SIGDA News

1. AI Chip Market to Be Worth $67 Billion in 2024

The market analyst reckons the AI chip market will be worth US$53.4 billion in 2023, up by 20.9 percent from 2022 and increase by 25.6 percent in 2024 to $67.1 billion. By 2027, AI chips revenue is expected to be more than double the size of the market in 2023, reaching $119.4 billion.

2. AI demand Drives Nvidia's Booming Q2 Results

GPU chip company Nvidia Corp. (Santa Clara, Calif.) reported 2Q fiscal 2024 revenue that was double that of a year previously with profits increasing nine-fold.

3. Semiconductor market has turned the corner, Says analyst

The semiconductor market finally showed quarter-to-quarter growth in 2Q 2023, according to Semiconductor Intelligence referencing World Semiconductor Trade Statistics.

4. Inventory Up, Fab Utilization to Fall in 3Q23

Total IC inventory in the global chip sector is expected to climb and IC manufacturing capacity utilization is expected to fall in 3Q23, according to industry body SEMI.

5. SoftBank Prepares to File ARM IPO

The IPO is expected to take place on NASDAQ or the New York Stock Exchange as soon as September.

Messages from the EiCs

Dear ACM/SIGDA members,

We are excited to present to you September E-Newsletter. We encourage you to invite your students and colleagues to be a part of the SIGDA newsletter.

The newsletter covers a wide range of information from the upcoming conferences to technical news and activities of our community. Get involved and contact us if you want to contribute articles or announcements.

The newsletter is evolving. Please let us know what you think.

Happy reading!

Debjit Sinha, Keni Qiu,
Editors-in-Chief,
SIGDA E-News

6. [Intel Drops Tower Acquisition](#)

Leading US chipmaker Intel Corp. has canceled its plan to acquire speciality foundry Tower Semiconductor Ltd. (Migdal Haemek, Israel) citing failure to get regulatory approval as the reason. Intel will pay a termination fee of US$353 million to Tower.

7. [Huawei Plans to Use SMIC's 'Nearly-7nm' Process](#)

Huawei's lack of access to foundry TSMC forced the company to cease producing its own chips and phones in 2020. But now the company is working with leading Chinese foundry Semiconductor Manufacturing International Co. (SMIC) to put a 5G mobile chipset into mass production in the coming months, Nikkei said.

8. [Samsung, Apple to Push OLED Displays to TVs, Computers](#)

Overall the area demand for OLED displays will grow by 11.0 percent compound annual growth rate (CAGR) from 2022 to 2030, the market research firm has said. And the OLED market share in the smartphone display market has increased rapidly from 30 percent in 2020 to 42 percent in 2022. That share is expected to continue rising.

What is

Contributing author: Soonhoi Ha (Professor, Computer Science and Engineering Department, Seoul National University)

AE: Muhammad Shafique

What is a Service-Oriented IoT Platform?

As the IoT (Internet of Things) continues to gain prevalence in daily life, numerous IoT platforms have been developed to keep up with this growth [1]. An IoT platform is a software framework that facilitates the management and connectivity of various smart devices and applications over the network. It serves as a bridge between different layers of an IoT system, ranging from the device layer to the application layer. A device may be added by the user at any time or removed unexpectedly due to various factors such as power discharge, device failure, or network disconnection. Consequently, an IoT system can be regarded as a distributed and highly heterogeneous computing system with dynamically varying configurations.

Although the service-oriented IoT architecture has been studied for more than a decade[2], existing IoT platforms are primarily device-oriented. In a device-oriented platform, users directly control an IoT device to define an IoT application. Conversely, in a service-oriented platform, an IoT device is abstracted as a set of services it provides, and an IoT application is defined by a set of services requested by the user [3,4]. This abstraction allows the addition and utilization of new devices without modifying existing IoT applications. Service-oriented IoT has gained considerable attention in recent years. For instance, Samsung SmartThings [5] and openHAB [6] abstract a device with the services it offers, and users request services instead of directly accessing devices to create a new IoT application. However, since they do not permit multiple devices to share the same service name, they do not strictly adhere to the service-oriented approach.

In a service-oriented IoT system, an IoT application can be described as follows: "Take a picture when someone enters the room, and if it's a stranger, send me an email." This IoT application can be modeled using a directed graph, referred to as a service graph, in which nodes represent services and directed edges represent dependencies between them [4]. In this example, the following services can be identified and executed sequentially: motion detection, taking a picture, face detection, sending a mail. It is worth noting that face detection and email service can be performed by a cloud. Any computing resource, including a cloud, can be attached to the IoT platform by assigning each service provided by the computing resource to a virtual device.

