CINTELASSOCIATION

DEPARTMENT OF CINTEL
Software that can think

SRM
INSTITUTE OF SCIENCE & TECHNOLOGY
(Deemed to be University u/s 3 of UGC Act, 1956)

School of Computing

JAN
2024

COLOSSAL

VOLUME 03
ISSUE 02

THE DEPARTMENT OF COMPUTATIONAL INTELLIGENCE

Editor's Voice

"In the end, it's not the years in your life that count. It's the life in your years." -*Abraham Lincoln*

Dear Allies!

Sanctified New Year 2024 to All. The Secrets of this year would be Enthusiastic!!!

What is intelligence? How did it begin and evolve to human intelligence? Does a high level of biological intelligence require a complex brain? Can man-made machines be truly intelligent? After systematically reviewing biological and computational underpinnings of decision making and intelligent behaviors, Birth of Intelligence proposes that true intelligence requires life.

Intelligence is the ability to find solutions to complex problems a life faces in a complex and uncertain environment. This cannot be captured by a standardized numerical score, such as IQ, that focuses on a narrow range of cognitive capabilities, such as working memory or verbal fluency. The definition of intelligence and how the nervous system works, the simple behavior of reflexes and the limitations of reflexes, connectome - the comprehensive map of all the connections in an animal's nervous system, the multiple controllers for muscles, and the social nature of many behaviors are the mysteries of God.

To better prepare for the future society in which artificial intelligences (AI) will have much more pervasive influence on our lives, a better understanding of the difference between AI and human intelligence is necessary. Human and biological intelligence cannot be separated from the process of self-replication. Therefore, a fundamental gap exists between human intelligence and AI until AI acquires artificial life. Humans' social and metacognitive intelligence most clearly distinguish human intelligence from nonhuman intelligence. Although advances are likely to improve the functioning of AI, AI will remain a function of human activity. However, if AI can learn to self-replicate and thus become a life form, albeit a man-made one, outcomes become uncertain.

The Department of Computational Intelligence intelligently concentrates on Natural Language Processing, Computer Vision, Music and Creativity, Recommendation Systems, Healthcare, Gaming and Simulation. The Dawn of AI: Birth of Machine Learning, Resurgence of Neural Networks: A Technological Renaissance, The Spark of Creativity: Enter Generative Adversarial Networks (GANs).

Transforming Language: The Rise of Transformer Models, From StyleGAN to DALL·E: Expanding GENAI's Universe and what not. The Department strives hard and dedicatedly work in all these above domains in preparing our faculty and students to swim in the next era of AI Ocean through various technical and non-technical activities.

Have a glimpse on Colossal and catch us with your attention to do better in the next periodical issue.

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"The only impossible journey is the one you never begin." -Tony Robbins

Stay in Watch! Movies have some Matter!

B.Amutha
SCO-Newsletter Head

B.AMUTHA

MRS.C.G.ANUPAMA

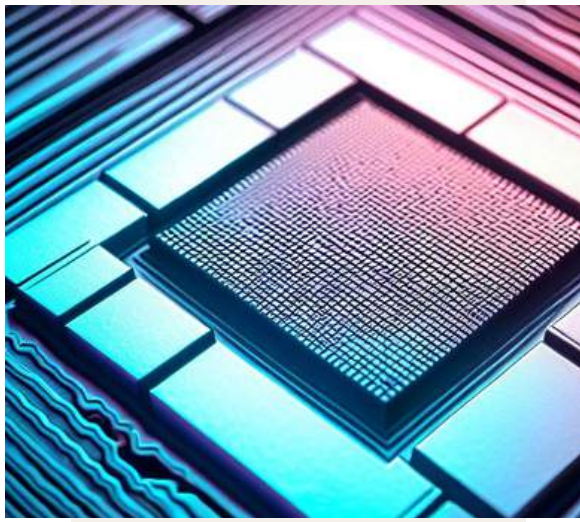
DR. ARUN C

DR. ANITHA D

COLOSSAL

INSIDE THE ISSUE

ROLE OF HPC IN PANDEMIC RESPONSE AND RESEARCH

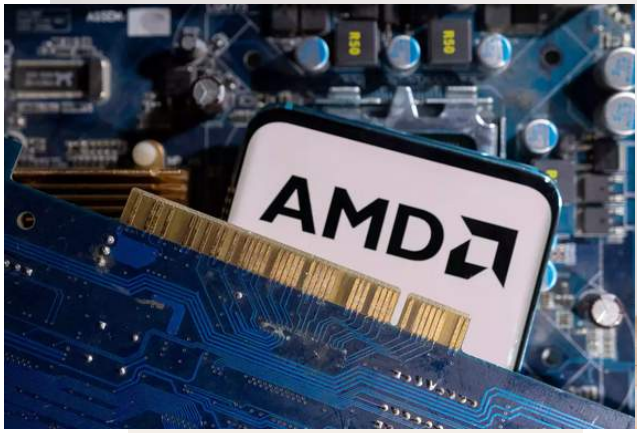


In the shadow of global health crises, the role of high-performance computing (HPC) in pandemic response and research emerges as a beacon of hope, illuminating the path toward understanding, mitigating, and ultimately overcoming such formidable challenges. As pandemics unfold with devastating swiftness, the deployment of HPC resources becomes a critical component in the arsenal of scientific tools aimed at curtailing the spread of infectious diseases and hastening the development of therapeutic interventions and vaccines.

At the vanguard of this effort, HPC facilitates the analysis of vast datasets at speeds unimaginable for conventional computing methods. This capability is instrumental in decoding the genetic makeup of pathogens, a task that lays the groundwork for a myriad of research initiatives. By unraveling the genomic sequences of viruses with alacrity, scientists can identify potential targets for drug development and vaccine formulation, an endeavor where time saved equates to lives spared.

Moreover, HPC's computational might is pivotal in modeling the dynamics of pandemics. Through sophisticated simulations, researchers can forecast the spread of infections across populations and geographies, taking into account variables as diverse as human behavior, transportation patterns, and intervention strategies. These models serve as invaluable tools for public health officials and policymakers, offering insights that guide decision-making processes related to lockdown measures, social distancing guidelines, and the allocation of healthcare resources. Such predictive analytics, powered by HPC, enable a proactive rather than reactive approach to pandemic management, potentially flattening the curves of infection and mitigating the impact on society.

Beyond the realm of epidemiology, HPC contributes significantly to the field of structural biology through molecular dynamics simulations. These simulations allow scientists to visualize the interaction between viral proteins and potential pharmaceutical compounds at an atomic level, expediting the drug discovery process. The ability to screen thousands of molecules for therapeutic efficacy in silico before proceeding to clinical trials is a testament to the transformative power of HPC in accelerating the journey from laboratory bench to bedside.



Furthermore, HPC plays a crucial role in the analysis of public health data, enabling the integration and interpretation of information from diverse sources, including electronic health records, social media, and mobile devices. This holistic view of data assists in identifying outbreak hotspots, understanding transmission pathways, and evaluating the effectiveness of intervention measures. In this context, HPC acts as a linchpin in the establishment of a data-driven response strategy, ensuring that interventions are tailored to the evolving landscape of the pandemic.

The integration of artificial intelligence (AI) and machine learning (ML) algorithms with HPC infrastructure further enhances the capacity to sift through, analyze, and derive actionable insights from data at an unprecedented scale and speed. AI-driven models, trained on datasets of infection rates, population demographics, and health outcomes, can predict future trends with a degree of accuracy previously deemed unattainable. This synergy between AI, ML, and HPC opens new vistas in pandemic forecasting, surveillance, and response.

In conclusion, the role of HPC in pandemic response and research is multifaceted and profound. It accelerates scientific discovery, informs public health strategies, and facilitates the development of medical countermeasures. As the world grapples with the challenges posed by pandemics, the strategic deployment of HPC resources stands as a testament to the indomitable spirit of human ingenuity and resilience. In this concerted effort against invisible adversaries, HPC is not merely a tool but a catalyst for hope, driving forward the global endeavor to safeguard humanity's health and well-being.

STUDENT ACHIEVEMENTS

- VASHIST AGARWALLA, SECURED AN INTERNSHIP AS A SOFTWARE AUTOMATION ENGINEER INTERN AT APPLE, IRELAND.

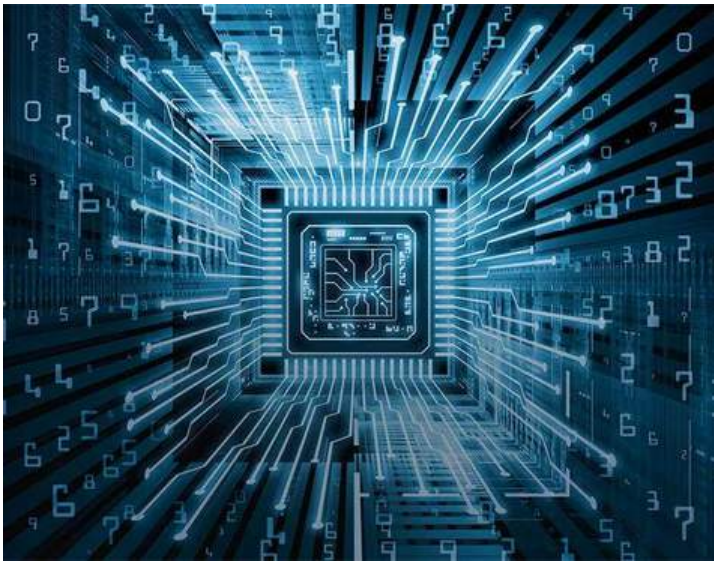
- DIVYA SINGH GOT AN INTERN - SDE AT JUNGLEE GAMES INDIA PVT. LTD AT A PACKAGE OF 23 LPA

- VARMA RECEIVED A TOPPER STAMP IN NPTEL JAVA COURSE(ELITE)

- PURVI WASAN IN THE EVENT DOCMUN IN CHRIST UNIVERSITY, BANGALORE 2023- SECURED 3RD POSITION AND GOT SRM BEST UNIVERSITY DELEGATION AWARD. PERSONALLY, SHE GOT AN HONOURABLE MENTION AWARD AND CONTRIBUTED IN GETTING THE BEST DELEGATION AWARD TO SRM.

