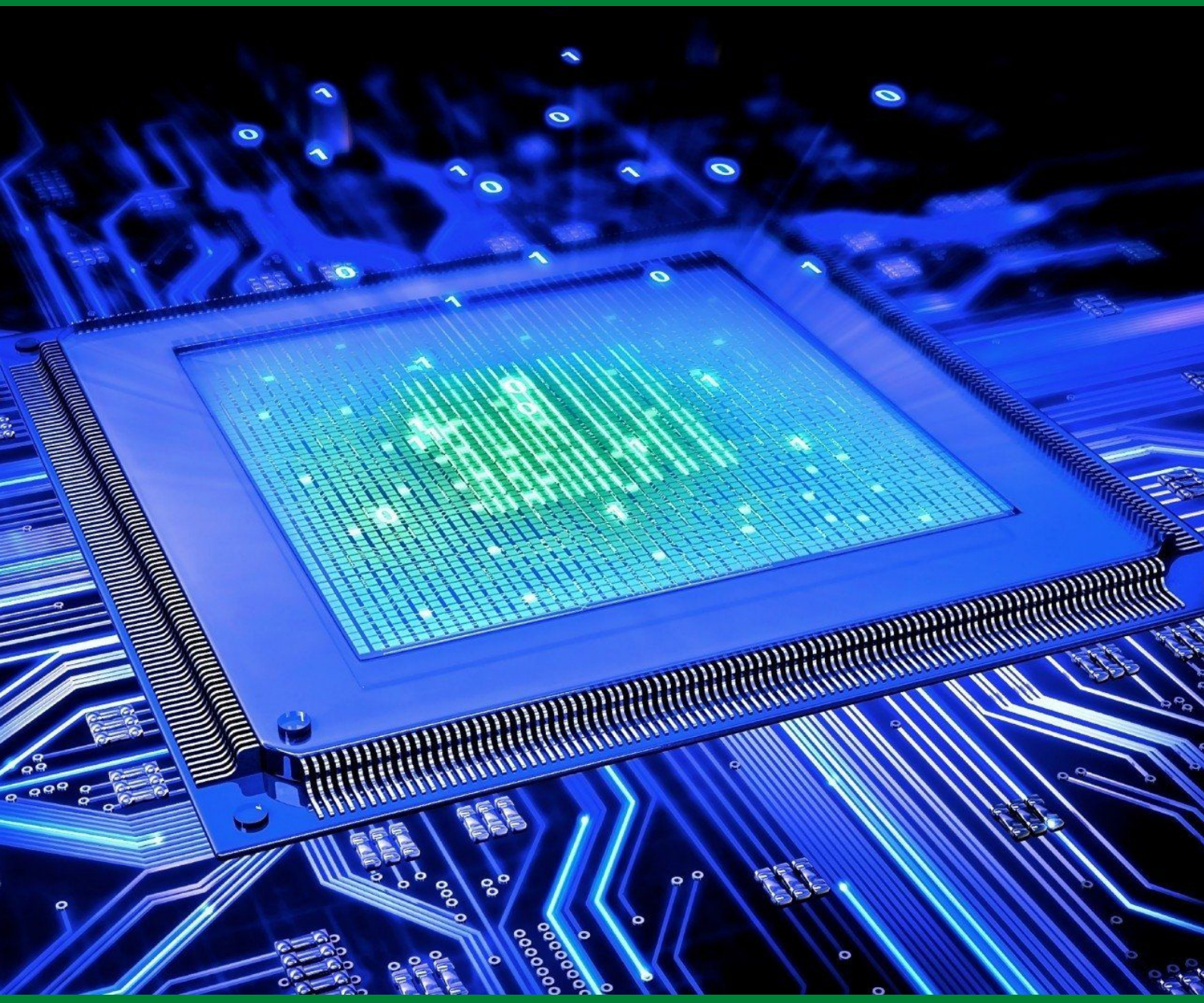
ICERYX

Department of Instrumentation and Control Engineering

SARANATHAN COLLEGE OF ENGINEERING



EDITORIAL
MAY-AUG 2020

FOREWARD

The students of department of Instrumentation and Control Engineering are nurtured with the resources for upliftment in terms of technical activity. The students are encouraged for taking forward the technical resources and mould themselves for technical outcome. The hard work, team work and spirit in students bring the developed nation. The magazine ICERYX is an attempt to mould the students in this aspect.

