUTHA MOUNIKA
11500	9.089286	MAKINENI KOUSHIK KUMAR
11553	8.438596	GUDDURU RAKESH
11561	8.740741	CHITHALA SAI BHARGAVI
11803	8.703125	SURAJ VAN VERMA
11827	8.482143	SHEENURI RAVI
11828	8.872727	CHINTALAPELLI ANKITH REDDY
11842	7.946429	GANGIREDDY YASHASWINI
11855	8.309091	YALLAVULA SAI PRAKASH
11884	7.910714	SAHIL QURESHI
12612	7.839286	SHAIK KAFIL AHMAD
12638	8.109091	KANCHARLAPALLI VENKATESH
12658	8.092593	GALI KRISHNA CHAITANYA
12666	8.375	NALLABOTHULA VENKATA SAI KRISHNA

STUDENTS PURSUING HIGHER EDUCATION

Vtu No	cgpa	Name
12667	8.232143	CHILUKURI RAHUL SIDHARDHA
12707	8.87037	BALINENI VENKATA KRISHNA
12715	8.942308	POTHINA BHUVAN CHANDAR
12725	8.321429	KANDA ANIL KUMAR
12727	8.054545	CHINTHALAPALLI MAHENDER REDDY
13021	8.714286	GENIKALA ARUN CHANDU
13122	8.357143	BADE BADHRI NADH
13268	8.285714	NUNNA VENKATA SATYA NARAYANA
13269	7.740741	SHAIK IMTIAZ
13284	9.333333	VENGALA GEETHA CHARAN
13293	7.910714	YEDUNUTHULA ROHITH REDDY
13297	8.763636	PORANKI SAI SESHA VARMA
13310	7.981818	JAGARLAMUDI SAI KRISHNA
13311	7.909091	SANGANA VENKATA MANOJ KUMAR REDDY
13435	7.857143	CHIRUMAMILLA RAVI TEJA
13436	8.055556	BHASKAR PATI
13460	8.4	SANKURTHI HARISH
13469	8.148148	GOLI SAI CHARAN REDDY
13473	6.925926	MANAVARTHI JAYASHREE

STUDENTS PURSUING HIGHER EDUCATION

Vtu No	cgpa	Name
13491	7.981818	YARRAGUNTLA JYOSHNA
13525	7.163636	NAGAKRISHNA DEVABATHINI
13526	7.098039	KADICHERLA VADLA KOUSHIK
13550	8.890909	KANAGALA SAI DEEPAK
13553	7.375	MOGILICHARLA GOPIKRISHNA
13673	8.245283	MUPPINENI AJAY KRISHNA
13676	8.259259	V S PRADEEP
13692	8.075472	PUCHHALA MAHESH REDDY
13701	9.535714	THOTAKURA SWATHI PRATHYUSHA
13735	8.581818	PAREDDY LOKESH REDDY
13737	8.018182	SY MAHUMMAD ALEEM PEERAN
13747	8.425926	VADLAMUDI MAHENDRA
13780	9.25	SREYAAW TALLAPRAGADA
13781	8.071429	UNNAGIRI SIVA NARAYANA
13815	8.964286	YARLAGADDA PAVANI
13819	8.444444	GAMIDI SRIMANI KUMAR
13824	8.381818	NELAVALLI SANDEEP
13861	8.296296	BELLAM MOULYA
13886	8.169811	BONAM VENKATA SRI SAI KANAKA RAJU
14079	9	RAJULAPATI NIRANJAN SAI
14080	8.232143	DUGGIRALA MOHITH

