



## Special Interest Group on Design Automation ACM/SIGDA E-NEWSLETTER, Vol. 53, No. 3

### SIGDA - The Resource for EDA Professionals

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# SIGDA News

#### 1. [U.S. Opens Applications for CHIPS](#)

The US government has opened the first phase of its incentive programme to boost local semiconductor production with an interesting set of priorities.

#### 2. [U.S. Makes National Security Priority of CHIPS Subsidies](#)

The U.S. Department of Commerce (DOC) is focusing its rules for companies that aim to win the largest part of the \$52 billion in CHIPS Act subsidies on national security. Analysts told EE Times the U.S. expectations are set high.

#### 3. [Supercomputer Customers Shatter Intel GPU Roadmap](#)

Intel has had to abandon its latest GPU chip as supercomputer customers demand a drive to more integration of AI accelerators. The company had been due to launch its Rialto Bridge GPU later this year as the cost reduced, commercial successor to its high end, highly complex Ponte Vecchio chip.

#### 4. [Tesla Moves to Cut SiC Use in Electric Vehicles Shakes Market](#)

Tesla is developing a new powertrain for lower cost electric vehicles (EVs) that could use 75% less silicon carbide (SiC) power MOSFETs. The announcement sent shockwaves through the financial markets, prompting some companies to respond with more detailed analysis.

# Messages from the EiCs

Dear ACM/SIGDA members,

We are excited to present to you March 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

## 5. [Qualcomm Rolls Next Generation of Its Snapdragon Automotive 5G Platform](#)

At the MWC in Barcelona, Qualcomm introduced the latest addition to its Snapdragon Digital Chassis connected car technology portfolio with its Snapdragon Auto 5G Modem-RF Gen 2.

## 6. [China Dominates Semiconductor Patent Activity](#)

There have been 69,190 global patents for semiconductors filed in year to September 30, 2022, and 55 percent were filed by Chinese entities, according to Mathys & Squire, an intellectual property law firm.

# What is

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## What is a Deep Learning Watermark?

Dr. Yingjie Lao  
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Deep learning is rapidly gaining prominence as the driving force behind numerous state-of-the-art technologies. However, creating high-quality, large-scale deep learning systems can be costly, as it frequently necessitates vast amounts of data, powerful computing resources, and specialized knowledge. The expense and wide-ranging applications make deep learning intellectual properties extremely valuable assets, making them a target for piracy by adversaries. Unfortunately, it is relatively simple to pirate deep learning models as current cloning attacks can replicate a deep learning model with access to the model's input/output responses [1].

Watermarks can effectively combat piracy by embedding a unique signature into an intellectual property, which can identify illegal usage. Deep learning offers an intriguing approach to watermarking by incorporating backdoors into models as a signature [2]. Backdoors, which are traditionally viewed as a form of attack, introduce abnormal behavior

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into deep learning models that allows the attacker to control the model for their own malicious purposes using specific trigger inputs [3]. Deep learning developers can repurpose this technique by embedding identifying functionality into their models, such that when specific inputs are supplied during inference, it can be determined that the model belongs to the rightful owner [2]. This allows the owner to authenticate a pirated model as their own by demonstrating the abnormal behavior.

To be an effective identifier, deep learning watermarks must be able to reliably identify their owner while preserving the original functionality of the protected system. Various watermarking methods have arisen to improve upon various aspects of this objective. One of the most important metrics of reliability for a deep learning watermark is to be robust to various manipulations so that the watermark is preserved despite transformations introduced by the cloning method or attacks targeted at removing the watermark [4]. Other perspectives attempt to minimize the impact of the watermark on the model by modifying as few weights as possible [5]. Some watermark embedding frameworks even allow for specific copies of a model to be distinguished and identify if they've been modified [6].

In addition to protecting the models, similar watermarks are also being applied to other deep learning intellectual properties. As an example, recent works have extended the backdoor-based deep learning watermark to deep learning datasets [7]. In such settings, if an adversary trains a model using a stolen dataset with a secret watermark, the model will learn the signature embedded in the dataset that the owner can reveal. Similarly, deep learning hardware accelerators can also be watermarked by embedding subtle modifications into an architecture while maintaining the original functionality [8].

In summary, deep learning watermarks are signatures embedded in deep learning intellectual properties so they can be properly identified upon theft. These signatures must preserve the intellectual property's original functionality while being robust in real-world settings.

## References

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- [2] Zihang Zou, Boqing Gong, and Liqiang Wang. "Turning Your Weakness into a Strength: Watermarking Deep Neural Networks by Backdooring." In 27th USENIX Security Symposium, pp. 1615-1631. USENIX Association, 2018.