- Samudra Banerjee and Sewetanshu Agarwal, from SRM IST's CINTEL, presented "Predicting Average Tomato Prices Using Support Vector Machine with Polynomial Features" at ICSCAN 2023 and were finalists at IIT Bombay Techfest, demonstrating their innovative talent in research and development.

INNOVATIONS IN HPC



Direct-to-Chip Liquid Cooling: Augmenting the repertoire of cooling strategies, direct-to-chip liquid cooling technology targets the heat at its source by channeling coolants directly onto the CPU, GPU, or other heat-generating components. This direct approach ensures rapid and efficient heat transfer, significantly mitigating the thermal resistance often encountered in traditional cooling methods.

The relentless pursuit of computational prowess within the domain of high-performance computing (HPC) has invariably precipitated an escalation in thermal outputs, engendering a critical imperative for innovative cooling technologies. This paradigm shift toward supercomputers that use a lot of energy means that cooling methods need to be reevaluated and rethought in order to deal with the problems that come with higher processing speeds. Innovations in HPC cooling technologies are thus pivotal, not merely for enhancing the operational efficiency and sustainability of these computational behemoths but also for paving the pathway towards the next frontier of exascale computing.

Liquid Immersion Cooling: A vanguard among these innovations is liquid immersion cooling, a technique that eschews traditional air-cooled systems in favor of immersing components directly in a dielectric liquid. This liquid, possessing superior thermal conductivity properties compared to air, facilitates more efficacious heat extraction from the components, thereby substantially reducing cooling energy consumption. In addition to its immediate benefits in controlling temperature, liquid immersion cooling also reduces the system's acoustic footprint and gets rid of the need for large heat sinks and noisy ventilation systems, creating a smaller and quieter working environment.

Moreover, by utilizing water or other environmentally benign coolants, direct-to-chip cooling not only exemplifies an advancement in thermal management but also underscores a commitment to ecological sustainability.

Rear Door Heat Exchangers: The integration of rear door heat exchangers into HPC infrastructures exemplifies an innovative approach to augmenting traditional air cooling methodologies. By affixing a heat exchanger to the rear door of server racks, the exhaust heat is immediately captured and expelled, significantly improving the overall cooling efficiency. This method not only enhances the thermal management of HPC systems but also contributes to a more uniform temperature distribution within the data center, reducing the likelihood of hotspots and ensuring a more stable operational environment.

In conclusion, the need for more effective and energy-efficient cooling technologies is driving a significant transformation in the HPC landscape. As the computational demands of scientific research, data analysis, and technological development continue to ascend, innovations in cooling technologies not only serve as a bulwark against the thermal challenges of today but also as a catalyst for the computational achievements of tomorrow. Through the continuous exploration and implementation of advanced cooling solutions, the HPC community stands on the cusp of unlocking new realms of computational capability, all while stewarding the principles of environmental sustainability and energy efficiency.

Phase Change Cooling: Another frontier in HPC cooling innovation is phase change cooling, which leverages the latent heat of vaporization to dissipate heat from critical components. This technology involves the circulation of a working fluid that absorbs heat and transitions from a liquid to a gas phase. The gaseous fluid, upon condensing back to a liquid, releases the absorbed heat outside the system, thereby effecting a cyclical cooling mechanism. Phase-change cooling systems, with their capacity to handle high heat fluxes, offer a promising solution for sustaining the performance of HPC systems under the duress of intensive computational loads.

DR. ARUN C

FACULTY ACHIEVEMENTS

- Dr.Vimaladevi M completed Certified Instructor - ServiceNow-CIP (Certified Instructor Program) for Application Development Fundamentals.

- Dr.A.Revathi, Dr.B.Pitchai Manicka, Dr.Sheryl Oliver, Dr.Antony Sophia N gained Elite Silver Certification in NPTEL course.

- Dr N Arivazhagan has posted as Additional Controller. Hearty congratulations and all the best for his future endeavours

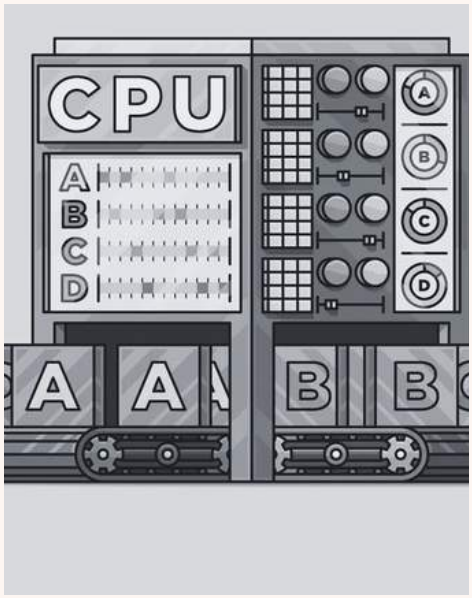
- Congratulations Mrs. Anupama C G for receiving the Global Education Champions Award 2023-2024👏👏👏

PARALLEL PROGRAMMING
CHANGING THE FUTURE

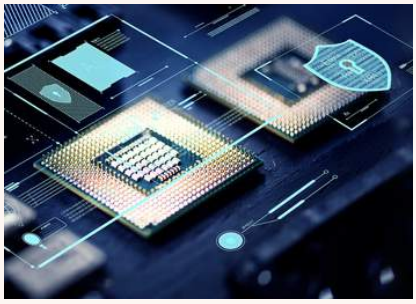
Parallel Programming with CUDA

In the intricate tapestry of modern computational science, parallel programming with CUDA represents a pivotal thread, interwoven with the pursuit of unprecedented computational throughput and efficiency. NVIDIA's architectural marvel CUDA (Compute Unified Device Architecture) is a shining example of innovation because it allows for the meticulous harnessing of Graphics Processing Units (GPUs) for a variety of tasks that go beyond simple graphical computation. This article endeavors to explore the nuances of parallel programming with CUDA, shedding light on its profound implications for computational paradigms and the broader vistas it opens for research and development across diverse scientific domains.

CUDA's genesis is rooted in the recognition of GPUs as vastly underutilized resources capable of far more than the rendering of graphics. With its advent, CUDA has metamorphosed the GPU into a crucible for high-performance computing, offering a pantheon of tools, libraries, and direct hardware access mechanisms designed to exploit the parallelism inherent in GPUs. At its core, CUDA facilitates the crafting of software that can operate across hundreds or thousands of cores simultaneously, a feat that traditional CPU-bound programming paradigms struggle to match in scale and efficiency.

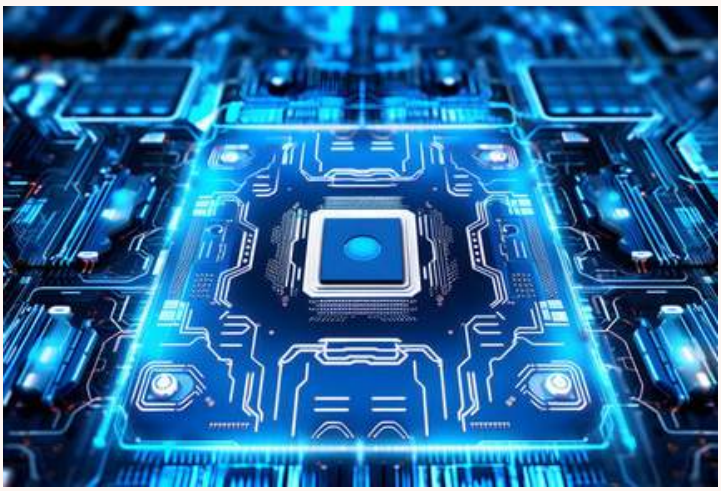


Compute Unified Device Architecture



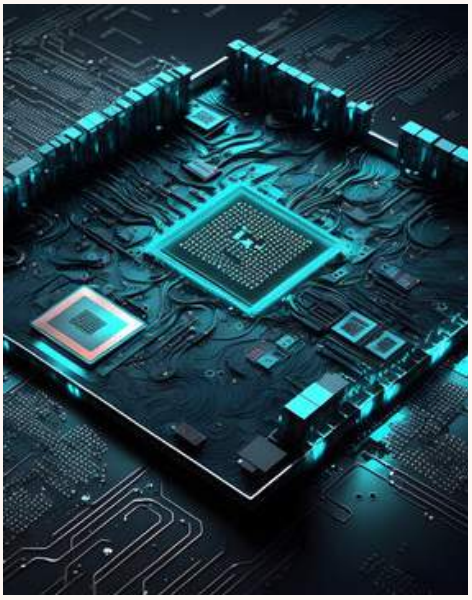
Beginning parallel programming with CUDA is comparable to orchestrating a symphony; each thread of execution plays its part in harmony under the developer's hand to produce a collective performance that is both exquisite and powerful.

ELEGENCE OF CUDA AND MASTERING THEM



The CUDA model divides the GPU into a hierarchy of grids, blocks, and threads, allowing for the meticulous organization of parallel tasks according to their nature and interdependencies. Such a structure enables the programmer to finely tune the distribution of computational workloads, optimizing for throughput and minimizing latency, thereby unlocking the latent potential within the GPU.