STUDENTS PURSUING HIGHER EDUCATION

Vtu No	cgpa	Name
14149	8.836364	KALAKOTA FANINDER REDDY
14152	8.181818	YERUVA SAGAR VINOD REDDY
14159	9.037037	MANDAVA LIKHITHA VENKATA PAVANI
14163	8.055556	NALLURI VINAY
14200	8.214286	POPURI NIKHIL SAI
14314	8.403509	YADLA RAVITEJA
14465	8.018519	NALABOLU THARUN
14473	8.074074	PADAMATA HEMANT KUMAR
14477	9.188679	BANDI SIVA PRASAD REDDY
14481	8.035714	BOMMAREDDY VIVEKREDDY
14484	7.927273	KARLAPUDI PRAVEEN
14485	8.527273	VALLURU VENKATA RAHUL
14486	8.537037	VEGINETI SWATHI
14488	8.2	MOPARTHI SAI ASHRITHA
14490	8.907407	BODDU VENKATA SUBHA SRI
14491	9.12963	RAVIPATI SRILAKSHMI
14494	8	KANNETI SAISUNIL
14498	4.615385	VOTLA VARUN JOSHI
14507	5.672727	YAMSANI KOUSHIK
14510	7.58	MUNDRU SADA SIVA SUBRMANYAM
14521	8.631579	MUPPUDI NITHISH KUMAR REDDY
14523	8	MUTHAVARAPU PARAMESWARA TEJA
14611	8.481481	SONTI SIVA NAGA VENKATA VARA PRASAD
14676	7.54386	PABBISETTI YOGESH
14677	9.267857	P HEMANTH KUMAR

STUDENTS PURSUING HIGHER EDUCATION

15219	8.872727	THIPPARTHI JAYANTH REDDY
15232	8.357143	NALLAPU SAI SHASHANK VARMA
15244	8.673077	DOOSARI AKHIL TEJA
15245	8.035714	MAMILLAPALLI HIMAVANTH SAI
15250	8.821429	BOBBILI SAI KISHORE REDDY
15257	7.636364	PALNATI HARISHIVA REDDY
15275	7.5	PUCHALA PRAVEEN KUMAR REDDY
15284	8.818182	KANDUKURI AJAYCHARY
15286	9.185185	THANGELLA VENKAT
15287	7.714286	VANGALA YESHWANTH REDDY
15288	8.4	MATTA HARISH GOUD
15294	8.436364	K KARTHIK KUMAR REDDY
15301	8.357143	VANGALA SRAVYA
15303	7.982143	MALLEBOINA BHUVANESHWAR
15308	6.685185	DULAM SAI TEJA
15321	7.625	K SAI KIRAN
15423	7.482143	KOTNI INDRA PAVAN
15446	7.25	ALLI HEMANTH SAI
15509	9.163636	CHERUKURI AKASH
15535	7.803571	JANGALA SAI KUMAR
15614	8.2	CHICHARI RAJESH
15646	8.109091	YANAMADALA JAGADEESWARI
15655	8.381818	BOLLA JAWAHAR SRI VEERA SAI SURAJ

STUDENTS PURSUING HIGHER EDUCATION

14780	8.089286	BANKA KUSWANTH KUMAR
14786	6.188679	KOSANAM RAJASEKHAR NETHA
14806	8.163636	REDDAM SUMANTH REDDY
14819	8.508772	KANCHARAPALLI VARIJ VENKATA VITESH
14851	8.490909	PAIDIPATI VEERENDRA
14856	8.309091	MEDAKA SAI NAGENDRA PAVAN KALYAN
14857	8.236364	KOLLOJU DIVYA GAYATHRI
14863	8.785714	JAMMULA CHAITHANYA
14864	8.396226	GULLAPALLI VENKATESH
14880	7.982143	MAREEDU LOKESH THAMBI
14962	7.982143	CHAMIDISETTY KIRAN KUMAR
14966	9.160714	MADDINENI LAKSHMI SINDHU
14975	7.6	YARLAGADDA HARISH BABU
14979	7.964286	SANDU PRIYANKA
15018	9	SAYINA VEERA VENKATA SATYA SAI
15058	8.092593	GADIPARTHI SRIRAM MANIKANTA
15062	7.642857	KARNATI SAI KIRAN
15154	8.909091	BANDARUPALLI LOHITHA
15204	8.75	POTU GOWTHAM KRISHNA
15210	8.109091	THEELETI SREEHARSHA REDDY
15211	8.339286	NALAMOTHU NAVEEN
15214	8.875	MAREDDY NAVEEN REDDY
15216	7.722222	CHANAGANI SUNNY

