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EVENT REPORT 2017-18

S.N	Title of Activity	Organizer / Resource person	Date	No. of Beneficiaries /Participants
1	Workshop on "Introduction to Calculators"	IEEE Coordinators	8/9/2017	203
2	Social Activity on "Basics of Computers"	IEEE Coordinators	15/9/2017	150
3	Workshop of "DS7 Solidworks"	Kaustubh Pathak and Swapnil Mistry BE Third Mech Engg	21/9/2017	20
4	Training Program on " Effectively and efficiently utilizing the IEEE Xplore platform for project and research"	Mr. Chandrakant Ganvir, IEEE Certified Trainer, EBSCO Information Service, New Delhi	6/1/2018	20
5	The Ultimate Talk (Public Speaking Competition)	IEEE Coordinators	17/01/201819/01/2018 24/01/2018	11
6	IEEE Paper Presentation	IEEE Coordinators	16/02/2018	4
7	Two Day Workshop on "Hands on VLSI Circuit Design using Cadence"	Prof. S. P. Badar E & TC Dept SSGMCE	17/03/2018 To 18/03/2018	21

EVENT REPORT 2017-18

8	Two Day Workshop on "Hands on VLSI Circuit Design using Cadence"	Prof. S. P. Badar E & TC Dept SSGMCE	31/03/2018 To 01/04/2018	21
9	YP Guest Lecture on 'Cognitive Radio"	Mr. Suyog Vyavahare, YP IEEE Bombay Section	7/04/2018	20
10	Summer School on Internet of Things	Dr. K. B. Khanchandani Prof. P. R. Wankhede	11/06/2018 To 07/07/2018	27
11	Summer School on CMOS VLSI Circuit Design	Dr. K. B. Khanchandani Prof. S. P. Badar	11/06/2018 To 07/07/2018	19

Prof. P. R. Wankhede
Branch Counselor

Executives on How to Succeed in Engineering

At the IEEE Women in Engineering conference, executives shared tips on how to set goals and overcome imposter syndrome

THE INSTITUTE

The aim of this year's IEEE Women in Engineering International Leadership Conference (IEEE WIE ILC) was to increase the number of women in middle- to senior-level positions. I attended several sessions that offered career advice to attendees about how they could rise up the ranks. The event was held on 23 and 24 May in Austin, Texas.

"This conference is all about following your passions and making sure women thrive in technology," said IEEE WIE ILC chair and Senior Member Kathy Herring Hayashi in her opening remarks.

Eighty-five percent of women in electrical engineering quit in the first 15 years of their careers because they feel unsupported or undermined at work, according to Herring Hayashi. She recalled that at one time in her life, she too thought about leaving engineering because she felt isolated. Today, she's an engineer at Qualcomm in San Diego.

The first keynote speaker was Leslie Robertson, vice president of Oracle Cloud Infrastructure. She shared 10 lessons she'd learned during her rise to the top, including seeking feedback, asking questions, and not letting fear hold you back.

In a panel about empowering women, three representatives—so-called ambassadors—of the Clean Energy Education and Empowerment Initiative recounted their experiences with mentoring other women. This initiative, a collaboration among the U.S. Department of Energy, Texas A&M University's Energy Institute, MIT's Energy Initiative, and Stanford Récourt Institute for Energy, works to close the gender gap in the clean energy industry by increasing participation by women and encouraging their promotion to leadership positions.

"More women are graduating with degrees in engineering, but the percentage of women in top executive positions hasn't changed since the 1980s," said Catherine Jerez, C3E ambassador and moderator of the panel. The initiative sends its ambassadors to conferences to talk about their personal experiences with moving up to high-level position

New Optimization Chip Tackles Machine Learning, 5G

A 49-core chip by Georgia Tech uses a 1980s-era algorithm to solve some of today's toughest optimization problems faster than a GPU

Engineers at Georgia Tech say they've come up with a programmable prototype chip that efficiently solves a huge class of optimization problems, including those needed for neural network training, 5G network routing, and MRI image reconstruction. The chip's architecture embodies a particular algorithm that breaks up one huge problem into many small problems, works on the subproblems, and shares the results. It does this over and over until it comes up with the best answer. Compared to a GPU running the algorithm, the prototype chip—called OPTIMO—is 4.77 times as power efficient and 4.18 times as fast.