The elegance of CUDA lies not only in its technical prowess but also in its democratization of parallel computing. By providing an accessible platform for the development of parallel applications, CUDA has catalyzed a renaissance in computational thinking, encouraging the exploration of novel algorithms and methodologies optimized for parallel execution. From the realms of artificial intelligence and machine learning to the frontiers of quantum mechanics and climate modeling, CUDA has become synonymous with high-impact research and innovation, driving forward the boundaries of human knowledge.



However, the path to mastering parallel programming with CUDA is beset with intellectual challenges. It demands a paradigmatic shift in thought, a deep understanding of parallel architectures, and a nuanced appreciation of the complexities of synchronization, memory hierarchy, and data locality. The pursuit of optimal performance necessitates an iterative process of refinement, profiling, and optimization, a journey that is as demanding as it is rewarding. conclusion, parallel programming with CUDA embodies a transformative force in the landscape of high-performance computing. It offers a lens through which the computational challenges of today can be re-envisioned as opportunities for breakthroughs, fostering an environment where the limits of what is computationally feasible are continually expanded. As we delve deeper into the era of data-intensive science and complex computational problems,

CUDA stands as a testament to human ingenuity, a tool that not only enhances our computational capabilities but also enriches our understanding of the universe and our place within it. In this grand endeavor, CUDA is not merely a technology; it is a catalyst for discovery, a bridge to future innovations, and a testament to the enduring power of parallelism in unlocking the mysteries of the cosmos

DR. ANITHA D

EVENTS

Capacity Development with Ethical Considerations and Skills Development:

From 9th to 14th October,2023, the CINTEL Department conducted a workshop on Capacity Development with Ethical Considerations and Skills Development.The chief guests and guest speakers included Ms.Thulasi Manogaran, CEO of Giant Leap,Mr.Nandhakumar, Wellness Mentor Consulting,Dr.Pangajam P, Associate Professor, Department of Clinical Phycology, SRM Medical College Hospital & Research, Mr. NM Rangesh, Aradhya Wellness Centre,and Mr.Sajeev Menon, International Trainor, Art of Living .The workshop mainly focused on “Where ethics meets progress: Navigating the tightrope between skill development and responsible innovation.”

Upskilling Career from Developer to Full Stack Developer:

From August 9–11, 2023, the CINTEL Department, hosted a 3 day program titled "Upskilling Career from Developer to Full Stack Development”. The key workshop highlights included :In-depth exploration of Full Stack Development principles and methodologies, hands-on training with the latest technologies used in Full Stack Development, expert-led sessions and interactive discussions with experienced industry professionals, and networking opportunities. The sessions were handled by Sakthivel E, Lead Engineer – Development, FIS Global Business Solutions India Pvt. Ltd.,Chennai,and Mrs. Vishnupriya, Sr. Full Stack Developer at Vistaconvert(CRM), Chennai, India.

Machine Learning using Python

The CINTEL department conducted a six days Faculty Development Program, on "Machine Learning using Python" on 04th- 09th Decemenr,2023.The Resources Person from various central universities and other private university sahre the expertise in machine learning with participants using real time problems.This FDP offered a great arena for exchanging information and findings regarding machine learning theory, methodology, and applications. Partcipants are enriched with Hands-on based learning on various machine learning algorithms using python.

EVENTS

APP-A-THON

The CINTEL Students Association has conducted 24 hour Hackathon named "APP-A-THON" on 13th adn 14th October,2023. The Event provide students a platform to solve some of pressing problems we face in our daily lives, and thus inculcate a It offered an array of challenges to match the skillsets across multiple levels and promises to be more exciting than ever before gave an rush of adrenaline to the participants. The Event started with 33 teams with Round 1 was all about grand ideas. Round 2 meant diving into the code. The final showdown featured the top 10 teams, impressing the HCL Tech judges.

CSR ACTIVITY

Corporate social responsibility is inculcated to the students evenbefore they enter corporate. Teaching them they need to give backto the society. The aim of social accountability and making apositive impact on society. Some ways that a company can embraceCSR include being environmentally friendly and eco-conscious;promoting equality, diversity, and inclusion in the workplace;treating employees with respect; giving back to the community; andensuring business decisions are ethical.

The CIntel Students wentand thought computer underprivileged of Hope Charitable Trustand Local Schools. They spent their valuable weekends with autisticstudents and thought them arts and crafts.

HIGH-Performance
Computing Clusters

In the vanguard of computational innovation, CUDA (Compute Unified Device Architecture) emerges as a quintessential paradigm, propelling the capabilities of high-performance computing (HPC) clusters into a new echelon of efficiency and versatility. NVIDIA created CUDA, which serves as the foundation for utilizing the impressive capabilities of graphics processing units (GPUs) not just for graphical rendering but also as accelerators for a wide range of computational tasks. This article delves into the symbiotic relationship between CUDA and HPC clusters, elucidating how this alliance is reshaping the landscape of computational science, engineering, and beyond with unprecedented velocity and precision.

Integration of CUDA within HPC

The integration of CUDA within HPC clusters signifies a pivotal shift towards a more granular level of parallelism. It allows for the meticulous orchestration of thousands of threads and the adept management of diverse computational workloads across a multitude of GPUs, thereby amplifying computational throughput and slashing processing times dramatically.Such an architecture not only accelerates the resolution of computationally intensive tasks but also elevates the precision of outcomes, enabling researchers to delve into simulations and analyses with unparalleled depth and fidelity.

Democratization of Parallel Computing

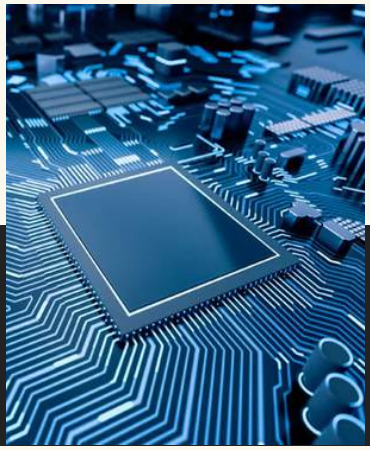
At the heart of CUDA's philosophy lies the democratization of parallel computing. By facilitating direct access to the GPU's virtual instruction set and parallel computational elements, CUDA empowers developers to harness the GPU's capabilities with an elegance and simplicity hitherto unattainable.This openness extends to HPC clusters, where the combination of CUDA-enabled GPUs breaks down traditional computer barriers, making it possible to easily handle huge datasets and complicated simulations.

Furthermore, CUDA's architecture fosters an environment of innovation in algorithm development. By abstracting the complexities of GPU hardware, it provides fertile ground for the conception of algorithms that are inherently parallel, thus unlocking new avenues for solving complex problems in areas as varied as quantum chemistry, climate modeling, and artificial intelligence.

Samudra Banerjee
Vice-President

These algorithms, optimized for parallel execution from the outset, are instrumental in exploiting the full potential of HPC clusters, driving forward scientific discovery and technological advancement at an accelerated pace.

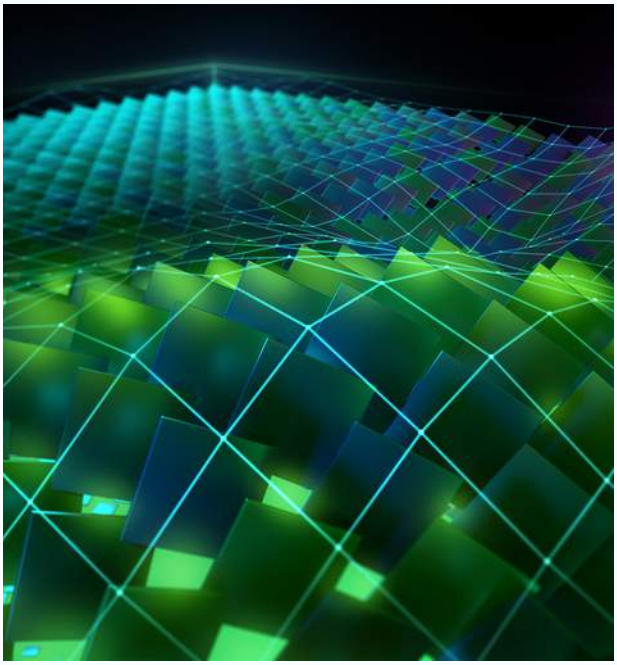
Yet, the integration of CUDA within HPC clusters is not without its challenges. It necessitates a profound understanding of parallel computing principles and the nuances of memory management, synchronization, and communication between GPUs and CPUs. Moreover, the heterogeneity of HPC environments demands robust, scalable solutions that can adapt to varying computational loads and interconnect topologies. Addressing these challenges requires a concerted effort in software development, encompassing the refinement of compilers, debuggers, and profiling tools that can optimize performance and ease the development process.