One crucial function of the IoT middleware in a service-oriented IoT platform is to schedule the required services to devices [7,8]. Since multiple IoT applications can run in parallel, and the status of devices may change dynamically, it is necessary to dynamically map and schedule services to devices at runtime, considering real-time constraints imposed by applications. When a new application enters the IoT system, it is essential to check if the required services can be executed and if the real-time constraints can be met before accepting the application. Thus, the primary objective of scheduling is to accommodate as many IoT applications as possible while satisfying real-time constraints. Additionally, other objectives such as energy minimization and device life maximization may be taken into consideration.

In summary, a service-oriented IoT platform raises an intriguing real-time scheduling problem of IoT applications onto the IoT system that is a distributed computing system with dynamically varying configurations. Due to the need to consider service dependencies, device heterogeneity,

Xun Jiao,
AE for What is

Muhammad Shafique,
AE for What is

Rajsaktish Sankaranarayanan,
AE for Researcher spotlight

Xin Zhao,
AE for Paper submission

Ying Wang,
AE for Technical activities

Jiaqi Zhang,
AE for Technical activities

Paper Deadlines

HOST'24 – IEEE Int'l Symposium on Hardware-Oriented Security and Trust
Washington DC
Deadline (fall submission):
 Aug. 28, 2023
Abstracts due: Aug. 21, 2023
Deadline (winter submission):
Dec. 18, 2023
Abstracts due: Dec. 11, 2023
May , 2024
http://www.hostsymposium.org

ISSCC'24 – IEEE Int'l Solid-State Circuits Conference
San Francisco, CA
Deadline: Sept. 6, 2023
Feb. 18-22, 2024
http://isscc.org

DATE'24 - Design Automation and Test in Europe
Valencia, Spain
Deadline: Sept. 17, 2023 (Abstracts due: Sept. 10, 2023)

real-time constraints, and resource contentions, this is a highly challenging problem that requires further research in the future.

References

[1] IoTAnalystics, Iot platform companies landscape 2021/2022: Market consolidation has started (2021).
URL https://iot-analytics.com/iot-platform-companies-landscape

[2] T. Teixeira, S. Hachem, V. Issarny, N. Georgantas, Service oriented middleware for the internet of things: A perspective, in: Towards a Service-Based Internet: 4th European Conference, ServiceWave 2011, Poznan, Poland, October 26-28, 2011. Proceedings 4, Springer, 2011, pp. 220–229.

[3] F. Bakir, R. Wolski, C. Krintz, G. S. Ramachandran, {Devices-as-Services}: Rethinking scalable service architectures for the internet of things, in: 2nd USENIX Workshop on Hot Topics in Edge Computing (HotEdge 19), 2019. 35

[4] H. Lee, E. Jeong, D. Kang, J. Kim, S. Ha, A novel service-oriented platform for the internet of things, in: Proceedings of the Seventh International Conference on the Internet of Things, 2017, pp. 1–8.

[5] Samsung, Smartthings developer documentation (2022). URL https://developer.smartthings.com

[6] F. Heimgaertner, S. Hettich, O. Kohlbacher, M. Menth, Scaling home automation to public buildings: A distributed multiuser setup for open-hab 2, in: 2017 Global Internet of Things Summit (GIoTS), IEEE, 2017, pp. 1–6.

[7] Li L, et al. (2014) Qos-aware scheduling of services-oriented internet of things. IEEE Transactions on Industrial Informatics 10(2):1497–1505, DOI 10.1109/TII.2014.2306782

[8] J. Kim, K. Park, H. Yang, S. Ha, Adaptive run-time scheduling of dependent services for service-oriented IoT systems, Design Automation for Embedded Systems 25 (4) (2021) 265–295.

SIGDA Awards

1. Award Winners @ ISLPED 2023

http://www.islped.org/2023/

Track 1: Technology, Circuits, and Architecture

"CoolDRAM: An Energy-Efficient and Robust DRAM"
Nezam Rohbani (1), Mohammad Arman Soleimani (2) and Hamid Sarbazi-Azad (2)
(1) Institute for Research in Fundamental Sciences (IPM) (2) Sharif University of Technology

Track 2: EDA, Systems, and Software

"Uncertainty-aware Online Learning for Dynamic Power Management in Large Manycore systems"

Mar. 25-27, 2024
http://www.date-conference.com

ISPD'24 – ACM Int'l Symposium on Physical Design
Taipei, Taiwan
Deadline: Sept. 30, 2023
Abstracts due: Sept. 24, 2023
Mar. 12-15, 2024
http://www.ispd.cc

ISQED'24 - Int'l Symposium on Quality Electronic Design
San Francisco, CA
Deadline: Sept. 29, 2023
Apr. 3-5, 2023
http://www.isqed.org