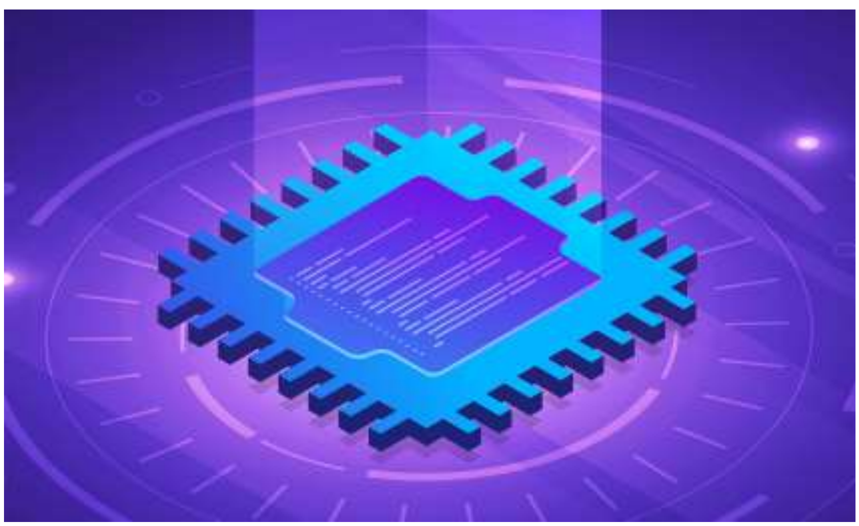
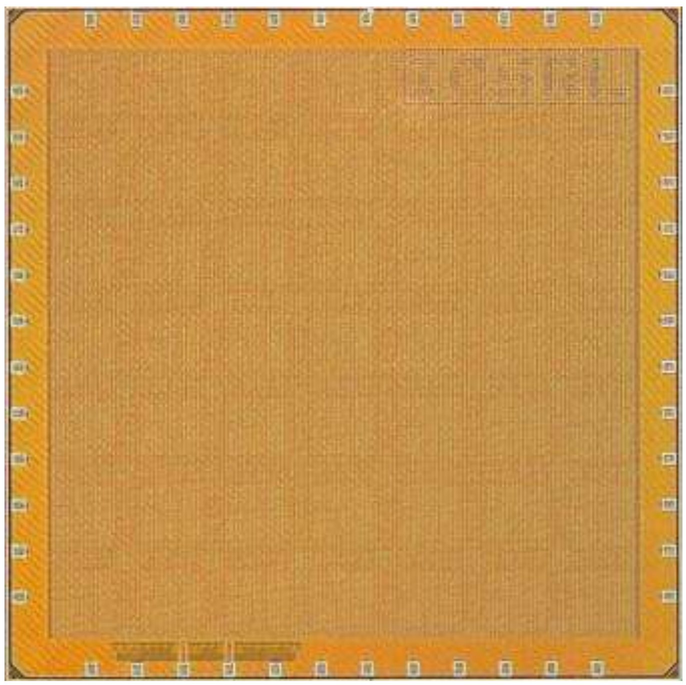


Image: Georgia TechOPTIMO's 7 x 7 array of cores are interlinked to facilitate the gather and scatter steps of an optimization algorithm called ADMM.

The training of machine learning systems and a wide variety of other data-intensive work can be cast as a set of mathematical problem called constrained optimization. In it, you're trying to minimize the value of a function under some constraints, explains Georgia Tech professor Arijit Ray Chowdhury. For example, training a neural net could involve seeking the lowest error rate under the constraint of the size of the neural network.



“If you can accelerate [constrained optimization] using smart architecture and energy-efficient design, you will be able to accelerate a large class of signal processing and machine learning problems,” says Ray Chowdhury. A 1980s-era algorithm called alternating direction method of multipliers, or ADMM, turned out to be the solution. The algorithm solves enormous optimization problems by breaking them up and then reaching a solution over several iterations.

“If you want to solve a large problem with a lot of data—say one million data points with one million variables—ADMM allows you to break it up into smaller subproblems,” he says. “You can cut it down into 1,000 variables with 1,000 data points.” Each subproblem is solved and the results incorporated in a “consensus” step with the other subproblems to reach an interim solution. With that interim solution now incorporated in the subproblems, the process is repeated over and over until the algorithm arrives at the optimal solution.

In a typical CPU or GPU, ADMM is limited because it requires the movement of a lot of data. So instead the Georgia Tech group developed a system with a “near-memory” architecture.

“The ADMM framework as a method of solving optimization problems maps nicely to a many-core architecture where you have memory and logic in close proximity with some communications channels in between these cores,” says Raychowdhury.

The test chip was made up of a grid of 49 “optimization processing units,” cores designed to perform ADMM and containing their own high-bandwidth memory. The units were connected to each other in a way that speeds ADMM. Portions of data are distributed to each unit, and they set about solving their individual subproblems. Their results are then gathered, and the data is adjusted and resent to the optimization units to perform the next iteration. The network that connects the 49 units is specifically designed to speed this gather and scatter process.