Pursuit of Enquiries once deemed infieasible

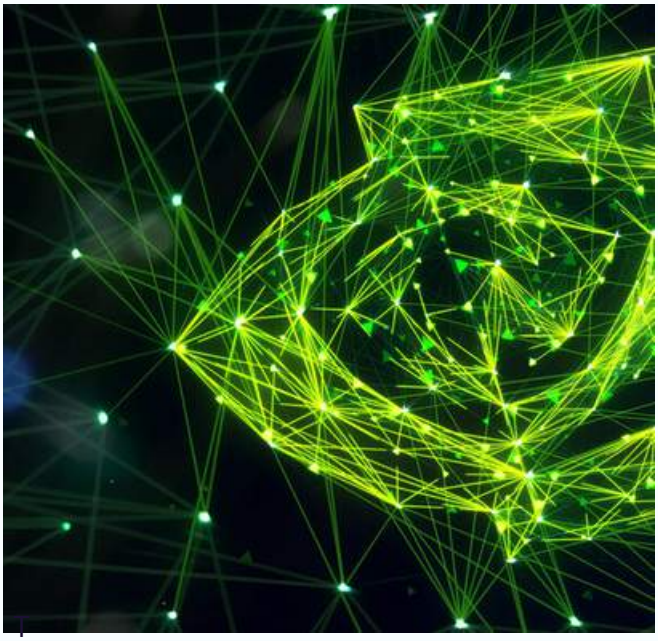
In conclusion, the confluence of CUDA and HPC clusters represents a seminal advancement in the field of high-performance computing. It heralds a new era where the scalability, speed, and efficiency of computational tasks are dramatically enhanced, enabling the pursuit of inquiries that were once deemed infeasible. As we stand on the brink of this computational renaissance, it is incumbent upon researchers, developers, and practitioners to embrace the possibilities engendered by this fusion, pushing the boundaries of what can be achieved through the power of parallel computing. The journey ahead, fraught with challenges and brimming with potential, promises to unfold new horizons in scientific exploration and innovation, underscored by the relentless pursuit of knowledge and the unyielding power of CUDA-enabled HPC clusters.

CASE STUDY
OF CUDA APPLICATIONS

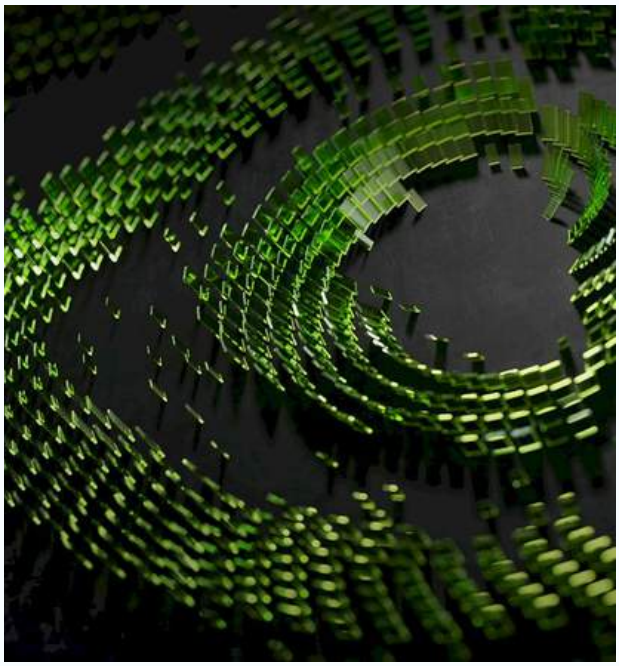


A big change has happened in computational science and engineering because of NVIDIA's Compute Unified Device Architecture (CUDA). Now, graphics processing units (GPUs) can be used for a lot of different scientific, analytical, and engineering tasks because they can process data in parallel.Beyond its initial purview of graphics rendering, CUDA has emerged as a linchpin in high-performance computing (HPC), facilitating a leap in computational efficiency and complexity that was hitherto unattainable.

Through a series of illustrative case studies, the multifaceted applications of CUDA underscore its pivotal role in advancing research, innovation, and problem-solving across diverse domains.Molecular Dynamics Simulations: In the realm of computational chemistry and biology, CUDA has been instrumental in propelling molecular dynamics simulations to new heights. A quintessential example is the application of CUDAin the GROMACS simulation package, a tool of paramount importance for the study of biomolecular systems.By leveraging CUDA, researchers have achieved significant speedups in simulations, enabling the real-time analysis of complex molecular interactions at an atomic level. This acceleration has profound implications for drug discovery and the understanding of biological processes, where the ability to simulate and analyze large biomolecular systems rapidly is crucial.Deep Learning and Artificial Intelligence: The emergence of CUDA-enabled GPUs has significantly accelerated the growth of artificial intelligence (AI)

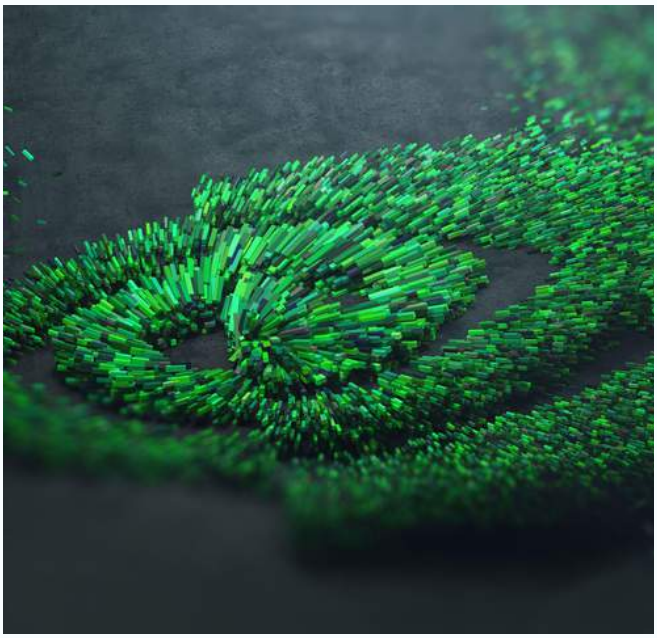


and deep learning. Deep learning frameworks like TensorFlow and PyTorch have been optimized for CUDA, allowing for the parallel processing of large neural networks. This synergy has enabled the training of models on vast datasets with unprecedented speed, facilitating breakthroughs in computer vision, natural language processing, and predictive analytics. One example is using CUDA to train GPT (Generative Pre-trained Transformer) models. The parallel computing capabilities of GPUs have been very helpful in meeting the model's high computational needs, which has led to progress in understanding and creating natural language.



Climate Modeling: The exigencies of climate research, with its need for simulating complex climate systems over extensive temporal and spatial scales, have found a robust ally in CUDA. By employing CUDA-enabled GPUs, climate scientists have significantly reduced the time required for simulations, enabling more accurate and granular predictions of climate patterns and events. This acceleration is pivotal for understanding climate change's impacts, informing policy decisions, and developing strategies for mitigation and adaptation.

Financial Modeling: In the financial sector, CUDA has transformed the landscape of risk assessment and market analysis. The Monte Carlo method, a computational algorithm used for modeling the probability of different outcomes in a process that cannot easily be predicted due to the intervention of random variables, has been vastly optimized using CUDA. This optimization allows financial institutions to conduct millions of simulations in parallel, significantly enhancing the accuracy and speed of risk analysis, portfolio optimization, and derivative pricing. These case studies exemplify the transformative impact of CUDA in pushing the boundaries of what is computationally feasible, heralding a new era of scientific inquiry and technological innovation. By democratizing access to high-performance computing through the parallelprocessing power of GPUs, CUDA has



not only accelerated research and development across a multitude of disciplines but also underscored the critical role of computational technologies in addressing some of the most pressing challenges and opportunities of our time.

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Swetanshu Agrawal
President

MEMORANDOM OF UNDERSTANDING

A Memorandum of Understanding (MoU) was signed by the Department of Computational Intelligence and HyperVerge Technologies Private Limited, Bangalore, formally establishing a strategic partnership. By promoting exchange programmes, strengthening collaborative research, and bridging the gap between academia and real-world industry applications, this partnership is expected to improve the academic and research landscape. Celebrating the start of a journey towards mutual success and ground-breaking accomplishments in the field of computation, the signing ceremony was graced by important figures from both sides.

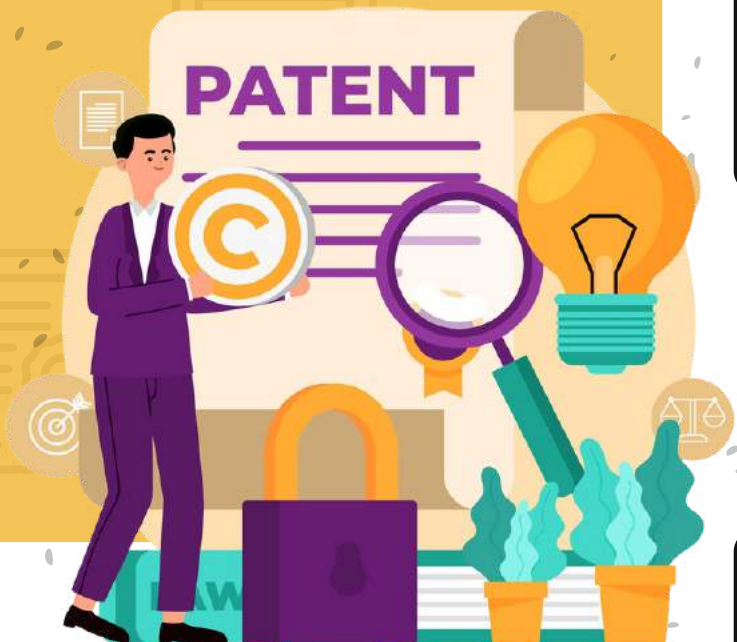
With the help of this partnership, a dynamic learning environment will be established where students can supplement their theoretical education with practical experience gained through industry exposure, internships, and project work. Additionally, it gives academic staff members the chance to collaborate on research projects and create curricula that reflect current technological developments. HyperVerge Technologies and the Department of Computational Intelligence work together to foster innovation and equip students to make important contributions to both academia and business.