FPGA'24 – ACM/SIGDA Int'l Symposium on Field-Programmable Gate Arrays
Monterey, CA
Deadline: Oct. 13, 2023 (Abstracts due: Oct. 6, 2023)
Mar. 3 - 5, 2024
http://www.isfpga.org

ISCAS'24 – IEEE Int'l Symposium on Circuits and Systems
Singapore
Deadline: Oct. 15, 2023
May 19-22, 2024
http://iscas2024.org

Upcoming Conferences

MLCAD'23 - ACM/IEEE Workshop on Machine Learning for CAD
Snowbird, Utah
Sept. 11-13, 2023
https://mlcad-workshop.org/

Gaurav Narang (1), Raid Ayoub (2), Michael Kishinevsky (2), Jana Doppa (1) and Partha Pratim Pande (1)
(1) Washington State University (2) Intel Corporation

Track 3: Crosscutting Themes (AI/ML Hardware & Hardware Security)

"LAXOR: A Bit-Accurate BNN Accelerator with Latch-XOR Logic for Local Computing"
Dongrui Li (1), (2), Tomomasa Yamasaki (1), Niangjun Chen (1), Mani Aarthy (2), Anh Tuan Do (2), and Bo Wang (1)
(1) Singapore University of Technology & Design (SUTD) (2) Institute of Microelectronics (IME), Agency for Science, Technology and Research (A*STAR)

Design Contest Award

"SmartHeaP - A High-level Programmable, Low Power, and Mixed-Signal Hearing Aid SoC in 22nm FD-SOI"
Jens Karrenbauer, Simon Klein, Sven Scho¨newald, Lukas Gerlach, Meinolf Blawat, Jens Benndorf, Holger Blume
Leibniz University, Hannover

SIGDA Partner Journal

ACM Transactions on Design Automation of Electronic Systems, TODAES, publishes innovative work documenting significant research and development advances on the specification, design, analysis, simulation, testing, and evaluation of electronic systems, emphasizing a computer science/engineering orientation. Design automation for machine learning/AI and machine learning/AI for design automation are very much welcomed.

If you are an active researcher in the design and design automation field and would like to be part of the TODAES review board, please fill out the following reviewer form. TODAES recognizes those reviewers that provide timely and high-quality reviews through the Distinguished Review Board. TODAES also recognizes papers and outstanding junior researchers through best paper and rookie of the year award. Authors can send their paper submissions on the manuscript portal.

TODAES welcomes special issue proposals from leading researchers/practitioners. Such proposals should be emailed to Joerg Henkel, Senior Associate Editor, at joerg.henkel@kit.edu.

ESWEEK'23 - Embedded Systems Week
Hamburg, Germany
Sept. 17-22, 2023
http://www.esweek.org

NOCS'23 – IEEE/ACM Int'l Symposium on Networks-on-Chip (co-located with ESWEEK 2023)
Hamburg, Germany
Sept. 21-22, 2023
https://nocs2023.github.io

MEMOCODE'23 - IEEE/ACM Int'l Conference on Formal Methods and models for System Design (co-located with ESWEEK 2023)
Hamburg, Germany
Sept. 21-22, 2023
https://memocode2023.github.io

VLSI-SoC'23 – IFIP/IEEE Int'l Conference on Very Large Scale Integration
Dubai, UAE
Oct. 16-18, 2023
http://www.vlsi-soc.com

BioCAS'23 – Biomedical Circuits and Systems Conference
Toronto, Canada
Oct. 19-21, 2023
https://2023.ieee-biocas.org/

PACT'23 - Int'l Conference on Parallel Architectures and Compilation Techniques
Vienna, Austria
Oct. 21-25, 2023
http://www.pactconf.org

MICRO'23 – IEEE/ACM Int'l Symposium on Microarchitecture
Toronto, Canada
Oct. 28 - Nov. 1, 2023
http://www.microarch.org/micro56

ICCAD'23 – IEEE/ACM Int'l Conference on Computer-Aided Design

Technical Activities

1. [Meta's Llama 2 Helps MediaTek Enhance On-Device Generative AI in Edge Devices](#)

MediaTek Inc. is working closely with Meta's Llama 2, the company's next-generation open-source Large Language Model (LLM), to build a complete edge computing ecosystem designed to accelerate AI application development on smartphones, IoT, vehicles, smart home, and other edge devices…

2. [HBM Bit Supply Projected to Soar by 105% in 2024 as Suppliers Boost Production](#)

Memory suppliers are boosting their production capacity in response to escalating orders from NVIDIA and CSPs for their in-house designed chips. These efforts include the expansion of TSV production lines to increase high bandwidth memory (HBM) output. According to TrendForce, current production plans from suppliers indicate a remarkable 105% annual increase in HBM bit supply by 2024…