FROM THE EDITORS DESK

Dear readers,

It's our pleasure to provide you with interesting articles. From this edition, the magazine of ICERYX is getting its new form. Hope you would like to read it this way. Many new measures have been taken to bring in more fervent readers for our magazine. From the Public Relations team, we express gratitude to everyone who supported us in this endeavor. Stay tuned on to update yourself with the deeds of our department as well as the outside world. Happy reading!

PR TEAM MEMBERS

1st YEARS

REGENA ARSHINI
MOHAMED YAHYA
BHARATH SAMUEL
SHARLENE

2nd YEARS

HARIHARAN.T
VASUNDRA.R
SHIVA SHANKAR.A
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SURYA PRAKASH.D
PRANAV KUMAR.S

3rd YEARS

MAHALAKSHMI.S.P
SHARVIN SHAKESH.P
AKASH SAMI. R
SURYA.S

4th YEARS

R.MILAN PATEL,
B.IRFHANNA AMEER,

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ART AND PHOTOGRAPHY

Core AVI releases Safe AI and Computer Vision Software stack

CoreAVI have released their Safe AI and Computer Vision Solution which includes the company's newest product, the VkCoreVX SC, a safety critical implementation of Khronos' OpenVX1.3 API.

This Safe AI and Computer Vision Solution provides a flexible framework for computer vision, signal processing, and neural network inferencing while achieving stringent levels of safety certification. Application developers will now be able to deploy object detection and tracking algorithms based on a safety certifiable framework.

VkCoreVX SC provides a feature set for implementing and deploying convolutional neural networks, supporting vector machines, gaussian filtering and optical flow. It is built on top of CoreAVI's safety critical Vulkan SC implementation (VkCore SC), which provides both graphics and compute capabilities within the same safety critical framework.

As a result, visualizing compute workloads, which is needed in augmented vision systems, autonomous systems, or degraded visual environments, can now for the first time be done from within a safety critical API with a deterministic runtime-state-management.

In addition to the VkCore SC graphics and compute driver, the complete Safe AI and Computer Vision Solution also includes CoreAVI's ComputeCore compute libraries to enable safety critical implementation of BLAS (Basic Linear Algebra Subprograms) and FFTs (Fast Fourier Transform).

The software stack facilitates the transition to safety certifiable Vulkan compute from commercial OpenCL, CUDA, and OpenCV solutions and has been designed from the ground up for real time and safety certification and contains no open source components and no 3rd party software. The Safe AI and Computer Vision Solution is available with CertCore 26262 including ISO 26262 Accredited Safety Assessment Certificate ASIL D and CertCore 178 (DO-178C / ED-12C Avionics) DAL A safety certification package.

"CoreAVI is excited to announce our first safety critical Safe AI and Computer Vision Solution that offers OpenVX 1.3 capabilities," said Damian Fozard, CEO at CoreAVI. "The future of many industries, including aerospace and defense, automotive, and industrial IoT depend on the availability of advanced algorithms to enable neural networks. We are happy to provide our customers with a true safety critical software stack to facilitate powerful AI and computer vision capabilities on their modern GPUs."

Smarter, if not smart cities

A number of smart city projects, such as smart traffic and smart lighting, have been underway for some time in cities across the globe.

Technologies like 5G and artificial intelligence (AI) are helping to drive many of these projects but, both governments and technology providers still need to overcome numerous technological obstacles as well as develop business models that will be able to deliver a clearer return on investment. So, is a fully interconnected smart city any closer to being realized ?

Greg Corlis, managing director for emerging technologies at KPMG, said, “Not really. Cities are still struggling with the economics to really achieve smart city status. What we are seeing today is that most cities are still experimenting with these technologies for discrete use cases. Smart lighting is a relatively easy and safe use case for them to dip their toes in the water.”

According to Corlis, the more projects that are carried out and the more findings are shared, so the faster the technology can be rolled out.

Bratislava, the capitol of Slovakia, is working with Sensoneo on a large-scale smart waste programme, for example, The project aims to optimize the routes of waste collection trucks reducing their mileage and emissions and saving money on fuel costs.

Commenting City spokesperson Katarína Rajčanová said, “For the citizens of Bratislava, this would mean cleaner public spaces and more efficient waste collection services.”