PATENTS & Grants

- Dr. B. Hariharan received a patent grant for "DEVICE FOR VEHICLE DRIVER DROWSINESS DETECTION" from IPR, India.
- Kanipriya M, Dr. Sheryl Oliver, and Dr. R. Usharani were granted a patent for "IOT BASED AUTOMATIC ROBOTIC WASTE BIN" by IPR, India.
- Kanipriya M, Dr. Sheryl Oliver, and Dr. R. Usharani also received a patent grant for "IOT BASED HEIGHT ADJUSTABLE WHEELCHAIR" from IPR, India.
- Dr. Antony Sophia N, Dhilsath Fathima M, Dr. S.P. Angelin Claret, and Dr. G. Tamilmani published a patent titled "Automatic Indication of Smart Board Dusters using IoT" with IPR, India.
- Dr. R. Usharani published a patent titled "ACCURATE DIAGNOSIS OF LUNG CANCER BASED ON CHEST CT IMAGES USING FEDERATED LEARNING AND BLOCKCHAIN SYSTEMS" with IPR, India.
- Babu K published two patents titled "Design System of Deep Learning-Based Leaf Disease Detection in Crop Images for Agricultural Applications" and "AN EFFECTIVE METHOD FOR ESTIMATING SECURITY RISKS IN IOT ACCESS CONTROL MODELS," both with IPR, India.
- Dr. K. Babu published a patent titled "Design Intelligent Human Activity Tracking and Monitoring System for eHealth Care Using IoT" with IPR, India.

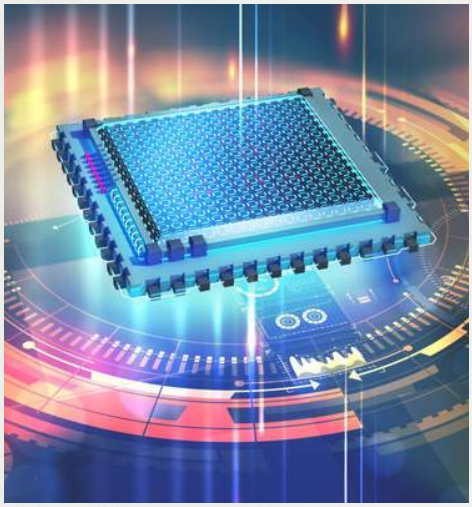
PATENTS & Grants

- Akshya J published a patent titled "PORTABLE PRINTER" with IPR, India.
- Dr. M.S. Abirami published patents titled "SYSTEMS AND METHODS FOR ASSESSING PERFORMANCE OF A USER" and "A SYSTEM FOR SENTIMENT ANALYSIS AND A METHOD THEREOF," both with IPR, India.
- Dr. A. Alice Nithya published a patent titled "A SYSTEM AND A METHOD FOR ASSISTING VISUALLY IMPAIRED USERS" with IPR, India.
- Dr. R. Beaulah Jeyavathana published a patent titled "IOT & AI FOR SMART AUTOMATION IN INDUSTRY 4.0 USING SENSORS" with IPR, India.
- Dr. R. Usharani, Kanipriya M, and Dr. Sheryl Oliver published a patent titled "MACHINE LEARNING SYSTEMS AND METHODS FOR PREDICTING CHRONIC KIDNEY DISEASE" with IPR, India.
- Kanipriya M and Dr. Sheryl Oliver published a patent titled "METHOD OF PREDICTING DIABETES USING ML" with IPR, India.
- Dr. M.S. Abirami and Dr. M. Uma published a patent titled "A SYSTEM FOR MONITORING HEALTH CONDITION OF A SUBJECT AND A METHOD THEREOF" with IPR, India.



Quantum computing and its intersection with HPC

As the dawn of quantum computing breaks upon the horizon of technological innovation, its intersection with the established realm of high-performance computing (HPC) heralds a transformative epoch in computational science.



This new combination is about to change the limits of what computers can do by combining the deterministic power of classical computing with the probabilistic nuance of quantum mechanics.This will help scientists solve som e of the most difficult and perplexing problems they have ever encountered.

Quantum computing, with its foundation in the principles of quantum mechanics, introduces an entirely new paradigm of computation. At its heart lies the quantum bit, or qubit, capable of embodying a state of superposition, thereby representing multiple states simultaneously, as opposed to the binary singularity of traditional bits.

This quantum phenomenon, coupled with the entanglement of qubits, enables quantum computers to perform a multitude of calculations in parallel, offering a dramatic escalation in processing power for certain classes of problems.

The symbiosis of quantum computing and HPC is not merely additive but multiplicative, promising to unlock new realms of computational speed and efficiency.HPC, with its vast arrays of parallel processors and sophisticated algorithms designed HPC, with its vast arrays of parallel processors and sophisticated algorithms designed to tackle large-scale scientific and engineering challenges, stands on the cusp of a revolution, spurred by quantum computing's potential to solve complex, non-polynomial-time problems that are currently beyond reach.

This intersection is particularly potent in the realms of cryptography, materials science, and drug discovery.

Quantum computing, with its ability to factorize large numbers exponentially faster than classical computers, could render current encryption methodologies obsolete, thereby catalyzing the development of quantum-resistant cryptographic algorithms. In materials science and drug discovery, quantum simulation of molecular interactions could speed up the process of designing new materials and drugs. In the past, these tasks have been impossible to do on a computer because of how detailed and complicated quantum mechanics is.

Yet, the integration of quantum computing within HPC ecosystems is fraught with formidable challenges. Quantum computers, in their current embryonic state, are highly sensitive to environmental perturbations, necessitating sophisticated error correction techniques and cryogenic temperatures to maintain qubit coherence. Moreover, the development of quantum algorithms that can leverage this nascent technology within traditional HPC frameworks remains an area of intense research and innovation.

he pathway to harmonizing quantum computing with HPC also demands a reevaluation of computational infrastructure, from the architecture of data centers to the interconnectivity between classical and quantum processors. Because of this, hybrid computing models have been created, in which quantum processors do specific tasks within larger computational workflows that are managed by traditional HPC systems.

In conclusion, the intersection of quantum computing and HPC is an exhilarating frontier, brimming with both promise and challenge. As researchers and technologists navigate this nascent confluence, they are not merely pushing the envelope of computational power but are also redefining the very fabric of problem-solving across scientific disciplines. This journey, though laden with uncertainties, holds the potential to unlock mysteries ranging from the fundamental nature of the universe to the intricacies of life itself. In this endeavor, the fusion of quantum computing and HPC emerges not just as a testament to human ingenuity but as a beacon guiding us toward uncharted territories of knowledge and capability.

Bidipta Biswas
Content Writer

FUNDED Projects

Dr. Velliangiri from Dept of CINTEL has received funds for two projects supported by the Basic Science Research Program through the National Research Foundation of Korea (NRF), Ministry of Education worth Rs. 2.7 lacs.

He along with Prof. Nam-Kyun Baik, Department of Cyber Security, Duksung Women's University, Seoul, Republic of Korea, has granted for project titled, "Detecting DDoS attacks in IoT-based networks using deep learning".

Also he collobrate with Prof. Dongoun Lee, Department of Architectural and Civil Engineering, Dongseo University, Busan, 47011, Republic of Korea has recieved a grant for Project Titled, "Development of a realistic botnet dataset in the Internet of Things for network forensic analytics".

EXASCALE COMPUTING

In the relentless quest for computational supremacy, the frontier of exascale computing emerges as a beacon of scientific progress and technological prowess. This ambitious endeavor, transcending the threshold of executing a quintillion calculations per second, heralds a new epoch in the annals of high-performance computing (HPC). It is within this crucible of innovation that researchers and technologists alike converge, seeking to unravel the complexities of the universe, accelerate the pace of discovery, and forge solutions to some of the most daunting challenges of our time.

Exascale computing represents not merely an incremental advancement in processing speed but a monumental leap forward, promising to catalyze breakthroughs across diverse domains— from climate modeling and precision medicine to the enigmatic realms of quantum mechanics and cosmology. Yet, the journey toward exascale and beyond is fraught with formidable technical challenges, necessitating a confluence of cutting-edge technologies, innovative architectures, and novel programming paradigms.At the core of exascale computing lies a symphony of advanced hardware and software orchestration.

The design and deployment of exascale systems demand a radical reimagining of computing architectures, embracing heterogeneity in processors and memory hierarchies to optimize performance and energy efficiency. Such systems must seamlessly integrate traditional CPUs with an array of accelerators—such as GPUs and FPGAs—each tailored to specific computational tasks, thereby achieving unprecedented levels of parallelism and speed.

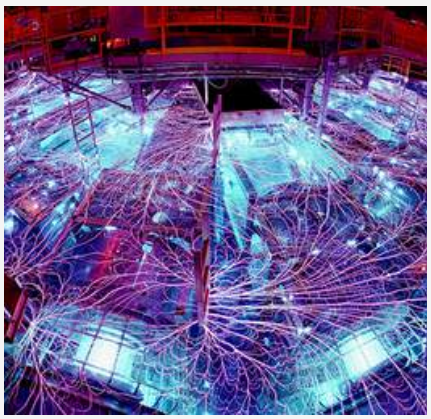
Moreover, the transition to exascale computing compels a renaissance in software development, where algorithms must be meticulously crafted to exploit the sprawling landscape of parallelism inherent in exascale architectures.. This endeavor requires a profound symbiosis between hardware and software, ensuring that applications can scale effectively across millions of processing cores, manage colossal datasets, and maintain resilience in the face of intermittent hardware failures.

The ascendancy to exascale also brings to the fore the critical issue of energy consumption. As computational capacities swell, so too does the demand for power, posing a significant challenge to the sustainability of HPC ecosystems. Addressing this conundrum necessitates innovations in energy-efficient computing, from the development of low-power components and cooling technologies to the optimization of software for energy conservation.

