A REPORT ON

Workshop on PARAM SHAVAK: Fundamentals of HPC

Date: 07th April 2025
Venue: EA-803, E-Block, Silver Oak University, Ahmedabad

INTRODUCTION:

The series of **Workshop on PARAM SHAVAK** titled **Fundamentals of HPC**, organised under **IEEE Education Week** by **Silver Oak University IEEE Signal Processing Society Student Branch Chapter** and **ML Geeks Club** an initiative of **Silver Oak University IEEE Student Branch**, held at **Silver Oak University**, was an insightful session aimed at introducing students to the fundamentals and applications of **High-Performance Computing (HPC)**. The event was designed to provide participants with hands-on insights into cutting-edge techniques and tools used in HPC.

About the Speaker:

This workshop was conducted by two esteemed faculty members from the Computer Engineering Department at SOCET:

- **Prof. Monali Suthar,** Research Scholar at Silver Oak University; Assistant Professor at Silver Oak University.
- **Prof. Gaurav Tiwari,** Assistant Professor at Silver Oak University; Advisor, Silver Oak University IEEE Women in Engineering Student Branch Affinity Group.

Both speakers brought their extensive knowledge and experience to the session, ensuring that attendees gained a deeper understanding of the subject matter and its real-world applications.

About the Session:

Date: 07th April 2025
Time: 02:00 P.M. - 04:00 P.M.
Venue: EA-803, E-Block, Silver Oak University, Ahmedabad
Participants: 43

The session commenced with an introduction to High-Performance Computing (HPC), highlighting its significance in various industries such as scientific research, finance, and artificial intelligence. The speakers elaborated on the role of parallel computing, distributed systems, and cloud-based HPC solutions in modern computing environments.

The workshop began with an Introduction to PARAM SHAVAK, where the speakers' provided insights into this compact HPC system developed for high-performance applications. They further explored the History and Evolution of PARAM SHAVAK, detailing its impact on computational advancements over time. Attendees were also introduced to the Technical Specifications, where discussions revolved around the system's processing power, memory configuration, and performance benchmarks.

Further, the workshop also provided an introduction to CentOS, a Linux-based OS commonly used in HPC environments, followed by an overview of HPC Prerequisites, covering essential knowledge needed to work effectively with HPC systems.

An Interactive Q&A Session was conducted, where participants engaged in discussions on HPC functionalities, limitations, quantum computing, and pre-installed applications such as Torque and XdMoD. The session also explored the differences between Serial vs. Parallel Computing, explaining how serial computing contrasts with multithreading in terms of efficiency and resource management.

Moreover, discussion delved into Traditional vs. Parallel Architectures, exploring computing models like SISD, SIMD, MISD and MIMD, highlighting parallel models using shared and distributed memory mechanisms. A Practical Demonstration followed, where students established a connection with HPC PARAM SHAVAK, ran basic commands, and analysed cache memory, primary memory, and secondary memory status.

Participants gained valuable insights into PARAM SHAVAK, understanding its architecture, functionalities, and significance in (HPC). The session provided clarity on parallel computing, explaining how parallel architectures operate and their advantages over traditional computing models. Attendees also learned to interact with an HPC system, execute basic commands, and monitor system performance, enhancing their practical knowledge.

Conclusion:

This Workshop on PARAM SHAVAK proved to be a highly enriching experience for all participants, equipping them with fundamental knowledge and hands-on expertise in High-Performance Computing. The interactive nature of the session ensured that attendees left with a solid foundation in HPC concepts and their practical applications. Additionally, the workshop facilitated meaningful interactions among participants, encouraging knowledge sharing and collaboration in the field of HPC.

The achievement of this drive was made possible by Dr. Satvik Khara, Dean, School of Technology, Design and Computer Application; IEEE Senior Member; Chairperson, SIGHT, IEEE Gujarat Section; Chairperson, Technical Activity Committee, Computer Society, IEEE Gujarat Section; Founding Member, Silver Oak University IEEE Student Branch, whose exceptional guidance and support played a crucial role in making this wonderful opportunity open for everyone.

Some glimpses of the event:

Prof. Monali Suthar introducing attendees to the concept of HPC

Participants engaging in a doubt solving session with Prof. Gaurav Tiwari

Participants delving into the traditional to parallel programing way

Dr. Satvik Khara sharing valuable insights about PARAM SHAVAK