Special Interest Group on Design Automation
ACM/SIGDA E-NEWSLETTER, Vol. 52, No. 6

SIGDA - The Resource for EDA Professionals

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Circulation: 2,700

Online archive: http://www.sigda.org/newsletter

SIGDA News

1. [India Prepares to Build Nation's First Chip Fab](#)
India is edging toward the construction of its first IC fab in the southwestern state of Karnataka following ISMC's recent announcement.

2. [GF, DoD Announce $117 Partnership to Secure U.S. Critical Chips](#)
GlobalFoundries (GF) last week announced a $117 million partnership with the U.S. Department of Defense (DoD), in which the chipmaker will assist the DoD in resupplying critical U.S.–made semiconductors for national security systems.

3. [SMIC Revenue Soars as Chinese Market Sours](#)
Semiconductor Manufacturing International Corp. (SMIC) saw sales grow by more than 66% in the first three months of this year as the company warned of weakening demand in China, its home market.

4. [Samsung, Stellantis to Invest $2.5 Billion in U.S. EV Battery Plant](#)
Samsung SDI and Stellantis this week have agreed to invest more than $2.5 billion in an electric vehicle (EV) battery plant in the car manufacturing rustbelt of the U.S. as the nation's automobile industry starts to electrify.

5. [AMD Predicts Revenue to Grow by 60% in 2022](#)
Following strong demand for processors used in servers as well as the contribution from its acquisition of field programmable gate

Messages from the EiCs

Dear ACM/SIGDA members,

We are excited to present to you June 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

array (FPGA) maker Xilinx, AMD predicts its target annual revenue will grow by 60% in 2022.

6. [Samsung Profit Soars on Memory Chip Demand](#)
Samsung Electronics, the world's largest memory chipmaker, saw its profit in the first quarter of 2022 jump by more than 50% on strong demand for memory in data centers.

7. [Foundry's 31% Growth in 2021 Outpaced Overall Chip Industry](#)
The 31% increase in chip foundry revenue to $100.2 billion led growth in the overall semiconductor industry last year, according to market research firm Gartner. The increase in foundry sales was primarily due to an 11.5% rise in average selling prices for silicon wafers and an 18% jump in unit shipments.

What Is

What is Relational Join on Many-core Systems?

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As the span of data intensive computing applications, research thrust knits the areas of database systems and high-performance computing, with a focus on novel DBMS architectures that utilize modern hardware such as many-core systems. Towards high-throughput large-scale scientific data management, the vision is to architect a DBMS that maximizes resource sharing among applications issued from different users. Specifically, such system adopts a novel set of data processing operators as a new engine and fully utilize new parallel-computing hardware systems to satisfy the tremendous I/O and computational demands of next-generation scientific applications. Following this trend, the very first task is **to build relational joins on many-core systems**.

Operator-level optimizations on new hardware attempt to improve to improve the performance of individual database operators on

single or multiple processing units. The database architecture encapsulates concurrent query processing and system maintenance tasks into sequential file-scan operations, thus alleviating the main performance bottleneck in traditional DBMSs - I/O throughput. On the other hand, to keep up with the high data arrival rate, modern hardware such as GPUs are promising platforms for data processing. The research of relational joins on many-core systems covers a series of subtopics including parallel algorithms for processing relational operators, support of concurrent parallel computational kernels, spatial indexing, memory management, resource allocation, and data stream processing.

Significant effort has been put through into optimizing compute and data intensive operators like joins. The first few prototypes of operator-level optimization on a typical many-core system is a GPU-based fast relational joins, such as in-core and out-of-core joins. He et al. designed several GPU-based database operators and join algorithms [1] that take advantage of early generations of CUDA-enabled GPUs. Rui et al. further improved join performance on GPUs by designing novel algorithms that take advantage of hardware and software features in newer generations of GPUs [2]. Yuan et al. studied the potentiality of GPUs for data warehouse use cases and provided insights on reducing the overhead caused by slow data transfer speed of the GPU [3]. All these focus on the in-core processing of a target many core system.