The project requires the installation of 1753 Sensoneo sensors to monitor all containers of glass waste and underground bins across the city which will monitor their fill levels to make sure they are not being emptied unnecessarily. Sensoneo’s WatchDog device, which combines an RFID reader, GNSS satellite location tracking and a communications module, will be deployed on all waste collection vehicles to digitalise the waste collection process, automatically verify pick-ups and optimize routes.

Deployed on waste collection vehicles Sensoneo's WatchDog device combines an RFID reader, GNSS satellite location tracking and a communications module

A research project in Melbourne, Australia allowed its citizens to engage with smart city technology which is hoped will help with future city planning.

Professor Sarah Pink, chief investigator and director of the Emerging Technologies Research Lab at Monash University, said,: "This project will contribute important insights into how people perceive, value, and use emerging technologies in the urban environment."

Locals were able to interact with the technology during Melbourne Knowledge Week (held at the end April) by scanning QR codes that explained the role of each, be they 5G-, AI- or Internet of Things (IoT)-based. The results of the project have yet to be shared but, by providing their feedback, those that took part in the live experiment will play a vital role in shaping their city.

"This partnership employs a transparent approach to data collection, which is also why it was so important for us to include the local community and invite them to take part in our live experiment," added Prof Pink.

Town centre usage

In 2018 the' Connected London' team was formed to deliver on the mayoral manifesto. Since then, London's full fibre coverage – where a cable runs from a building to a telephone exchange – is said to have risen from 4.7% to 21.1%.

An update from Connected London in October 2020 revealed how individual boroughs are working on their own digital district and fiber strategies.

Westminster City Council, for instance, has secured £1.1m funding to run its Digital Street Markets project, which will see the deployment of secure and reliable wi-fi networks at all council-run street markets.

Richmond Council is working with transport AI company Vivacity Labs to understand if and how local residents have changed their habits of moving around the borough since the beginning of the COVID-19 pandemic.

Sensors will be used to anonymously monitor footfall and usage in certain areas, such as cycle lanes and the town center. These insights will inform better planning to improve the road network and urban environment, with the aim of improving safety as well as making the borough smarter and more sustainable.

"Early in the pandemic we made urgent temporary changes to road and pavement space in order to accommodate for active travel and help people to keep their distance," explained Cllr Alexander Ehmann, chair of the Transport and Air Quality Committee. "As we move into the recovery period, we anticipate that people's transport habits and the way they use public space will continue to adapt. These sensors will give us a granular picture of how traffic levels, transport and pedestrian movements change through the course of a day, week or month."

The digital IoT connected sensors that are being installed as part of the project are designed to provide accurate data on road and pavement usage. They cannot be used to collect personal data or for enforcement purposes.

The pandemic has revealed that much of the infrastructure for smart city implementation already exists. Similar to the Richmond Council example, Chicago city has used anonymized data to analyse travel patterns through the city as well as tracking people who were self-isolating. Various governments throughout the world also used smartphone data to track individuals infected with the virus and trace anyone else they came in contact with.

Smart traffic solutions

Envision in Rome are using IMX500 image sensors from Sony Europe to create a smart parking system

Three smart city trials being run in June by Envision in Rome are using IMX500 image sensors with AI processing functionality from Sony Europe. The trial's primary objective is to create a smart parking system to reduce pollution and gridlock caused by people trying to find a free space. Drivers are alerted via a smartphone app and directed to the closest empty parking space.

The project also includes a study to optimize capacity and increase the use of its public transport network. Smart bus shelters will count those getting on and off each bus to prevent overloading and allow a better number of buses and costs savings.

Finally, a smart lighting system will be activated at pedestrian crossings that uses low-latency lighting to make people using the crossings more visible to drivers to reduce the risk of accidents. Again, no images from this project are stored, nor leave the sensors used.

UK-based smart street lighting provider, Telensa, is involved in two projects. The first is in partnership with the University of Leicester where its PLANet smart lighting Central Management System (CMS) is being used to enable the management and control of its external lighting remotely from a secure online portal. According to Telensa, this makes Leicester the first university in the UK to adopt this kind of system.

Western Australia has also selected Telensa to provide the city of Stirling with a 'Network-as-a-Service' (NaaS) solution including wireless streetlight controls and a PLANet CMS.

All the lighting in the city's Princess Wallington Reserve public park has been converted to LEDs and PLANET will enable lighting levels throughout the park to be varied when needed to save energy and reduce emissions.