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**Xin Zhao,**

AE for Paper submission

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AE for Technical activities

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AE for Technical activities

# Paper Deadlines

## **ISLPED'23 – ACM/IEEE Int'l Symposium on Low Power Electronics and Design**

Vienna, Austria

Deadline: Mar 20, 2023

(Abstracts due: Mar 13, 2023)

Aug 7-8, 2023

<http://www.islped.org>

## **MDTS'23 – IEEE Microelectronics Design & Test Symposium**

Albany, NY

Deadline: Mar 17, 2023

Tentative Date: May 8-10, 2023

<http://natw.ieee.org>

## **ISVLSI'23 – IEEE Computer Society Annual Symposium on VLSI**

Iguana Falls, Brazil

Deadline: Mar 18, 2023

June 20 - 23, 2023

<http://www.ieee-isvlsi.org>

- [3] Khoa Doan, Yingjie Lao, Weijie Zhao, and Ping Li. "LIRA: Learnable, Imperceptible and Robust Backdoor Attacks." In IEEE/CVF International Conference on Computer Vision, pp. 11946-11956. IEEE, 2021.
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- [5] Yingjie Lao, Peng Yang, Weijie Zhao, and Ping Li. "Identification for Deep Neural Network: Simply Adjusting Few Weights!." In 38th IEEE International Conference on Data Engineering, pp. 1328-1341. IEEE, 2022.
- [6] Yingjie Lao, Weijie Zhao, Peng Yang, and Ping Li. "DeepAuth: A DNN Authentication Framework by Model-Unique and Fragile Signature Embedding." In Thirty-Sixth AAAI Conference on Artificial Intelligence, pp. 9595-9603. AAAI Press, 2022.
- [7] Yossi Adi, Carsten Baum, Moustapha Cisse, Benny Pinkas, and Joseph Keshet. "Anti-Neuron Watermarking: Protecting Personal Data Against Unauthorized Neural Networks." In 17th European Conference on Computer Vision, pp. 449-465. Springer, 2022.
- [8] Joseph Clements and Yingjie Lao. "DeepHardMark: Towards Watermarking Neural Network Hardware." In Thirty-Sixth AAAI Conference on Artificial Intelligence, pp. 4450-4458. AAAI Press, 2022.

# Technical Activities

## **1. [Cybersecurity Label for U.S. Coming as Early as April](#)**

The 600-plus companies that have joined the ioXt Alliance to help it build confidence in Internet of Things products will be among the first to experience the national cybersecurity label NIST is developing for consumer Internet of Things (IoT) products and consumer software products—as soon as April...

## **2. [UMC and Cadence Partner on 3D-IC Hybrid Bonding Reference Flow](#)**

UMC's hybrid bonding solutions are now ready to support the integration across a broad range of technology nodes suitable for edge AI, image processing, and wireless communications...

## **3. [Renesas Automotive IPD Enables 40% Smaller Footprint](#)**

The new device comes in the small TO-252-7 package, reducing the mounting area by 40% compared to conventional TO-263 packaged products...

## **ESWEEK'23 - Embedded Systems Week**

Hamburg, Germany  
 Deadline: Mar 23, 2023  
 (Abstracts due: Mar 16, 2023)  
 Sept. 17-22, 2023  
<http://www.esweek.org>

## **PACT'23 - Int'l Conference on Parallel Architectures and Compilation Techniques**

Vienna, Austria  
 Deadline: Apr 1, 2023  
 (Abstracts due: Mar 25, 2023)  
 Oct 21-25, 2023  
<http://www.pactconf.org>

## **IWLS'23 - International Workshop on Logic & Synthesis**

EPFL, Lausanne, Switzerland  
 Deadline: Apr 10, 2023  
 (Abstracts due: Apr 3, 2023)  
 June 5-6, 2023  
<https://www.iwls.org>

## **BioCAS'23 – Biomedical Circuits and Systems Conference**

Toronto, Canada  
 Deadline: June 9, 2023  
 Oct 19-21, 2023  
<https://2023.ieee-biocas.org/>

## **NOCS'23 – IEEE/ACM Int'l Symposium on Networks-on-Chip (co-located with ESWEEK 2023)**

Hamburg, Germany  
 Deadline: Apr 21, 2023  
 (Abstracts due: Apr 14, 2023)  
 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  
 Deadline: May 5, 2023  
 (Abstracts due: Apr 28, 2023)  
 Sept 21-22, 2023  
<https://memocode2023.github.io>

#### 4. [Top 5 Challenges for Cloud Computing in 2023](#)

Challenges must be addressed if cloud computing is to be a viable option for a broader swath of businesses...

# Job Positions

## 1. Kyushu University, Japan

**Job Title:** Professors/Associate Professors of Information Science and Electrical Engineering

Description: The successful candidate is expected to conduct research in the Department of Electronics for the following topics: integrated circuit design, semiconductor device design, semiconductor process, packaging, semiconductor material development, semiconductor applications such as IoT, international standardization activities, marketing or product management, etc. in semiconductor-related fields. He/she will join the Education Center for Value Creation in Semiconductors (tentative name) to be established shortly, where he/she will give education to students in the Department of Electrical Engineering and Computer Science, School of Engineering, Graduate School of Information Science and Electrical Engineering, and related schools and graduate schools in Kyushu University. For more information, please refer to <https://polytechnicpositions.com/professorsassociate-professors-of-information-science-and-electrical-engineering,i11259.html>.

