



Special Interest Group on Design Automation

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SIGDA - The Resource for EDA Professionals

This newsletter is a free service for current SIGDA members and is added automatically with a new SIGDA membership.

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Newsletter format poll

We are in the process of updating the E-newsletter and would like to have your feedback on which format you would like to receive and read it. The sample formats are available at <https://pan.baidu.com/s/1uKpKgH4vuNfj-y61K7zqQA> (Passcode: 1234). Here is a [tiny poll](#) and your feedback will be very helpful for us as we move forward. Thank you for your time to take the poll, this should not take more than a few seconds.

SIGDA News

1. [Spin-Orbit-Torque Tackles MRAM Constraints](#)

The next generation of embedded MRAM (magneto-resistive RAM) may boil down to changing the order of ingredients in the recipe.

2. [National Lab Achieves Big Step in Fusion Research](#)

The National Ignition Facility (NIF) at Lawrence Livermore National Laboratory created a reaction that produced 70% of the energy necessary to sustain fusion: 1.35 megajoules (MJ). Although this is far less than what a laser fusion power source would require (1.9 MJ), the result is highly encouraging because it is 8x more powerful than what the lab had previously achieved.

3. [Foxconn Enters Chip Production with Macronix Deal](#)

Foxconn, the world's largest assembler of consumer devices such as Apple's iPhone, is entering semiconductor production as part of a plan to expand into electric vehicles.

Dear ACM/SIGDA members,

We are excited to present to you October 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 and hot research topics to technical news and activities from our community. Get involved and contact us if you want to contribute an article or announcement. Please take a minute of your time and complete the format poll in this newsletter - We value your feedback. Happy reading!

Debjit Sinha, Keni Qiu,
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4. [Energy Harvesting Startups Could Power Some IoT Dreams](#)

There is a growing number of new companies that aim to extract small amounts of energy from environmental sources. This generation of energy harvesting startups is largely focused on delivering power for the plethora of IoT sensors around today.

What Is column

What is AI-assisted Placement?

*Yibo Lin,
Assistant Professor,
Computer Science Department,
Peking University*

Placement is a classic problem in integrated circuit (IC) design. It determines the physical locations of standard cells (or equivalently logic gates) and macros (e.g., IP and memory blocks) in a physical layout [1]. With increasing design complexities and complicated design constraints in advanced technology nodes, placement is becoming a challenging task that requires cross-layer optimization.

Typical metrics to quantify the quality of a placement solution include wirelength, routability, timing, power, and so on [1, 2, 3, 4]. However, some of these metrics cannot be accurately obtained in placement. For instance, only after routing, we know whether a placement solution is routable or not. Accurate timing evaluation also needs routing and timing analysis. Therefore, cross-layer information is demanded to guide placement optimization.

Obtaining cross-layer information usually requires iteratively run time-consuming steps like routing and timing analysis, which is too expensive. Recently, AI-assisted placement is being actively explored for cross-layer optimization with machine learning models for cross-layer evaluation. Take routability optimization as an example. Many studies have proposed rather accurate neural network models to predict routing congestions during placement [5, 6, 7]. Some of them even integrate the model into state-of-the-art placers to guide the placement engines [7, 8, 9], eventually resulting in up to 5-7% reduction in routed wirelength

*Shafique Muhammad, AE for What is
Qinru Qiu, AE for Live
Yiyu Shi, AE for Live
Rajsaktish
Sankaranarayanan, AE for
Researcher spotlight
Xin Zhao, AE for Paper
submission deadline
Ying Wang, AE for Technical
activities*

Paper deadlines

ISPD'22 – ACM Int'l Symposium
on Physical Design
Banff, Alberta, Canada
Deadline: Oct 8, 2021
(Abstracts due: Oct 1, 2021)
Mar 27 - 30, 2022
<http://www.ispd.cc>

VLSID'22 – International
Conference on VLSI Design &
International Conference on
Embedded Systems
Virtual Conference
Deadline: Oct 22, 2021
Feb 19-23, 2022
[http://embeddedandvlsidesign
conference.org](http://embeddedandvlsidesignconference.org)

ISCAS'22 – IEEE Int'l
Symposium on Circuits and
Systems
Austin, TX
Deadline: Oct 25, 2021
May 28 - June 1, 2022
<http://iscas2022.org>

RTAS'22 - IEEE Real-Time and
Embedded Technology and
Applications Symposium
Milano, Italy

or fewer design rule violations after routing due to improved routability.