Previously, smart lighting has only been viable for large-scale smart lighting networks. Telensa's NaaS model has been developed to bring smart street lighting benefits to customers with smaller networks. The company claims that this model will generate immediate savings without the need for substantial investment in network infrastructure.

In contrast to Corlis' answer that we're no closer to fully interconnected smart cities being realized, others are more positive.

Steven Bornfield, senior consultant for data center solutions provider, Chatsworth Products, said, "I think our biggest challenge in this field is about the size and volume of data transfers, and exactly how we're going to handle that. There is a challenge, as well, to get power to all those different points, and to get it there reliably."

However, Bob Flaherty, senior vice president of product management, Cimcon, added, "The short answer is we are closer. The longer answer is that the smart city market is moving along the traditional technology adoption curve, the same as many other strategically important solutions and paradigms, in order to find a 'sweet spot' in terms of achieving the promise."

APTITUDE- CODING AND DE-CODING

1. If in a certain language, MADRAS is coded as NBESBT, how is BOMBAY coded in that code?
(a) CPNCBX (b) CPNCBZ
(c) CPOCBZ (d) CQOCBZ

2. In a certain code, COMPUTER is written as RFUVQNPC. How is MEDICINE written in the same code?
(a) EOJDJEFM (b) EOJDEJFM
(c) MFEJDJOE (d) NQPTJOHJ

3. If in a certain code, TEACHER is written as VGCEJGT, how is FAMINE coded in that code?
(a) HCOKQG (b) HCOKPG
(c) HCNKPG (d) HCOLPG

4. If MADRAS can be written as ARSARS, how can ARKONAM be written in that code?
(a) ROAAKNM (b) ROAKANAM
(c) ROAKNNM (d) ROAKNAM
(e) ROKANAM

5. In a code language, DISTANCE is written as IDTUBECN and DOCUMENT is written as ODDVNTNE. How is THURSDAY written in that language?
(a) DTVSTEYA (b) HTTQRYAD
(c) HTVSTYDA (d) HTVSUADS
(e) HTVSTYAD

6. In a certain code, PAPER is written as SCTGW. How is MOTHER written in that code?
(a) ORVLGW (b) PQVJGT
(c) PQXJJT (d) PQXKJV
(e) None of these

7. In a certain code, GIGANTIC is written as GIGTANCI. How is MIRACLES written in that code?
(a) MIRLCAES (b) MIRLACSE
(c) RIMCALSE (d) RIMLCAES

8. If DIAMOND is coded as VQYMKLV, how is FEMALE coded?
(a) TUMYNU (b) UVNZOV
(c) UVNYNV (d) TVNYNV (e) TUMZOU

9. In a certain code 'have to go now' is written as 'to 1 now 2 have 3 go four and 'appearing for bank exam' is written as 'for 1 exam 2 bank 3 appearing 4. How will 'entry from this gate' be written in the same code?
(a) This 4 gate 3 from 2 this 1
(b) This 1 gate 2 from 3 entry 4
(c) This 1 gate 2 entry 3 from 4
(d) Entry 1 from 2 gate 3 this 4
(e) Entry 4 from 3 gate 2 this 1

10. If ROSE is coded as 6821, CHAIR is coded as 73456 and PREACH is coded as 961473, what will be the code for SEARCH?
(a) 246173 (b) 214673 (c) 214763
(d) 216473 (e) None of these

11. If GO = 32, SHE = 49, then SOME will be equal to,
(a) 24 (b) 27
(c) 56 (d) 58

12. Certain words are coded as follows: BEAR-9281, DRUM-0683, PRY-485 AND DOOR-7899.What is the code for 'R'?
(a) 9 (c) 8
(b) 3 (d) 4

13. If 'orange' is called 'ashen', 'ashen' is called' red', 'red' is called 'blue', 'blue' is called 'brown', 'brown' is called 'black', 'black' is called 'white' and 'white'is called 'pale', what is the color of a tree trunk?
(a) Black (c) blue
(b) Brown (d) white (e) red

14. If 'light' is called 'color', 'color' is called 'red', 'power'is called 'light', 'red'is called 'dust' and 'dust' is called 'waste', what do we get from sun?
(a) color (c) red
(b) light (d) power (e) dust

15. In a certain code language:
'pitnasom' means 'bring me water'
'najotod' means 'water is life'
'tub od pit' means 'give me toy'
'jolinkot' means 'life and death'

Which of the following represent 'is' in the language?
(a) jo (d) tod
(b) na (e) none of these
(c) lin