STUDENTS PURSUING HIGHER EDUCATION

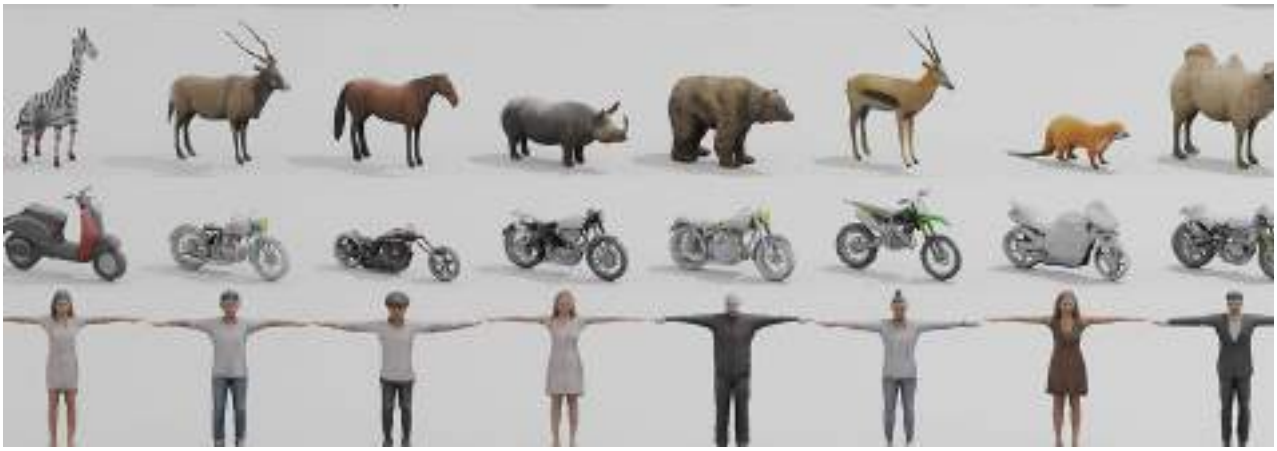
15661	7.527273	METLA SIVA PRASAD
15671	8.654545	DODDAPANENI LOKA PAVANI
15691	9.12963	ALLA NAGA LOKESH SAI
15725	6.962963	VELURU RAJESH
15741	7.571429	KOMALI SUNEEL KUMAR
15794	7.716981	K SHASHANK
15854	8.618182	YEDDULA REDDY KRISHNA REDDY
15900	8.642857	BATTINA CHENGAL REDDY
15945	9.125	YANAMANDHALLA SWETHA
15956	8.327273	CHINTHAPARTHI NAGA DINESH
11901	8.696429	DIRISINALA NAGA JYOTHI
12639	8.321429	TUBATI PAVAN KUMAR
13380	9.254545	VEERAMACHANENI MOUNIKA
13446	8.169811	YELUGURI PAVAN
13658	8.607143	SADINENI MOHANA VYSHNAVI
14076	6.166667	KATTA RAHUL PRANAY
14483	7.785714	KARANAM RAGHAVENDRA
14500	6.763636	VUTLA LOKESH
14501	8.75	DASARI SIVA VENKATA KRISHNA
14506	8.592593	THUMMALAPALLI NIKHIL CHOWDARY
14872	7.692308	VEMI REDDY KRISHNA KOWSHIK REDDY
15152	5.981481	KONDRU SUNIL KUMAR
15263	8.296296	NAALLA SUMANTH
15292	7.169811	JETTY RAVINDAR REDDY
15524	8.553571	CHITTALA SATYA PRASAD
15647	8.418182	PENDYALA NISHANTH

