IEEE CTSoc Chapter MP- section: Technical Talk

25th October 2023, 12.00 Noon IST

1. **Speaker name: Prof. Preeti Ranjan Panda**

2. **Speaker Bio:** Prof. Preeti Ranjan Panda received his B. Tech. in CSE from IIT Madras and M.S. and Ph.D. from the University of California at Irvine. He is currently a professor in CSE at IIT Delhi, and serves as the Dean, Corporate Relations. He has previously worked at Texas Instruments and Synopsys and has been a visiting scholar at Stanford University. His research interests include Embedded Systems, Architecture, and Design Automation. He is the author of two books on embedded memory and power-efficient system design, and a recipient of an IBM Faculty Award and IESA Techno Mentor Award. Research works authored by Prof. Panda and his students have received several honours, including Best Paper nominations at ESWEEK, DATE, and ASPDAC, and Most downloaded paper of ACM TODAES journal. Prof. Panda has served as the Editor-in-Chief of IEEE Embedded Systems Letters, on the editorial boards of IEEE TCAD and ACM TODAES, and as the Technical Program Chair of major conferences including CASES and CODES+ISSS.

3. **Title of talk:** Emerging Memory Technologies - Into the Third Dimension

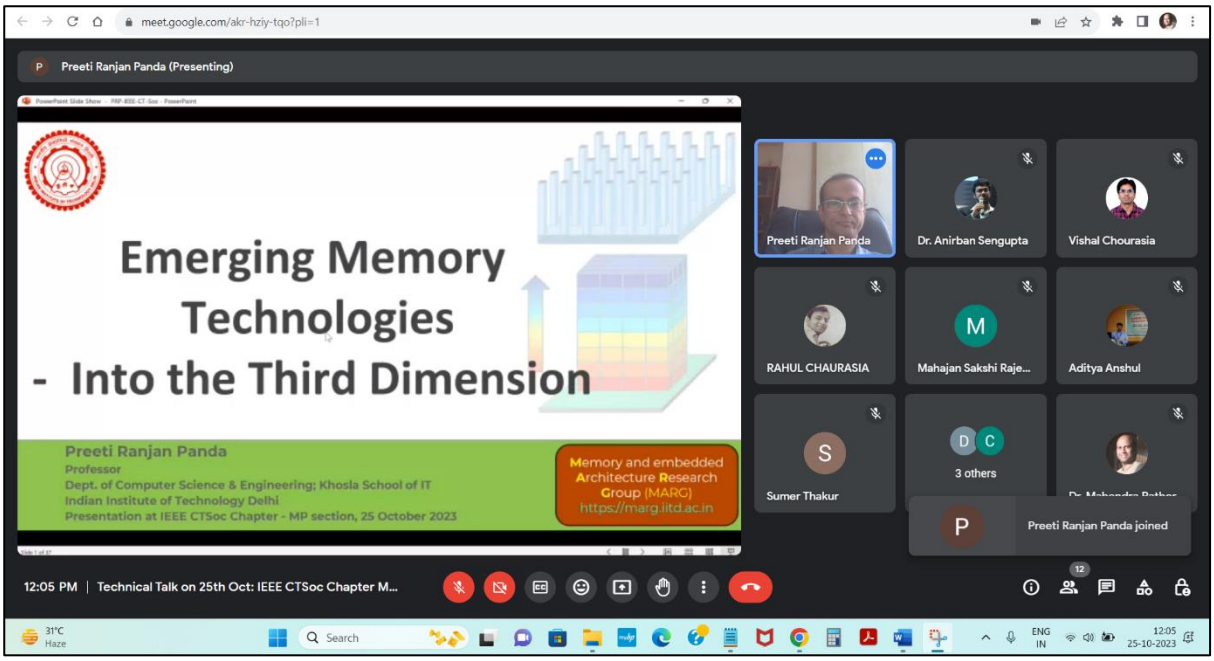
4. **Abstract of talk:** 3D stacking offers exciting new possibilities for compact, high-performance designs with high data access throughput. However, the resulting higher power densities lead to thermal hotspots that need careful system level management. Dynamic Thermal Management strategies need to be carefully co-ordinated with voltage/frequency scaling and task mapping decisions to deliver the highest performance in the presence of thermal constraints. Advance knowledge of the nature of the processing, such as that in the neural network domain, leads to further improvements through application-specific customization of such decisions. Computation layers in convolutional neural networks can be characterised in terms of their memory access properties, and high-level information passed on to system management functions. We discuss recent research at IIT Delhi targeting these areas, along with the CoMeT simulation platform, a multi-institutional effort enabling the investigation of such scenarios.