3. [New Silicon Labs Platform Chases Big AI/ML Compute Gain](#)

In the dash to make everything smart, device makers are continually striving to put more intelligence and connectivity at the edge, and that has accelerated massively as we move toward making the "tiny" edge—at sensor level—more intelligent by adding more and more machine learning (ML) and AI capability to process the data or images without having to move it to a CPU or to the cloud…

4. [Arm's SystemReady 2.0 to Secure IoT Devices](#)

For OEMs developing connected devices, ensuring those will be secure over a long period is one of the most important considerations. On a connected computing device, such as a laptop, server, smartphone or tablet, receiving software updates, including security patches, is a regular thing. This is different for the billions of IoT devices deployed worldwide. Arm's SystemReady is a compliance certification program based on hardware and firmware standards…

San Francisco, CA
Oct 29 - Nov 2, 2023
https://iccad.com/

ICCD'23 – IEEE Int'l Conference on Computer Design
Washington DC, US
Nov. 6-8, 2023
http://www.iccd-conf.com

FPT'23 - Int'l Conference on Field-Programmable Technology
Yokohama, Japan
Dec. 11-14, 2023
http://icfpt.org

HiPC'23 – IEEE Int'l Conference on High Performance Computing, Data, And Analytics
Goa, India
Dec. 18-21, 2023
http://www.hipc.org

iSES'23 – IEEE Int'l Symposium on Smart Electronic Systems
Ahmedabad, India
Dec. 18-20, 2023
http://www.ieee-ises.org

ASP-DAC'24 - Asia and South Pacific Design Automation Conference
Incheon Songdo Convensia, South Korea
Jan. 22-25, 2024
http://www.aspdac.com

VLSID'24 – International Conference on VLSI Design & International Conference on Embedded Systems
ITC Royal Bengal, Kolkata, India
Jan. 6-10, 2024
https://vlsid.org/

Job Positions

1. New Age Makers Institute of Technology, India

Job Title: Faculty Positions in Artificial Intelligence, Machine Learning, Robotics, Internet of Things, CAD/CAM, Advanced Manufacturing

Description: New Age Makers Institute of Technology is currently accepting applications for Professors, Associate Professors, Assistant Professors, Professors of Practice, and Visiting Faculty across the following disciplines: Artificial Intelligence | Machine Learning | Robotics | Internet of Things | CAD/CAM | Data Analytics | Advanced Manufacturing Processes | Cyber Security | Mechatronics | Product Design | Additive Manufacturing. Qualification and Work Experience for Full-Time Roles: Ph.D in appropriate disciplines from reputed national and international universities, first Division in B.Tech and M.Tech, teaching or industry experience as per UGC norms, preference would be given to industry exposure or experience at Institutes of Eminence. For more information, please refer to:
https://professorpositions.com/faculty-positions-in-artificial-intelligence-machine-learning-robotics-internet-of-things-cadcam-advanced-manufacturing,i37218.html.

2. University of Cambridge, UK

Job Title: Assistant/Associate Professor of Electrical Engineering

Description: We are seeking an individual to develop and deliver teaching material in digital electronics and VLSI design specifically. The ability to teach in other areas within the field of electrical and electronic engineering would be advantageous. It is anticipated that the majority of teaching will be at undergraduate level, although some teaching at postgraduate level is also expected, including the possibility of assisting with the development of a new course at Master's level. Applicants are be expected to have been educated to PhD level or have related equivalent experience. A strong technical knowledge in electronic engineering and specifically in digital electronics, VLSI design and hardware description languages is essential as well as a proven track record of teaching delivery and the design of teaching materials at undergraduate level. A high level of spoken and written communication skills is also expected. For more information, please refer to:
https://facultyvacancies.com/assistantassociate-professor-of-electrical-engineering,i36440.html.

3. Florida Institute of Technology, US

Job Title: Professor of Electrical Engineering

Description: The Department of Electrical Engineering and Computer Science (EECS) at Florida Tech invites applications for multiple tenure-track faculty positions in electrical engineering beginning August 2023. Preference is for the Assistant Professor level, but other levels will be considered. Required qualifications for the position include an earned Ph.D. in electrical engineering, computer engineering, or a closely related field. Successful candidates are expected to perform undergraduate and graduate teaching, pursue an active research program, and advise undergraduate and graduate students. Moreover, candidates should have an established record of outstanding-quality research publications and a commitment for excellence in teaching. Strong oral and written communication skills are required. While all candidates will be considered, emphasis is on those applicants with teaching and research experience in electric/electronic circuits, analog and digital electronics, photonics, semiconductor devices, or control systems. For more information, please refer to:
https://facultyvacancies.com/professor-of-electrical-engineering,i36219.html.

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