Current studies rarely address the issue of distributed operations across many devices or sites. The earliest study can be traced back to [4], which utilizes Unifed Virtual Addressing (UVA) for controlling data transfer in early generations of GPUs. More recent work studied the performance in out-of-core join processing on GPUs [5]. Based on which, Xu et al. builds an elastic service on many heterogeneous sites [6]. To batch it up, Eslaimi et al. proposes a PsiDB system as a framework for operation-level optimization [7]. All studies set a computation foundation for scientific applications, such as Marine Science [8,9], Machine Learning [10], etc.

In summary, the technique for DBMS on new hardware is an emerging area for database and architecture research and there are a handful of proposals and systems from both academia and industry. The interest on this topic has gained a lot of momentum that calls for a full stack effort from piling higher applications to dig deeper architectural design and automation.

Xunzhao Yin,
AE for Awards

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

Paper Deadlines

MEMOCODE'22 - IEEE/ACM Int'l Conference on Formal Methods and models for System Design (co-lcated with ESWEEK 2022)
Hybrid Conference
Shanghai, China
Deadline: June 3, 2022
(Abstracts due: May 27, 2022)
Oct 13-14, 2022
https://memocode2022.github.io

BioCAS'22 – Biomedical Circuits and Systems Conference
Taipei, Taiwan
Deadline: June 10, 2022
Oct 13-15, 2022
https://2022.ieee-biocas.org/

ICCD'22 – IEEE Int'l Conference on Computer Design
Lake Tahoe
Deadline: June 11, 2022
(Abstracts due: June 4, 2022)
Oct 23-26, 2022
http://www.iccd-conf.com

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[2] Rui, Ran, Hao Li, and Yi-Cheng Tu. "Efficient join algorithms for large database tables in a multi-GPU environment." *Proceedings of the VLDB Endowment* 14, no. 4 (2020): 708-720.

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[6] Xu, Zichen, Christopher Stewart, Nan Deng, and Xiaorui Wang. "Blending on-demand and spot instances to lower costs for in-memory storage." In *IEEE INFOCOM 2016-The 35th Annual IEEE International Conference on Computer Communications*, pp. 1-9. IEEE, 2016.

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[10] Du, Yunxiao, Zichen Xu, Kanqi Zhang, Jie Liu, Jiangcheng Huang, and Christopher Stewart. "Cost-effective Strong Consistency on Scalable Geo-diverse Data Replicas." *IEEE Transactions on Cloud Computing*, 2022.

HiPC'22 – IEEE Int'l Conference on High Performance Computing, Data, And Analytics
Deadline: June 24, 2022
(Abstracts due: June 10, 2022)
Dec 18-21, 2022
http://www.hipc.org

MLCAD'22 - ACM/IEEE Workshop on Machine Learning for CAD
Snowbird, Utah
Deadline: Jul 1, 2022
Sep 12 - 13, 2022
https://mlcad-workshop.org/

FPT'22 - Int'l Conference on Field-Programmable Technology
Hybrid: Hong Kong, China
Deadline: Jul 15, 2022
(Abstracts due: Jul 8, 2022)
Dec 5-9, 2021
http://icfpt.org

ASP-DAC'23 - Asia and South Pacific Design Automation Conference
Miraikan, Tokyo, Japan
Deadline: Jul 29, 2022
(Abstracts due: Jul 24, 2022)
Jan 16-19, 2023
http://www.aspdac.com

iSES'22 – IEEE Int'l Symposium on Smart Electronic Systems
Warangal, India
Deadline: Aug 1, 2022
Dec 19-21, 2022
http://www.ieee-ises.org

WOSET'22 - Workshop on Open-Source EDA Technology (virtually co-located with ICCAD 2022)
San Diego, CA
Deadline: Sept. 1, 2022
Nov 3, 2022
https://woset-workshop.github.io