Besides assisting cross-layer optimization, studies like DREAMPlace leverage deep learning toolkits such as PyTorch to develop placement solvers, for the analogy between the fundamental problems of neural network training and placement solvers [10]. With the native support for GPU acceleration, more than 30\times speedup over multi-thread CPU implementations has been achieved without performance degradation. This line of studies has stimulated multiple related advances in exploring effective placement techniques that are originally unaffordable due to the efficiency issue [9, 11].

In summary, although placement is a classic problem, it evolves rapidly with design complexities and technology nodes. AI-assisted placement is a promising direction to enable efficient and effective cross-layer optimization to satisfy the emerging design constraints.

References

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Deadline: Oct 29, 2021
May 4-6, 2022
<http://2022.rtas.org>

ISCA'22 – Int'l Symposium on
Computer Architecture
New York City, USA
Deadline: Nov 23, 2021
(Abstracts due: Nov 16, 2021)
June 11-15, 2022
<https://iscaconf.org/isca2022>

FCCM' 22 - IEEE International
Symposium On
Field-Programmable Custom
Computing Machines
New York
Deadline: Jan 10, 2022
(Abstracts due: Jan 3, 2022)
May 15–18, 2022
<https://www.fccm.org/>

Upcoming conferences

VLSI-SoC'21 – IFIP/IEEE Int'l
Conference on Very Large Scale
Integration
Virtual conference
Oct 4-8, 2021
<http://www.vlsi-soc.com>

BioCAS'21 – Biomedical
Circuits and Systems
Conference
Berlin, Germany
Oct 7-9, 2021
<https://2021.ieee-biocas.org>

ESWEEK'21 - Embedded
Systems Week (CASES,
CODES+ISSS, and EMSOFT)
Virtual Conference
Oct 10-15, 2021

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<http://www.esweek.org>

NOCS'21 – IEEE/ACM Int'l Symposium on Networks-on-Chip (co-located with ESWEEK 2021) Virtual Conference Oct 14-15, 2021 <https://nocs2021.github.io>

MICRO'21 – IEEE/ACM Int'l Symposium on Microarchitecture Athens, Greece Oct 16-20, 2021 <http://www.microarch.org/micro54>

ICCD'21 – IEEE Int'l Conference on Computer Design Virtual Conference Oct 24-27, 2021 <http://www.iccd-conf.com>

BodyNets'21 – Int'l Conference on Body Area Networks Virtual Conference Oct 25-26, 2021 <http://www.bodynets.org>

ICCAD'21 – IEEE/ACM Int'l Conference on Computer-Aided Design Virtual Conference Nov 1-4, 2021 <http://www.iccad.com>

WOSET'21 - Workshop on Open-Source EDA Technology (virtually co-located with ICCAD 2021) San Diego, CA Nov 4, 2021 <https://woset-workshop.github.io>

2nd ROAD4NN Workshop: Research Open Automatic Design for Neural Networks (Co-located with DAC 2021) San Francisco, CA

Technical activities

1. [Chiplet Strategy is Key to Addressing Compute Density Challenges](#)

Chiplet integration can enable disaggregated server, heterogeneous computing and domain-specific acceleration within data centers...

2. [Enabling 5G and the Future of Robotics Enabling 5G and the Future of Robotics](#)

Learn how robots can be precisely controlled dynamically in near real-time, and be connected to people and machines locally and globally...

3. [How to Stop Disposable Batteries and Foster the Energy-Harvesting Era](#)

How do we deal with the toxic waste in batteries? The solution is energy harvesting from ambient sources...