Beyond the technical intricacies, exascale computing embodies a profound opportunity to advance human knowledge and societal well-being. It is poised to accelerate the pace of scientific discovery, enabling simulations of unparalleled complexity and precision.

Researchers can explore the dynamics of climate change with greater fidelity, design novel therapeutics through molecular simulations, and probe the mysteries of the universe with enhanced computational telescopes.
As we venture into the exascale era and beyond, the future of computing beckons with both promise and challenge. It invites a multidisciplinary coalition of scientists, engineers, and

policymakers to navigate the complexities of this next frontier. Together, they must forge the path toward not only achieving exascale computing but also harnessing its potential responsibly, ensuring that this monumental power is wielded to illuminate the shadows of ignorance, heal the ailments of society, and elevate the human condition to unprecedented heights.



. In this pursuit, the boundaries of possibility are continually redrawn, heralding a future where the computational leviathans of today become the stepping stones to even more extraordinary realms of exploration and discovery.

Aakash Sharma
Secretary

TOP PLACEMENTS

NOVARTIS

istop Keep Growing

NAVYA GUPTA

PARAS ATAL

Stipend: 25000 p.m. / CTC: 8.52 LPA

GAURAV KUMAR

CTC-10.0LPA, Stipend-15,000 pm

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CTC: 6.37 LPA

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Karthik Kumar Reddy

Stipend: 15000 p.m.

Aditya Jangiti

CTC: 4.5-6.0

ANKIT YADAV

Stipend: 30000 p.m. / CTC: 12.0 LPA

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Siddhant Vaibhav

Stipend-12,000pm, CTC-5.2LPA

JOSHIKARAN K

KOLAPATI MANI DEEPAK CHANDU

CTC-6.0LPA, Stipend-25,000pm

Make the future green

ENERGY EFFICIENT

HPC SYSTEMS

In the realm of high-performance computing (HPC), the relentless quest for computational supremacy has traditionally been pursued with scant regard for energy consumption. However, the burgeoning awareness of environmental sustainability and the escalating operational costs have precipitated a paradigm shift towards energy-efficient HPC systems. This article delves into the intricacies of these systems, underscoring the imperatives for energy efficiency and elucidating the strategies and innovations that are being harnessed to surmount the challenges inherent in achieving this goal.

Use of Renuable Energy

moreover, the integration of renewable energy sources into the HPC energy supply mix presents a promising avenue for reducing carbon emissions. The use of solar panels, wind turbines, and other renewable energy technologies can help HPC facilities become more sustainable by offsetting a sizable portion of their energy usage.The challenges of achieving energy efficiency in HPC are, however, substantial. The inherent trade-offs between computational performance and energy consumption necessitate a careful balancing act.

securing a safe future

Is it the solution?

Striking the optimal balance requires not only technological innovations but also a holistic approach that encompasses policy-making, financial investment, and user education.

In conclusion, the evolution of energy-efficient HPC systems represents a critical juncture in the advancement of computing technologies. It signifies a departure from the single-minded pursuit of computational speed towards a more balanced approach that places equal emphasis on performance, energy consumption, and environmental sustainability. The journey towards energy-efficient HPC is fraught with challenges, yet it is imperative for the future of computing and the sustainability of our planet.

Make the future green

The quest for energy efficiency in HPC is multifaceted, encompassing a broad spectrum of strategies ranging from hardware optimization to software advancements. On the hardware front, the design and deployment of energy-efficient components are paramount. This includes the integration of processors that exhibit a higher performance-per-watt ratio, the adoption of advanced cooling technologies to mitigate the energy overhead of thermal management, and the implementation of power-aware memory systems. These components are the cornerstone upon which energy-efficient HPC systems are built, enabling a reduction in power consumption without compromising computational prowess.

NEED of the Hour?

Energy-efficient HPC systems are not merely a response to the exigencies of environmental stewardship but also a pragmatic adaptation to the economic realities of running large-scale computational facilities.

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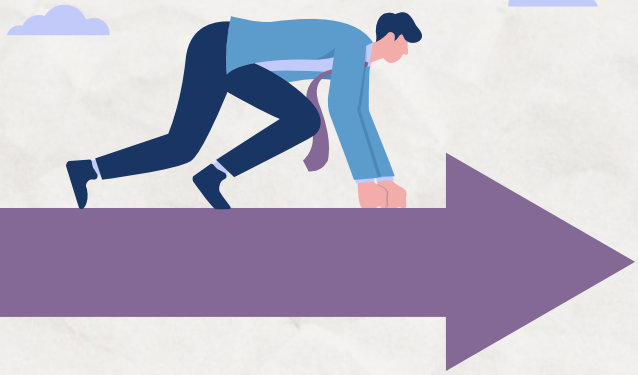
Pragmatic approach of running large scale facilities

The astronomical energy requirements of conventional HPC systems impose a significant financial burden, not to mention their environmental footprint in terms of carbon emissions. Hence, the drive towards energy efficiency is both an ecological imperative and an economic necessity.

Ritveek Rana
Web Master



FACULTY UPSKILLING

1

A week long FDP on “Artificial Intelligence in Data Science and its Applications in IoT”, was held at SRM Institute of Science and Technology (SRMIST) located in Kattankulathur, and took place from the 27th of November to the 2nd of December in 2023. The program was attended by **Dr. Ferni Ukrit, Dr. M.S. Abirami, Dr. B. Jothi, , Dr. Sridevi Ponmalar, Dr. B. Pitchai Manickam, Dr. S.P. Angelin Claret, Dr. Antony Sophia N, and Dr. Pritam Khan**. The FDP was designed to explore the application of artificial intelligence in data science and its role in the Internet of Things (IoT) landscape. The event provided participants with an opportunity to enhance their knowledge and expertise in this rapidly evolving field.

2

Dr. C. Amuthadevi participated in a week-long national-level Faculty Development Programme (FDP) on Cloud Infrastructure (AWS) from August 21 to 25.

3

Dr. S. Amudha and Dr. Antony Sophia N participated in a week-long Faculty Development Program (FDP) on "Data Analytics - Unleashing the Power BI" from October 16 to 20, 2023. The FDP was organized by the Department of Computer Science and Engineering at KSR Institute for Engineering and Technology in Tiruchengode, Tamil Nadu

4

Dr. M. Salomi participated in the Faculty Development Programme (FDP) on "AI Enabled AR/VR in Communications & Signal Processing Application" from 3rd to 7th October 2023. The event was organized by the Department of Electronics and Communication Engineering, Nalla Narasimha Reddy Education Society's Group of Institutions - Integrated Campus.

5

Dr.Kanipriya .M completed UHV -2 online FDP conducted from 16th Oct to 21st Oct 2023. And also, participated in FDP titled "Linux Applications in Engineering Education" conducted by NITTTR.

6

Dr. A.Alice Nithya attended the Special Interest Group in Artificial Intelligence for Business Research Symposium co-hosted by the School of Business, UniSQ, and the School of Computing, SRM Institute of Science and Technology, India, was successfully conducted at the UniSQ Springfield campus and online on 23 November 2023.

7

Dr. S.P. Angelin Claret and Dr. Antony Sophia N completed ATAL FDP from December 4-9, 2023 at VEL TECH Rangarajan Dr. Sagunthala R&D Institute of Science and Technology in Chennai.

PUBLICATION

- **Meenakshi N et al**. published a paper titled “An Analysis of Advanced Computations and Semantic Reasoning to Create an Intelligence System Using WSN” in the Recent Trends in Artificial Intelligence and IoT First International Conference. Meenakshi N et al. published a paper titled “Pending Receipts RPA Bot” in Cognitive Science and Technology.

- **Dr. M. Salomi Samsudeen et al**. published a paper titled “Retracing-Efficient IoT Model for Identifying Skin-Related Tags Using Automatic Lumen Detection” in Intelligent Data Analysis, IOS Press.

- **Dr. M. Ferni Ukrit et al**. published a paper titled “Human Fall Detection Using Gaussian Mixture Model and Fall Motion Mixture Model” in IEEE Xplore.

- **Babu K et al**. published a paper titled “Type 2 Diabetes Mellitus Classification Using Predictive Supervised Learning Model” in Soft Computing.

- **Dr. M. Salomi Samsudeen et al**. published a paper titled “Optimized Flexible Network Architecture Creation Against 5G Communication-Based IoT Using Information-Centric Wireless Computing” in Wireless Networks, Springer.

- **Dr. Kanipriya M et al**. published a paper titled “Revolutionizing Neural Network Efficiency: Introducing FPAC for Filter Pruning via Attention Consistency” in Neural Computing and Applications.

- **Dr. S. Selvakumara Samy et al**. published a paper titled “Identifying Illicit Transactions in Bitcoin Tumbler Services Using Supervised Machine Learning Algorithms” in the 2023 12th International Conference on Advanced Computing (ICoAC).

- **Dr. B. Hariharan et al**. published a paper titled “Efficient Budget Aware Workflow Scheduling in Cloud Using Adaptive Tasmanian Devil Optimization Algorithm” in Multimedia Tools and Applications.

- **Sumathy G et al**. published a paper titled “Radon Transform-Based Improved Single Seeded Region Growing Segmentation for Lung Cancer Detection Using AMPWSVM Classification Approach” in Signal, Image and Video Processing.

PUBLICATION

- **Dr. Sherin Shibi C et al**. published two papers titled “Handwritten Character Recognition System Using Deep Learning Models for Tamil Language” in the 2023 International Conference on Sustainable Computing and Smart Systems (ICSCSS) and “Tribological Characteristics of Additively Manufactured 316 Stainless Steel Against 100 Cr6 Alloy Using Deep Learning” in Tribology International.