Who's Who

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Technical Activities

1. At IOTSWC, Bill Hoffman talks about Responsible Computing and Digital Twin

The Object Management Group (OMG), co-organizers of the IoT Solutions World Congress, launched the new Responsible Computing Consortium to address the current and future challenges in computing, including sustainability, ethics, and professionalism…

2. u-blox Unveils MAYA-W2 Tri-Radio Module for IoT Applications

U-blox, a Swiss positioning and wireless technology provider, announced it has launched MAYA-W2 to solve the integration problem caused by the presence of multiple protocols. The product is a compact tri-radio module capable of supporting Wi-Fi 6, Bluetooth, and the IEEE 802.15.4 (Thread and Zigbee). The module supports both Bluetooth classic and Bluetooth Low Energy (LE)…

3. Why Broadcom is Acquiring VMware

Is Broadcom acquiring a cash cow or building a vertical stack of components from processor to application? The latter could be

ISSCC'23 – IEEE Int'l Solid-State Circuits Conference
San Francisco, CA
Deadline: Sept 7, 2022
Feb 19-23, 2023
http://isscc.org

DATE'23 - Design Automation and Test in Europe
Antwerp, Belgium, and online
Deadline: Sept 25, 2022
(Abstracts due: Sept 18, 2022)
Apr 17-19, 2023
http://www.date-conference.com

Upcoming Conferences

GLSVLSI'22 – ACM Great Lakes Symposium on VLSI
Orange County, CA
June 6-8, 2022
http://www.glsvlsi.org

OSCAR'22 - First Workshop on Open-Source Computer Architecture Research
New York (co-located with ISCA 2022)
June 11, 2022
https://oscar-workshop.github.io/

ISCA'22 – Int'l Symposium on Computer Architecture
New York City, USA
June 11-15, 2022
https://iscaconf.org/isca2022/

LCTES'22 – ACM Int'l Conference on Languages Compilers, Tools and Theory of Embedded Systems
San Diego, CA
June 14, 2022

highly transformative, but the question of how effective a full stack strategy....

4. [Open Source EDA, IP, Cloud-Based Design, Extending Moore's Law:](#)

Pedestal Research's Laurie Balch Talks Chip Design Trends...

Job Openings

1. University of Surrey, United Kindom

Job Title: Head of School of Computer Science and Electronic Engineering

Description: As our new Head of School, you will have full responsibility for the resource allocation model and evolution of the School structure. You will facilitate a dynamic and forward-looking environment to develop and deliver the School's academic and strategic plans, leading and supporting academic staff to achieve the highest standards in research, teaching and professional conduct. Reflecting our continual investment in the best academic staff and facilities, our successful research programmes build on our strong collaborative links with industry partners and our position as a leading research hub in areas such as space satellites, nanotechnology, and biomedical engineering. Alongside a comprehensive understanding of contemporary higher education, you will bring broad-based experience of visible and inclusive senior leadership, as well as effective management of people and resources. A proven track record of assuring and delivering high-quality research performance and an excellent student experience is essential, as is a strong alignment with the University's mission, vision, and values. Applicants are welcome to contact Samantha Francis, Resourcing Specialist (samantha.francis@surrey.ac.uk) for further information or to arrange a preliminary conversation with Prof Bob Nichol, Pro-Vice-Chancellor, Dean, FEPS at the University of Surrey.