Job Openings

1. New Mexico State University, United States

Job Title: Assistant/Associate/Full Professor in Electrical and Computer Engineering

Description: The Klipsch School of Electrical and Computer Engineering at New Mexico State University invites applications

for one or more tenure-track faculty positions at the rank of Professor, Associate Professor, and Assistant Professor. Applicants should have a Ph.D. in electrical engineering or a closely related field, a strong publication record, and are expected to show significant potential to create an internationally recognized funded research program. The department will consider exceptional candidates in all electrical and computer engineering areas but is particularly interested in candidates whose primary research expertise is in artificial intelligence/machine learning, microelectronics/VLSI, photonics, energy/power systems, and quantum information sciences. Applicants whose research areas can support interdisciplinary research endeavors are at an advantage. The successful candidate is also expected to demonstrate a solid commitment to teaching at both the undergraduate and graduate levels. The Klipsch School has 20 tenure-track faculty positions and a current enrollment of approximately 250 undergraduate students, 110 MS students, and 25 Ph.D. students. Applicants for the position should apply online at <https://jobs.nmsu.edu/postings/41916>. The application packet should consist of a cover letter, curriculum vitae, research statement, teaching statement, and names and contact information of three references. Optionally, applicants may attach up to three key publications. Review of applications will begin September 1, 2021 and will continue until the positions are filled. For more information, please visit <https://jobs.nmsu.edu/postings/41916>

2. Vanderbilt University School of Engineering, United States

Job Title: Faculty Positions in Computer Science

Description: The Department of Computer Science (CS) launched in 2020 a multi-year faculty recruitment and hiring process for 20 tenure-track positions at the Assistant, Associate, and Full Professor levels over and above normal hiring patterns, with preference at early-career appointments. In the first year of the initiative, the department welcomed eight new faculty members. In the second year, the initiative will support at least eight new faculty positions. Destination Vanderbilt-CS is part of the university's recently launched Destination Vanderbilt, a \$100 million university excellence initiative to recruit new faculty. Over the next three years, the university will leverage the investment to recruit approximately 60 faculty who are leaders and rising stars in their fields. All hires who are part of this initiative are over and above the normal faculty hiring rate at the university. We seek

Dec 5, 2021
<https://easychair.org/cfp/ROAD4NN2021>

DAC'21 – Design Automation Conference
San Francisco
Dec 5–9, 2021
<http://www.dac.com>

FPT'21 - Int'l Conference on Field-Programmable Technology
Auckland, New Zealand
Dec 6-10, 2021
<http://icfpt.org>

DAForum'21 - SIGDA/IEEE CEDA Ph.D. Forum at DAC 2021
San Francisco, CA
Dec 6, 2021
<https://easychair.org/cfp/daforum21>

HOST'21 – IEEE Int'l Symposium on Hardware-Oriented Security and Trust
Washington DC
Dec 12-15, 2021
<http://www.hostsymposium.org>

HiPC'21 – IEEE Int'l Conference on High Performance Computing, Data, And Analytics
Bangalore, India
Dec 17-20, 2021
<http://www.hipc.org>

iSES'21 – IEEE Int'l Symposium on Smart Electronic Systems
Jaipur, India
Dec 20-22, 2021
<http://www.ieee-ises.org>

ASP-DAC'22 - Asia and South Pacific Design Automation Conference
Virtual Conference

exceptional candidates in broadly defined areas of computer science that enhance our research strengths of the Vanderbilt University School of Engineering. Applications should be submitted on-line at: <http://apply.interfolio.com/94225> . For more information, please visit our website: <http://vu.edu/destination-cs> . Applications will be reviewed on a rolling basis beginning December 1, 2021 with interviews beginning January 1, 2022. For full consideration, application materials must be received by January 31, 2022.

3. Guangdong Technion Israel Institute of Technology, China

Job Title: Assistant/Associate/Full Professor in Mechanical Engineering and Robotics

Description: Faculty at the rank of Assistant, Associate and Full Professor at Guangdong Technion Israel Institute of Technology (GTIIT), Full Time, Mechanical Engineering Program and Centers for Robotics, Sustainable World, Science & Engineering in Health & Medicine. Shantou, Guangdong Province, China Submission Email: gtiitreruit@technion.ac.il.

Jan 17-20, 2022
<http://www.aspdac.com>

ISSCC'22 – IEEE Int'l Solid-State Circuits Conference
San Francisco, CA
Feb 20-24, 2022
<http://isscc.org>

FPGA'22 – ACM/SIGDA Int'l Symposium on Field-Programmable Gate Arrays
Monterey, CA
Feb 27 - Mar 1, 2022
<http://www.isfpga.org>

DATE'22 - Design Automation and Test in Europe
Antwerp, Belgium, and online
Mar 14-23, 2022
<http://www.date-conference.com>

ISQED'22 - Int'l Symposium on Quality Electronic Design
California
April 6-8, 2022
<http://www.isqed.org>

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