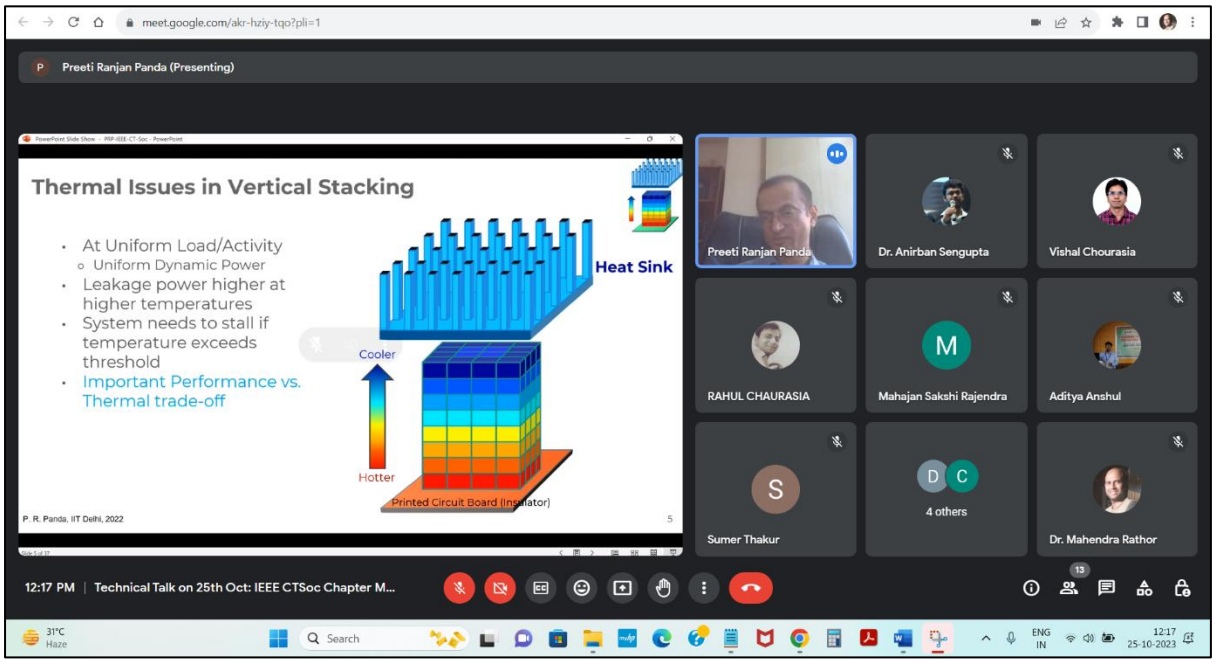
5. **Date and time:** October 25th, 2023, Time: 12:00 Noon IST

6. **Meeting Venue:** meet.google.com/akr-hziy-tqo

7. **Number of participants: 13**

8. **Event Photo:**


meet.google.com/akr-hziy-tqo?pli=1
Preeti Ranjan Panda (Presenting)
Emerging Memory Technologies
- Into the Third Dimension
Preeti Ranjan Panda
Professor
Dept. of Computer Science & Engineering; Khosla School of IT
Indian Institute of Technology Delhi
Presentation at IEEE CTSoc Chapter - MP section, 25 October 2023
Memory and embedded Architecture Research Group (MARG)
https://marg.iitd.ac.in
Preeti Ranjan Panda
Dr. Anirban Sengupta
Vishal Chourasia
RAHUL CHAURASIA
Mahajan Sakshi Raje...
Aditya Anshul
Sumer Thakur
3 others
Preeti Ranjan Panda joined
12:05 PM | Technical Talk on 25th Oct: IEEE CTSoc Chapter M...


meet.google.com/akr-hziy-tqo?pli=1
Preeti Ranjan Panda (Presenting)
Thermal Issues in Vertical Stacking
At Uniform Load/Activity
Uniform Dynamic Power
Leakage power higher at higher temperatures
System needs to stall if temperature exceeds threshold
Important Performance vs. Thermal trade-off
Heat Sink
Cooler
Hotter
Printed Circuit Board (Insulator)
P. R. Panda, IIT Delhi, 2022
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Preeti Ranjan Panda
Dr. Anirban Sengupta
Vishal Chourasia
RAHUL CHAURASIA
Mahajan Sakshi Rajendra
Aditya Anshul
Sumer Thakur
4 others
Dr. Mahendra Rathor
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