2. Royal Institute of Technology School of Electrical Engineering and Computer Science Sweden

Job Title: Assistant professor in in Machine Learning and Autonomous Systems

https://pldi22.sigplan.org/home/LCTES-2022

HiPEAC'22: Int'l Conference on High Performance Embedded Architectures & Compilers
Budapest, Hungary
June 20-22, 2022
https://www.hipeac.net/2022/budapest/

HOST'22 – IEEE Int'l Symposium on Hardware-Oriented Security and Trust
Washington DC
June 27-30, 2022
http://www.hostsymposium.org

ISVLSI'22 – IEEE Computer Society Annual Symposium on VLSI
Cyprus
July 4-6, 2022
http://www.ieee-isvlsi.org

ICDCS'22 – IEEE Int'l Conference on Distributed Computing Systems
Bologna, Italy
Jul 10 - 13, 2022
https://www.icdcs.org/

DAC'22 – Design Automation Conference
San Francisco, CA
July 10-14, 2022
http://www.dac.com/

IWLS'22 - International Workshop on Logic & Synthesis
Virtual conference
Jul 18-21, 2022
https://www.iwls.org

ISLPED'21 – ACM/IEEE Int'l Symposium on Low Power Electronics and Design
Boston University, Boston, MA (Hybrid)
Aug 1-3, 2022
http://www.islped.org

Description: Wallenberg AI, Autonomous Systems and Software Program (WASP) is Sweden's largest individual research program ever, a major national initiative for strategically motivated basic research, education and faculty recruitment. The program addresses research on artificial intelligence and autonomous systems acting in collaboration with humans, adapting to their environment through sensors, information and knowledge, and forming intelligent systems-of-systems. The vision of WASP is excellent research and competence in artificial intelligence, autonomous systems and software for the benefit of Swedish industry. Your application should follow KTH's CV template for employment of teachers. It is the responsibility of the applicant to ensure that the application is complete according to the requirements in the ad and CV template. Your complete application must be received at KTH no later than the last day of application, midnight CET/CEST (Central European Time/Central European Summer Time). Log into KTH recruitment system in order to apply to this position.

3. Hong Kong University of Science and Technology Hong Kong

Title: Faculty Positions in Electronic and Computer Engineering

Description: The School of Engineering at HKUST has launched an aggressive global search to attract internationally renowned scholars and their teams to work in Hong Kong. Distinguished applicants at the rank of Professor or Associate Professor joining the School will be considered for the nomination of the Global STEM Professorship Scheme supported by the Hong Kong Government, which offers additional support to aid the awardees to scale new heights in teaching and research activities. Applicants should have a PhD with demonstrated strength in research and commitment to teaching. Successful candidates are expected to lead active research programs and teach both graduate and undergraduate courses. An interdisciplinary knowledge and application of different disciplines will be an advantage. Applications including 1) a cover letter, 2) full curriculum vitae and a list of publications, 3) names of five referees, and 4) a summary of research proposal and teaching statement should be submitted via the HKUST recruitment system: facrecruit.hkust.edu.hk. The applicants should first sign up to create a personal account. Applications are accepted at any time and considered on a rolling basis. HKUST is an equal opportunities employer and is committed to our core values of inclusiveness, diversity, and respect.

VLSI-SoC'22 – IFIP/IEEE Int'l Conference on Very Large Scale Integration
Patras, Greece
Oct 3-5, 2022
http://www.vlsi-soc.com

NOCS'22 – IEEE/ACM Int'l Symposium on Networks-on-Chip (co-located with ESWEEK 2022)
Hybrid Conference. Shanghai, China
Oct 7-14, 2022
https://nocs2022.github.io

ESWEEK'22 - Embedded Systems Week (CASES, CODES+ISSS, and EMSOFT)
Hybrid Conference. Shanghai, China
Oct 7-14, 2022
http://www.esweek.org

PACT'22 - Int'l Conference on Parallel Architectures and Compilation Techniques
Chicago, IL
Oct 10-12, 2022
http://www.pactconf.org

MICRO'22 – IEEE/ACM Int'l Symposium on Microarchitecture
Chicago, IL
October, 2022
http://www.microarch.org/micro55

ICCAD'22 – IEEE/ACM Int'l Conference on Computer-Aided Design
Hybrid in-person and virtual conference
Oct 30 - Nov 3, 2022
http://www.iccad.com

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