STUDENTS PURSUING HIGHER EDUCATION

18905	8.62963	KAKUNURI RAVINDAR REDDY
10932	7.966667	LEELAVATHI M
18868	7.7	VASANTHA BALAJI G
13803	8.877551	YARAMALA TARUNKUMAR REDDY
13943	8.890909	VADLAPATLA DHARMA SATISH

AWARDS AND PRIZES
STAFF AWARDS AND RECOGNITIONS

A prestigious awards ceremony recognizing exceptional achievements in publications, funded research projects, consultancy endeavors, and patents was held on 24th June 2023 at the ECE Gallery Hall. The event was graced by the esteemed presence of Prof. B. S. Murthy from the Indian Institute of Technology, Hyderabad, who attended as the Chief Guest. The ceremony served as a platform to celebrate and honor the remarkable contributions of faculty members and researchers in advancing knowledge, fostering innovation, and promoting academic excellence through their dedicated efforts in research and consultancy.



GENERATIVE AI FOR 3D ASSETS

Breakthrough Overview

Following 2D image and video generation, 2024-2025 will be the breakout period for generative 3D AI. Models will create high-fidelity, game-ready 3D models, textures, and entire virtual environments from text or image prompts, democratizing 3D content creation.

Technical Specifications

- Neural Radiance Fields (NeRFs)/3D Gaussians: AI techniques that create photorealistic 3D scenes from a set of 2D images.
- Text-to-3D Models: End-to-end generation of 3D meshes with proper topology, UV maps, and PBR (Physically Based Rendering) materials from a text description.
- Physics Integration: Generated worlds will include realistic physical properties by default.

Applications

- Game Development: Rapid prototyping and creation of assets, characters, and levels.
- Architecture & Metaverse: Instantly generating and iterating on architectural visualizations and virtual spaces.
- Robotics Simulation: Creating vast and diverse simulated environments for training reinforcement learning algorithms.

Challenges

- Computational Cost: Training and running these models is extremely intensive.
- Control & Editing: Fine-grained control over the generated output is still difficult.
- Artistic Cohesion: Ensuring a generated world has a consistent artistic style.

Future Roadmap

Tight integration into major game engines (Unreal, Unity) and 3D software (Blender, Maya), making AI-generated 3D a standard tool in every creator's workflow.

DEPARTMENTAL RESEARCH EXCELLENCE

In the first four months of 2024, the department has already contributed to over 100 scholarly publications, establishing a robust trajectory for annual research output.

Key Contributions:

- Innovative research on federated learning, quantum computing, medical image processing, and autonomous systems was presented at international IEEE conferences and published in high-impact journals.
- Noteworthy contributions to Nature Research, Springer Nature, IEEE Access, CRC Press, and MDPI journals.
- Faculty showcased advancements in:

·Smart agriculture using IoT and ML
·AI-driven healthcare monitoring and diagnostics
·Energy-efficient infrastructure using reinforcement learning
·Cybersecurity in cloud and SDN environments

Top Publisher Recognition **(Jan–Apr 2024)**:
·IEEE (Institute of Electrical and Electronics Engineers) was the leading publisher in this quarter, accounting for more than 40% of all publications, including journal articles and international conference papers.

·**386** Research Articles Presented in Conferences
·**83** Book Chapters Published in Leading Academic Volumes
·**242** Research Articles Published in Reputed Journals
These publications span prestigious outlets such as Springer Nature **(47)**, Elsevier **(21)**, Nature Research **(13)**, Taylor and Francis **(12)**, and MDPI **(4)**, among others. This scholarly output not only enriches the scientific community but also reaffirms our institution's commitment to innovation and research excellence.

