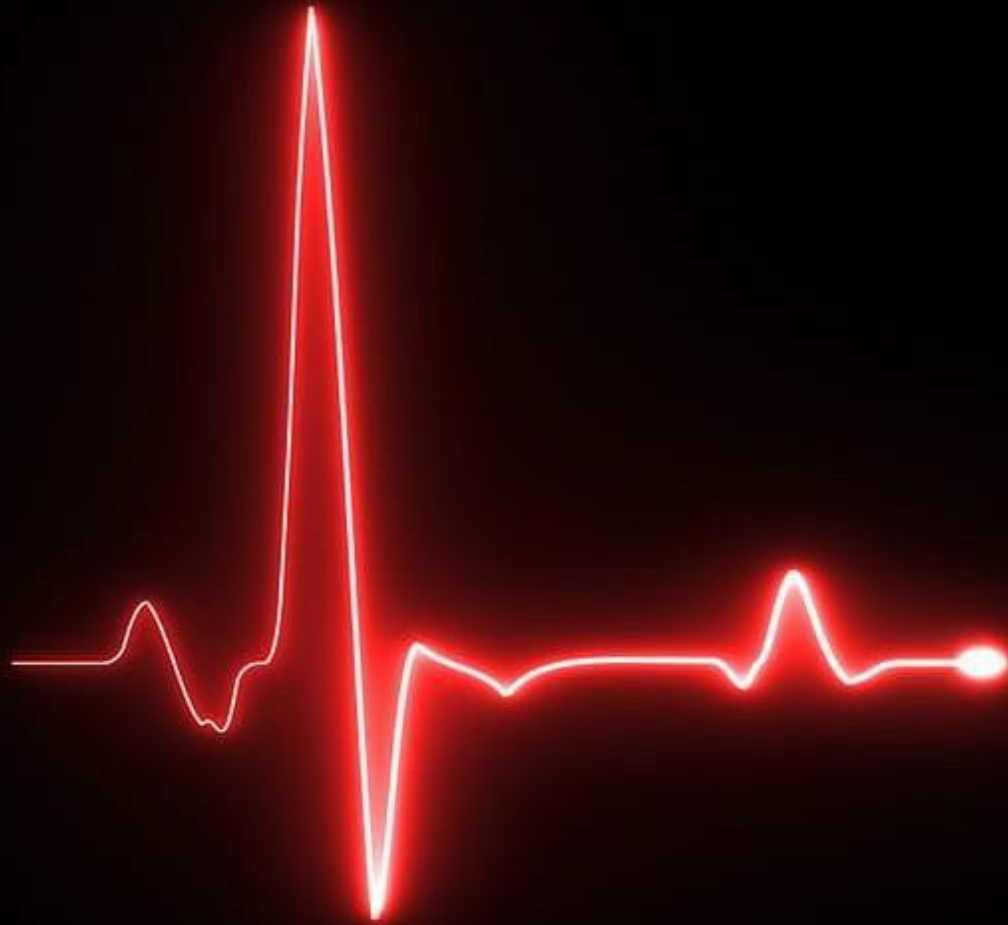


THE PULSE

NEWSLETTER
DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING



Vision

To emerge as a centre of academic excellence in the field of Electronics & Communication Engineering to address the dynamic needs of the industry upholding moral values.

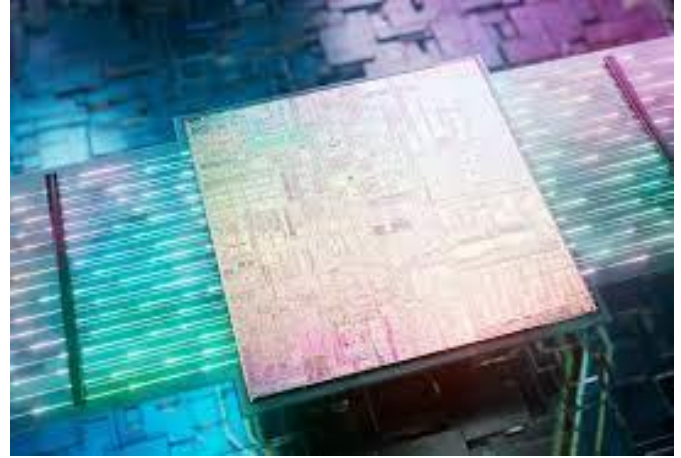
Mission

- Impart in-depth knowledge in Electronics & Communication Engineering to achieve academic excellence.
- Develop an environment of research to meet the demands of evolving technology.
- Inculcate ethical values to promote team work and leadership qualities befitting societal requirements
- Provide adaptability skills for sustaining in the dynamic environment