- **Dr. AR Arunarani et al**. published papers titled “Improved Red Deer Algorithm for Scientific Workflow Scheduling in Cloud Environment” at the 5th International Conference on Inventive Research in Computing Applications (ICIRCA 2023), “Crop Yield Prediction Using Spatio Temporal CNN and Multimodal Remote Sensing” at the International Conference on Augmented Intelligence and Sustainable System (ICAISS 2023), and “Intelligent Model for Avoiding Road Accidents Using Artificial Neural Network” in the International Journal of Computers Communications and Control.

- **Dr. N. Kanimozhi et al**. published a paper titled “BERT-BiGRU-CRF Application in Insulin Dosage Monitoring System for Control of Blood Glucose Levels in Type 2 Diabetic Patients” in the Proceedings of the 2023 2nd International Conference on Augmented Intelligence and Sustainable Systems (ICAISS 2023).

- **Dr. S. Prithi et al**. published papers titled “Exploration of Sentiment Analysis in Twitter Propaganda: A Deep Dive” in Multimedia Tools and Applications and “Blockchain-Enabled Precision Agricultural System Using IoT and Edge Computing” in IEEE Explore.

- **Akshya J et al**. published a paper titled “The Smart Coverage Path Planner for Autonomous Drones Using TSP and Tree Selection” at the 9th International Conference, MIKE 2023 Kristiansand, 2023 Proceedings.

- **Karthick S et al**. published a paper titled “Hybrid Approaches for Intracerebral Hemorrhage Stroke Classification Using Deep Learning Techniques” at the IEEE 2023 4th International Conference on Smart Electronics and Communication (ICOSEC).

- **T R Saravanan et al**. published a paper titled “Deep Convolutional Neural Network-Based Henry Gas Solubility Optimization for Disease Prediction in Data from Wireless Sensor Network” in Soft Computing.

PUBLICATION

- **Dr. Gopirajan PV et al**. published a paper titled “Machine Learning Approach for Determining the Water Quality of Freshwater Lakes: A Case Study on Selected Lakes of Chennai, India” in Environmental Quality Management.

- **Dr. AR Arunarani et al**. published papers titled “Enhanced Honey Badger Algorithm for Resource Allocation and Task Scheduling in Cloud Environment” and “Dark Vision Assistive Application for Deaf-Blind People” at the 4th International Conference on Smart Electronics and Communication (ICOSEC 2023).

- **Dr. S.Prabhu et al**. published a paper titled “A Novel Optimised GWOAN Algorithm for Scheduling Task and Power Consumption in MEC Network” in the International Journal of Intelligent Systems Technologies and Applications.

- **Dr. AR Arunarani et al**. published a paper titled “Exploring the Potential of Artificial Intelligence for Automated Sentiment Analysis and Opinion Mining” in Toward Artificial General Intelligence: Deep Learning, Neural Networks, Generative AI.

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- **Dr. Dhilsath Fathima M et al**. published a paper titled “Automatic Title Generation with Attention-Based LSTM” in Lecture Notes in Electrical Engineering, vol 1079, Springer.

- **Dr. C. Lakshmi et al**. published a paper titled “A Systematic Study of Challenges in Cervical Cytology Image Segmentation of Intelligence-Based Cervical Cancer Screening” in IEEE XPLORE.

PUBLICATION

- **Dr. Reshmy A.K. et al**. published papers titled “Cloud Security Based on Quality of Service Using an Optimised Version of the ANFIS Model for Smart City Applications” and “A Modified Grey Prediction Method-Based Hybrid Cryptography Mechanism for Cloud Security on Smart Cities” in the Journal of Environmental Protection and Ecology.

- **Velliangiri S et al**. published book chapters titled “Blockchain Security for the Internet of Things,” “IoT and Blockchain-Enabled Charging Station for Electric Vehicles,” and “Learning Approaches for Security and Privacy in Internet of Things” in the Internet of Things book.

- **Dr. S. Amudha et al**. published papers titled “Deep Learning for Plant Disease Detection and Crop Yield Prediction Based on NPP-WPF Analysis in Smart Agriculture” at the 7th International Conference on I-SMAC (IoT in Social, Mobile, Analytics and Cloud), I-SMAC 2023 - Proceedings and “Design and Development of Robots for Medical Assistance: An Architectural Approach” in Contemporary Applications of Data Fusion for Advanced Healthcare Informatics.

- **Dr. Akshaya J et al**. published a paper titled “UAV Smart Navigation: Combining Delaunay Triangulation and the Bat Algorithm for Enhanced Efficiency” at the 9th International Conference, MIKE 2023 Kristiansand, 2023 Proceedings.

- **Dr. M. Uma, Kaviyaraj R et al**. published a paper titled “A Review on Augmented Reality and YOLO” in the Proceedings of the Fourth International Conference on Smart Electronics and Communication (ICOSEC-2023).

- **Dr. M. Uma et al**. published a paper titled “Agarwood Grade Estimation Procedure Using CNN and Sculpture Automation” in the Proceedings of the Second International Conference on Edge Computing and Applications (ICECAA 2023).

- **Dr. K. Vijayalakshmi et al**. published a paper titled “Sky Sentinel: Pioneering Real-Time Facial Recognition in Intelligent Drones” at an IEEE Conference and another paper with Dr. E. Poongothai titled “Deep Learning for Plant Disease Detection and Crop Yield Prediction Based on NPP-WPF Analysis in Smart Agriculture” at the same conference.

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- **Velliangiri S et al**. published papers titled “Class Scatter Ratio Based Mahalanobis Distance Approach for Detection of Internet of Things Traffic Anomalies” in Mobile Networks and Applications and “Cancer Prediction Using Feature Fusion and Taylor-TSA Based GAN with Gene Expression Data” in the International Journal of Pattern Recognition and Artificial Intelligence.

- **Dr. M. Uma et al**. published a paper titled “Evaluation of Wavelet Transformed Features on Detection of Epileptic Seizures Using 2D Scalogram Images of EEG Signals” at the 12th International Conference on Advanced Computing (ICoAC).

- **Dr. AR Arunarani et al**. published a paper titled “Enhanced Honey Badger Algorithm for Resource Allocation and Task Scheduling in Cloud Environment” at the 4th International Conference on Smart Electronics and Communication (ICOSEC 2023).

- **Dr. AR Arunarani et al**. also published a paper titled “Dark Vision Assistive Application for DeBlind People” at the 4th International Conference on Smart Electronics and Communication (ICOSEC 2023).

- **Dr. S. Prithi et al**. published papers titled “Blockchain-Enabled Precision Agricultural System Using IoT and Edge Computing” in IEEE Explore and “Artificial Intelligence-Driven Digital Twins in Industry 4.0” in Digital Twin for Smart Manufacturing.

- **Dr. M. Ferni Ukrit et al**. published a paper titled “Deep Multi-Convolutional Stacked Capsule Network Fostered Human Gait Recognition from Enhanced Gait Energy Image” in Signal, Image and Video Processing, Springer.

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- **Dr. S. Nagendra Prabhu et al.** published a paper titled “A Novel Optimised GWOAN Algorithm for Scheduling Task and Power Consumption in MEC Network” in the International Journal of Intelligent Systems Technologies and Applications.

- **Dr. AR Arunarani et al.** published a paper titled “Exploring the Potential of Artificial Intelligence for Automated Sentiment Analysis and Opinion Mining” in Toward Artificial General Intelligence: Deep Learning, Neural Networks, Generative AI.

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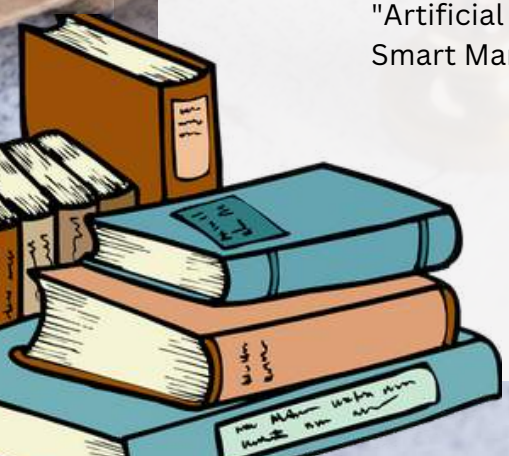

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- **Dr. Sudha Rajesh et al**. published papers on "CAD-Based Automatic Detection of Tuberculosis in Chest Radiography Using Hybrid Method" in the International Journal of Engineering Systems Modelling and Simulation and "Revolutionizing Neural Network Efficiency: Introducing FPAC for Filter Pruning via Attention Consistency" in Neural Computing and Applications.

- **Dr. U Sakthi et al**. published "Circle-Inspired Sine Cosine Optimization-Enabled CRF-RNN and ZFNet for Brain Tumor Segmentation and Classification Using MRI Images" in the International Journal of Computational Methods.

- **Dr. S. Amudha et al**. published papers on "Deep Learning for Plant Disease Detection and Crop Yield Prediction Based on NPP-WPF Analysis in Smart Agriculture" at the 7th International Conference on I-SMAC (IoT in Social, Mobile, Analytics and Cloud), I-SMAC 2023 - Proceedings, and "Design and Development of Robots for Medical Assistance: An Architectural Approach" in Contemporary Applications of Data Fusion for Advanced Healthcare Informatics.

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- **Dr. Reshmy A.K. et al**. published papers titled "Cloud Security Based on Quality of Service Using an Optimised Version of the ANFIS Model for Smart City Applications" and "A Modified Grey Prediction Method-Based Hybrid Cryptography Mechanism for Cloud Security on Smart Cities" in the Journal of Environmental Protection and Ecology.