## 2. University of New Brunswick Department of Electrical and Computer Engineering, Canada

**Job Title:** Assistant Professor in Electrical and Computer Engineering

Description: The Faculty of Engineering at the University of New Brunswick in Fredericton invites applications for a two-year term position at the rank of Assistant Teaching Professor in the Department of Electrical and Computer Engineering (ECE) commencing May 1, 2023, subject to budgetary approval. To be considered for the position, the applicant should have demonstrated teaching abilities and relevant practical experience in Electrical Engineering. The successful applicant will bring a strong commitment to teaching excellence in several core undergraduate courses offered for our Electrical Engineering program including electricity and magnetism, circuits, electronics, digital and embedded systems, and

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

San Francisco, CA  
Deadline: May 22, 2023  
(Abstracts due: May 15, 2023)  
Oct 29 - Nov 2, 2023  
<http://www.iccad.com>

### VLSI-SoC'23 – IFIP/IEEE Int'l Conference on Very Large Scale Integration

Dubai, UAE  
Deadline: May 23, 2023  
(Abstracts due: May 16, 2023)  
Oct 16-18, 2023  
<http://www.vlsi-soc.com>

### HiPC'23 – IEEE Int'l Conference on High Performance Computing, Data, And Analytics

Goa, India  
Deadline: July 7, 2023  
(Abstracts due: June 30, 2023)  
Dec 18-21, 2023  
<http://www.hipc.org>

# Upcoming Conferences

### DATE'23 - Design Automation and Test in Europe

Antwerp, Belgium  
Mar 17-19, 2023  
<http://www.date-conference.com>

### ISPD'23 – ACM Int'l Symposium on Physical Design

Virtual Conference  
Mar 26 - 29, 2023  
<http://www.ispd.cc>

### ISQED'23 - Int'l Symposium on Quality Electronic Design

San Francisco, CA

electrical design. The department wishes to hire a teaching professor with a broad background in Electrical Engineering to maximize teaching synergies. It is also expected that the successful applicant will contribute meaningfully to departmental service responsibilities. Applicants should possess both undergraduate and graduate degrees in Electrical Engineering. Review of applications will begin March 1, 2023, and will continue until the position is filled. For more information, please refer to <https://facultyvacancies.com/assistant-professor-in-electrical-and-computer-engineering.i32835.html>.

### 3. University of Sharjah, United Arab Emirates

**Job Title:** Postdoctoral Fellow in Autonomous Robotics and Active Vision

Description: The Research Institute of Sciences and Engineering (RISE) is seeking to hire a Postdoctoral Research Fellow in the area of Autonomous robots to work on control systems and path planning for the autonomous robotics and active vision Lab. The focus of the position is research and development in the areas of Robotics, Mechatronics, and Computer Vision. The candidate selected for this position will be expected to conduct scientific research in the following areas: 1. Modern and intelligent control for robotic systems. 2. Path planning for robotic systems. 3. Coordination between different types of robots, such as: UGVs and UAVs. 4. Active computer vision integration. The applicant will work in a dynamic research environment with the opportunity to collaborate across multiple projects and research faculty within this research theme. For more information, please refer to <https://newhr.sharjah.ac.ae/en/Pages/JobDetails.aspx?Jid=2076&IsDean=No>.

April 5-7, 2023  
<http://www.isqed.org>

#### **HOST'23 – IEEE Int'l Symposium on Hardware-Oriented Security and Trust**

San Jose, CA  
May 1-4, 2023  
<http://www.hostsymposium.org>

#### **FCCM' 23 - IEEE International Symposium On Field-Programmable Custom Computing Machines**

Los Angeles, CA  
May 8 - 11, 2023  
<https://www.fccm.org/>

#### **ISCAS'23 – IEEE Int'l Symposium on Circuits and Systems**

Monterey, CA  
May 21 - 25, 2023  
<http://iscas2023.org>

#### **RTAS'23 - IEEE Real-Time and Embedded Technology and Applications Symposium**

San Antonio, Texas  
May 9-12, 2023  
<http://2023.rtas.org>

#### **GLSVLSI'23 – ACM Great Lakes Symposium on VLSI**

Knoxville, TN  
June 5-7, 2023  
<http://www.glsvlsi.org>

#### **DAC'23 – Design Automation Conference**

San Francisco, CA  
July 9-13, 2023  
<http://www.dac.com/>

#### **ICDCS'23 – IEEE Int'l Conference on Distributed Computing Systems**

Hong Kong, China  
Jul 18 - 21, 2023  
<https://www.icdcs.org/>

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