CONSOLIDATED TABLE OF JOURNAL PUBLICATIONS (JAN–APR 2024)

Publisher / Journal	No. of Publications
Springer Nature	**47**
Elsevier	**21**
Nature Research	**13**
Taylor and Francis Ltd.	**12**

CONSOLIDATED TABLE OF JOURNAL PUBLICATIONS (JAN–APR 2024)

Collegium Basilea	8
Seventh Sense Research Group	7
John Wiley and Sons Inc	6
Ismail Saritas	6
European Alliance for Innovation	6
Inderscience Publishers	5
American Scientific Publishing Group	5
World Scientific	5
MDPI (Multidisciplinary Digital Publishing Institute)	4
Iquz Galaxy Publisher	4
International Publications	4
IEEE (Institute of Electrical and Electronics Engineers Inc.)	4
IFEES (International Federation of Engineering Ed. Societies)	4
Intelligent Network and Systems Society	3
Institute of Advanced Engineering and Science	3
AnaPub Publications	3
Science and Information Organization	3
Semarak Ilmu Publishing	3
BioMed Central Ltd	3
Wiley Hindawi Limited	3
King Saud University	3

CONSOLIDATED TABLE OF JOURNAL PUBLICATIONS (JAN–APR 2024)

Forex Publication	**2**
Global NEST	**2**
Frontier Scientific Publishing	**2**
IOS Press BV	**2**
Walter de Gruyter GmbH	**2**
West University of Timisoara	**2**
Learning Gate	**2**
Asian Research Association	**2**
Murat Yakar	**2**
Academic Press	**2**
Remaining Publishers (each with 1 publication)	**44**
Total	**242**

STUDENT AWARDS AND RECOGNITIONS

We are proud to highlight the exceptional achievements of our students in prestigious national fellowship programs. Mr. Pratyush De and Mr. Dipta Talukder, under the mentorship of Dr. N. Malarvizhli, were awarded the Chanakya Fellowship Grant on 4th June 2023, securing a national-level grant of ₹1 lakh each in recognition of their outstanding potential and academic excellence. Additionally, Mr. Pratyush De, guided by Mrs. T. Kujani, showcased his active engagement in research and innovation through his participation in the Chanakya UG Fellowship held on 9th May 2023. These accomplishments underscore the department's commitment to fostering scholarly excellence and encouraging students to explore impactful opportunities at the national level.

Vtu.No	Name	Mentor Name	Event Name	Date	Cash Prize	State/Nationa
12070	PRATYUSH DE	Dr.N.Malarvizhli	CHANAKYA FELLOWSHIP PROGRAM	04-06-2023	1 lakh Grant Fellowship	National
28596	DIPTA TALUKDER	Dr.N.Malarvizhli	CHANAKYA FELLOWSHIP PROGRAM	04-06-2023	1 lakh Grant Fellowship	National
12070	PRATYUSH DE	Mrs.T.Kujani	CHANAKYA UG Fellowship	09-05-2023	Participated	National

BRAIN-COMPUTER INTERFACES FOR MEDICAL TREATMENT

Breakthrough Overview

Following Neuralink's first-in-human trial, 2024-2025 will see an expansion of BCIs from read-only to write-capable devices for therapeutic purposes. This involves not just interpreting neural signals but also modulating brain activity to treat conditions like depression, PTSD, or Alzheimer's.

Technical Specifications

- Closed-Loop Systems: Devices that read neural activity, process it with an onboard AI, and then deliver targeted electrical or ultrasonic stimulation to correct aberrant patterns in real-time.
- Focused Ultrasound Neuromodulation: A less invasive technique for stimulating deep brain regions without surgery.
- Personalized Neural Signatures: AI will identify individual-specific brain patterns associated with disease symptoms.

Applications

- Treating Mental Health: Regulating activity in brain circuits linked to depression, anxiety, and OCD.
- Restoring Memory: Stimulating hippocampal activity to slow or reverse memory loss in Alzheimer's patients.
- Stroke Rehabilitation: Re-mapping motor cortex activity to regain movement after a stroke.

Challenges

- Ethical Concerns: "Editing" a person's mood or personality raises profound ethical questions about identity and autonomy.
- Long-Term Effects: The long-term impact of continuous neural stimulation is unknown.
- Precision: Achieving the exact level of modulation required without causing side effects is extremely difficult.

Future Roadmap

Clinical trials will expand for various neurological and psychiatric conditions. We will see the first FDA approvals for AI-driven, closed-loop neuromodulation devices.

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