- **Velliangiri S et al**. published book chapters titled "Blockchain Security for the Internet of Things," "IoT and Blockchain-Enabled Charging Station for Electric Vehicles," and "Learning Approaches for Security and Privacy in Internet of Things" in the book "Internet of Things.

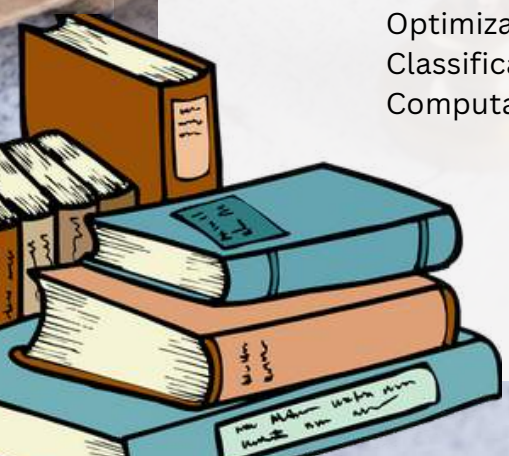
- · **Dr. S. Amudha et al**. published a paper titled “Deep Learning for Plant Disease Detection and Crop Yield Prediction Based on NPP-WPF Analysis in Smart Agriculture” at the 7th International Conference on I-SMAC (IoT in Social, Mobile, Analytics and Cloud), I-SMAC 2023 - Proceedings, and “Design and Development of Robots for Medical Assistance: An Architectural Approach” in Contemporary Applications of Data Fusion for Advanced Healthcare Informatics.

- · **Dr. Akshaya J et al**. published a paper titled “UAV Smart Navigation: Combining Delaunay Triangulation and the Bat Algorithm for Enhanced Efficiency” at the 9th International Conference, MIKE 2023 Kristiansand, 2023 Proceedings.

- · **Dr. M Uma, Kaviyaraj R et al**. published a paper titled “A Review on Augmented Reality and YOLO” in the Proceedings of the Fourth International Conference on Smart Electronics and Communication (ICOSEC-2023).

- · **Dr. Sudha Rajesh et al**. published papers titled “CAD-Based Automatic Detection of Tuberculosis in Chest Radiography Using Hybrid Method” in the International Journal of Engineering Systems Modelling and Simulation and “Revolutionizing Neural Network Efficiency: Introducing FPAC for Filter Pruning via Attention Consistency” in Neural Computing and Applications.

- · **Dr. U Sakthi et al**. published a paper titled “Circle-Inspired Sine Cosine Optimization-Enabled CRF-RNN and ZFNet for Brain Tumor Segmentation and Classification Using MRI Images” in the International Journal of Computational Methods.



Alumni Corner

Alumni Day 2023 at SRMIST unfolded as a heartwarming reunion of former students who,after years of traversing diverse paths, reconvened on December23 to celebrate shared memories and accomplishments. The event emanated a sense of camaraderie, with the institution adorned infestive decorations to welcome its distinguished alumni.

The day commenced with an air of nostalgia as passed-out lads from SRMIST gathered to make the event a soulful get-together.The presence of key dignitaries added a touch of prestige to the occasion. Dr.P.Sathyanarayanan ,Pro-Chancellor (Academics), Dr.C.Muthamizhchelvan, Vice-Chancellor, and other notable figures graced the event, underscoring the significance of the alumni community.

Mr.Vignesh
CrowdStrike

The Department of Computational Intelligence In Association with Directorate of Alumni Affairs organized a "Alumni event – From Novice to Ninja : Leveling up your coding skills", on 1st, December, 2023.

Mr.Vignesh V,Threat Research Engineer, Crowd strike provide iinformation about developing coding skills and programming skills. The resource person explained the adaption of industry standards for writing codes. Students are asking questions about certification courses.

ALUMNI TALK

“International Alumni Conclave: Unlocking career Success: Navigating your path beyond campus”,

The Department of Computational Intelligence In Association with Directorate of Alumni Affairs organized a “International Alumni Conclave: Unlocking career Success: Navigating your path beyond campus”, on 13th October,2023. Ms.Khushi Mundra, Avanish Sanghvi, Bhavesh Jain, of 2022 Passed out Batch has been the alumni for the event and enriched the students about the exciting opportunities beyond the campus to navigate the path successfully. Resource person explained the more opportunities for getting internship in foreign universities.

Vignesh Varma
Equity Analyst

The Department of Computational Intelligence In Association with Directorate of Alumni Affairs organized a “Alumni Talk on “Data Driven Decision making in Private Equity”, on 29th January, 2024.

Mr.Vignesh Varma (2017 Batch Alumni), from Equity Analyst has shared his Experience in the financial domain by exciting the exciting experience he had in his journey. Also explained the role of financing and role of investing, Data collection and analysis Process.

This session provided the additional information for key metrics and data sources, Due Diligence, Financial models, Portfolio management and top financial modeling software.

A million tiny lights twinkle in the cool air, which is alive with the aroma of spiced cider and crackles with expectation. Laughter erupts from festively decorated homes, and the air is filled with the joyous sound of singing. Children's eyes sparkle with fantasies of sugarplum fairies and a merry man in red, while stockings hang fat and full of promise. This, my dear reader, is the essence of Christmas magic—a time when warm hearts overflow, loved ones huddle around, and the prospect of fresh starts looms large in the atmosphere. Christmas has arrived, and its energy is infectious, so raise a glass, spread a grin, and bask in the magic.

Happy Diwali

Every year, Diwali, also called the Festival of Lights, casts India in vivid colors. Intricate rangolis cover homes, diyas provide a comforting glow, and the pleasure of popping crackers fills the air. Rich in tradition, Diwali is a festival that honors the victory of good over evil and the return of Lord Rama to Ayodhya following his 14-year banishment. Families get together to celebrate, exchange gifts, enjoy delectable treats, and deepen their relationships. As the night wears on, the sky changes into a canvas of glistening pyrotechnics, signifying the triumph of light over darkness. Diwali is a festival of rebirth, hope, and the enduring spirit of light, serving as a constant reminder that good always triumphs over evil.

Happy Pongal

Pongal is more than simply a tasty rice dish cooked in milk; it's a colorful harvest festival observed by Tamils worldwide. It spans four days and is brimming with thanksgiving for a plentiful harvest, directed towards Mother Nature, the Sun God, and farm animals. This happy occasion, which falls in the middle of January, commemorates both the sun's northward trek and the lucky Tamil month of Thai.Pongal is more than just food and customs. Families should use this opportunity to reunite, build their relationships, and show gratitude for all that nature has to offer. Pongal is a very touching holiday because of its message of thankfulness and unity, which serves as a reminder to treasure the blessings we receive and share them with others.

Republic Day!

Drums echo, flags flutter, and a nation marches in unison. India's 75th Republic Day dawns, a vibrant tapestry of cultural hues. From soaring fighter jets to folk dancers spinning in kaleidoscopic colors, the Kartavya Path shimmers with pride. Witness India's journey unfold - ancient traditions juxtaposed with futuristic marvels, diverse stories woven into one grand narrative. It's a day to celebrate democracy's resilience, salute sacrifices made, and dream of a future as bright as the tricolor that paints the sky. Happy Republic Day, India!

OUTREACH

The Department of Computational Intelligence & Computing Technology held an outreach programs for disabled and government school students.This initiatives exemplifies the power of collaboration in bridging the digital divide and fostering a love for STEM fields in young minds. The Department remains dedicated to expanding such programs, inspiring the next generation of scientific innovators with computational intelligence-based games and basic science experiments.

Another out reach programme was conducted with the goal of improving digital literacy among government school students from disadvantaged backgrounds. This was a noteworthy initiative that was aimed at primary school students at Annambedu and Rajakuppamand .The program's impact transcended academics. Witnessing the students' joy and sense of belonging, the organizers distributed certificates and school supplies, further encouraging their educational journeys.

Lastly another focusing on MS Office tools and email services.This initiative not only enhanced students' digital skills but also significantly raised their enthusiasm and confidence in using technology, laying a foundation for future learning. Beyond just imparting knowledge, its influence went beyond that, as it was essential in encouraging students to pursue careers in technology and creating a generation of tech-savvy adults.

FIND ME ?

L E A R N I N G Z Q N I S M C
M S I L E L L A R A P E R L F
U Z C O D T L P R Y J X E P J
P P R A F A U W M D J A T A B
M D O B M O T P B F M S S I O
W Y X A N O Q A M Q F C U D I
B B N W M W R A S O Z A L I A
E Q U O R Y V G K E C L C V Q
Y W Z J Q H I T N U T E Y N H
K U D F P F D I V V C S P N Z
F O R T A N H I D K T A S U V
U D H J J C S L K G D P L E L
L Y Z R A M H X T U O R W I S
L R R M Q H N O C X P H Q Z J
S F B N B S M H T I R O G L A

- ALGORITHMS
- CLUSTERS
- COMPUTER
- CUDA
- DATASETS
- EXASCALE
- FORTAN
- GROMACS
- LEARNING
- MACHINE
- NVIDIA
- PARALLELISM

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Ritveek Rana

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GRAPHIC DESIGNER

Bidipta Biswas
CONTENT WRITER

Aayushman Ghatak
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எவ்வ துறைவது உலகம் உலகத்தோடு
அவ்வ துறைவ தறிவு.

As dwells the world, so with the world to dwell
In harmony- this is to wisely live and well..

உயர்ந்தோர் வழியில் உலகம் எவ்வாறு நடைபெறுகின்றதோ அதற்கேற்ப நடந்து கொள்வதே அறிவாகும்..

To live as the world lives, is wisdom.