VERBAL APTITUDE

ERROR CORRECTION

1. It is a truth that (a)/ those who are jealous of others (b)/ never get peace in life. (c)/ No error (d)
2. Walking along (a)/ the bank of the river (b)/ the road begins to rise (c)/ No error (d).
3. Shyam is telling (a)/ that I have (b)/ stolen his pen(c)/ No error (d).
4. The driver showed (a)/ great talent in keeping (b)/ the damaged car under control.(c)/ No error (d)
5. If it were possible to get near when (a)/ one of the volcanic eruptions take place (b)/ we should see a grand sight. (c)/ No error (d)
6. Tea grows (a)/ both in Assam (b)/ and Ceylon. (c)/ No error (d)
7. He described about (a)/ the unpleasant experiences (b)/ he had in the jail. (c)/ No error (d)
8. I shall avail (a)/ of this opportunity (b)/ to meet you there. (c)/ No error (d)
9. If I got rich (a)/ I would travel (b)/ around the world. (c)/ No error (d)
10. Engines used in space shuttles (a)/ are very much larger (b)/ and more strong than the ones used in Jet planes. (c)/ No error (d)
11. Remember that a (a)/ stitch at a time (b)/ saves nine. (c)/ No error (d)
12. The timid creature was driven (a)/ into a narrow lane (b)/ where it was slowed by the kidnapper. (c)/ No error (d)
13. I was having a holiday (a)/ by seaside last summer (b)/ when I ran into Captain Robinson. (c)/ No error (d)
14. The G.M. (a)/ of the company (b)/ dispensed the Manager's services. (c)/ No error (d)
15. The river is in spate (a)/ and it has overflow (b)/ its banks. (c)/ No error (d)
16. He was debarred (a)/ to appear (b)/ at the examination. (c)/ No error (d)
17. A rise in rents and wages (a)/ to appear (b)/ at the examination. (c)/ No error (d)
18. It is not (a)/ I who is (b)/ to blame. (c)/ No error (d)
19. Of the two great cities (a)/ the former is (b)/ biggest.(c)/ No error (d)
20. When I entered the bedroom (a)/ I saw a snake crawling (b)/ on the ground. (c)/ No error (d)

ONE WORD SUBSTITUTION

1. An involuntary action under a stimulus is described as a
   a. complex b. reflex
   c. reflection d. response
2. A continuous process of change is known as
   a. transformation b. metamorphosis
   c. flux d. dynamism
3. The use of many words where only a few are necessary
   a. circumlocution b. circumspection
   c. circumscription d. circumvention
4. Circular building or hall with a dome
   a. edifice b. palace
   c. rotunda d. spire
5. One who is a citizen not of a country but of the world
   a. Bohemian b. Cosmopolitan
   c. Philanthropist d. Internationalist

DID YOU KNOW

1. Before the 17th century, science and scientists were not truly recognized. At first, people like the 17th century genius Isaac Newton were called natural philosophers, because there was no concept of the word "scientist" at the time.
2. The only letter that doesn't appear on the periodic table is J.
3. An ice cube takes up about 9 percent more volume than the water used to make it.
4. A lightning strike can reach a temperature of 30,000 C or 54,000 F. About 400 people are hit by lightning each year. On Mars, iron oxide forms a rust dust that floats in the atmosphere and creates a coating across much of the landscape.
5. Every human being has 99 percent of their DNA in common. A parent and child share 99.5 percent of the same DNA, and you have 98 percent of your DNA in common with a chimpanzee.
6. The Queen Alexandra's Birdwing is the world's largest butterfly, with a wingspan of up to 12 inches. It is found only in Papua New Guinea and is considered endangered.
7. Six elements account for 99 percent of the mass of the human body: oxygen, carbon, hydrogen, nitrogen, calcium, and phosphorus. The human body contains enough carbon for 9,000 pencils.
8. While the planet Mercury may resemble our own moon in many ways, it has no moon of its own.
9. It is possible to die from drinking too much water. Water intoxication and hyponatremia result when a dehydrated person drinks too much water without the accompanying electrolytes.
10. A teaspoonful of neutron star would weigh 6 billion tons

ART AND PHOTOGRAPHY

1

Photography

1. Pranav kumar .s , 2nd year, ICE

Digital Art

2. R.G. Hariharan - 4th year ,ICE

3.R.G. Hariharan - 4th year ,ICE

2

3