ELECTRONIC LICENSE PLATES FOR DRONES MAY COME SOON

Drones may soon carry electronic license plates, thanks to new guidelines for a remote ID system for unmanned aircraft recently submitted for approval.

The newly proposed standard, ASTM WK65041, sets up guidelines for how drones can identify themselves to remote observers, as well as for how to set up systems to read that data. Developed with input from civil aviation authorities such as the U.S. Federal Aviation Administration (FAA) and Transport Canada, as well as leaders in the drone industry, the would be standard was submitted to global standards organization ASTM International (originally the American Society for Testing and Materials) on 5 September and will be out for ballot on 9 September.

"We're working with a lot of drone manufacturers on this standard—DJI, for instance," says Philip Kenul, chairman of ASTM International's Committee F38 on Unmanned Aircraft Systems, which helped develop the newly proposed standard. "Many other companies are working with us as well, such as Google Wing and Amazon, and will comply with the standard."

Apps on smartphones or other devices can then connect to the Internet to look up data on the drone. The public will likely only be able to read the drone's ID number, which might be the drone's serial number, or a registration number from the FAA or other civil aviation authorities. Law enforcement can get more information about the drone from its ID data, such as its latitude, longitude, altitude, speed, direction, and take-off point, plus its owner and operator data, and the stated purpose of the flight.

The standard's developers envision drones continuously broadcasting ID data via WiFi or Bluetooth as part of the messages such technologies normally transmit to allow other devices to discover and link with the broadcasting device. These ID signals are readable from a distance of 350 to 450 meters.

"Intel has done studies showing that when Bluetooth 5 comes out, we could expect a range of up to a kilometer," Kennel says.

UNMANED AERIAL VEHICLE

Abstract:

Wireless communication systems that include unmanned aerial vehicles promise to provide cost-effective wireless connectivity for devices without infrastructure coverage. Compared to terrestrial communications or those based on high-altitude platforms, on-demand wireless systems with low-altitude UAVs are in general faster to deploy, more flexibly reconfigured, and likely to have better communication channels due to the presence of short-range line-of-sight links. However, the utilization of highly mobile and energy-constrained UAVs for wireless communications also introduces many new challenges. In this article, we provide an overview of UAV-aided wireless communications, by introducing the basic networking architecture and main channel characteristics, highlighting the key design considerations as well as the new opportunities to be exploited.

Introduction:

With their high mobility and low cost, unmanned aerial vehicles (UAVs), also commonly known as drones or remotely piloted aircrafts, have found a wide range of applications during the past few decades [1]. Historically, UAVs have been primarily used in the military, mainly deployed in hostile territory to reduce pilot losses. With continuous cost reduction and device miniaturization, small UAVs (typically with weight not exceeding 25 kg) are now more easily accessible to the public; hence, numerous new applications in the civilian and commercial domains have emerged, with typical examples including weather monitoring, forest fire detection, traffic control, cargo transport, emergency search and rescue, communication relaying, and others [2]. UAVs can be broadly classified into two categories, fixed wing and rotary wing, each with their own strengths and weaknesses. For example, fixed-wing UAVs usually have high speed and heavy payload, but they must maintain continuous forward motion to remain aloft, and thus are not suitable for stationary applications like close inspection. In contrast, rotary-wing UAVs such as quadcopters, while having limited mobility and payload, are able to move in any direction as well as to stay stationary in the air. Thus, the choice of UAVs critically depends on the applications.

India’s water pollution situation waiting to explode as time bomb

A 2007 study found that discharge of untreated sewage is the single most important source of pollution of surface and ground water in India. There is a large gap between generation and treatment of domestic waste water in India. The problem is not only that India lacks sufficient treatment capacity but also that the sewage treatment plants that exist do not operate and are not maintained.

The majority of the government-owned sewage treatment plants remain closed most of the time due to improper design or poor maintenance or lack of reliable electricity supply to operate the plants, together with absentee employees and poor management. The waste water generated in these areas normally percolates into the soil or evaporates. The uncollected waste accumulates in the urban areas causing unhygienic conditions and releasing pollutants that leach into surface and groundwater.

A 1992 World Health Organization study reported that out of India's 3,119 towns and cities, just 209 have partial sewage treatment facilities, and only 8 have full wastewater treatment facilities. Downstream, the river water polluted by the untreated water is used for drinking, bathing, and washing. A 1995 report claimed 114 Indian cities were dumping untreated sewage and partially cremated bodies directly into the Ganges River Lack of toilets and sanitation facilities causes open defecation in rural and urban pill areas of India, like many developing countries. This is a source of surface water pollution.