FACULTY CONNECT

Silicon Photonics - The solution for Datacentre

With the advent of technological advancements such as cloud services, artificial intelligence, big data, and 5G, data traffic is increasing at an alarming rate. The recent pandemic has pushed everyone into the digital world. It has become clear that most of our work can be done without physical presence. Data traffic spiked during COVID initial wave especially the social media and video conferencing applications. Video streaming sites such as YouTube, Netflix,



Prime etc. are among the major contributors to the daily network traffic. The amount of data transfer for the same content increases with resolution and time. The amount of data transfer within the data centre is even larger. One bit outside the data centre is equal to five to six bits inside the data centre. The insatiable demand for network bandwidth is the driving force for new data centre technologies. Increasing the number of data centres is an option but this comes with huge power consumption and cost. With the focus on meeting the growing network demands, the network operators are working on upgrading the hardware devices such as routers, switches, and servers, the optical interconnects between these devices are of growing importance in terms of both capital expenditure and operational cost. Today's network devices support greater than 100Gbps links, and the bandwidth of these devices is almost doubling every 2-3 years. Fibre optic cables have mostly replaced copper cables for transmitting data through these high-speed links. The optic cables carry data in the form of light pulses (infrared beams) at speeds reaching the speed of light. The fibre optic cables rely on optical transceivers at both ends to convert electrical signals to light pulses for transmission over the cable and to convert the light pulses back into electrical signals on the receiving side. These transceiver modules are key drivers of the performance of the fibre-optic link. These are the pluggable optical modules that convert electrical signals to optical signals and back again. They are inserted into the network device and terminate the fibre optic cabling that runs throughout the network's physical infrastructure.

Unlike the ASIC and CPU chips that act as the brains of the network and rely primarily on silicon-based transistors, optical transceivers rely on optical components such as laser diodes, photodiodes, and optical waveguides to manipulate and modulate light to carry information over fibre links. Networking, as well as High-performance computing systems, can immensely benefit from low-power/low-cost optical transceivers and new designs that reduce data movement in the electrical domain on the printed circuit boards. In

FACULTY CONNECT

photonic-integrated platforms, many of the optical and electrical components used to build a transceiver are packed into highly integrated chips called Photonics Integrated Circuits (PICs). Integrating all the components on a single substrate reduces the cost of building the transceiver and also reduces the power due to fewer coupling effects between the discrete optical components. Silicon photonics technology integrates the key photonics components and functionality of a high-speed transceiver on a silicon substrate. Silicon photonics benefits from leveraging the same advanced capabilities of electronic ASIC fabrication facilities to create highly integrated photonic circuits and devices with world-leading performance, and faster development and manufacturing timelines than is possible with traditional optical materials technologies. Silicon photonics technology has long been of interest in the optical networking industry and in recent years has gained a major foothold in the data centre network. The technology development for silicon photonics is largely focused on building and qualifying optical components and designs that can be used at the silicon fab to produce photonics systems integrated on a single chip. Research is underway to overcome the challenges and improve the efficiency to tap out the full potential of photonic communication to meet the futuristic network demands.

**- Dr Jesuwanth Sugesh,
ECEdepartment**

EVENTS

Highlights of the Month:

- Organized departmental level orientation session on NAAC held on 13.10.2022.
- Col. Jai Govind P, Dr. Chidambaram. S and Dr. Jesuwanth Sugesh R.G. have visited Army Service Corps(ASC) Training Centre, Bangalore on 12.10.2022, primarily focused on getting acquainted with the state-of-the-art facility available in the domain of VR, AI and other emerging technologies used at ASC training centre and to explore the possibility of academic collaboration, training for faculty/students in core engineering domain further.
- Dr. Aneesh V delivered a Talk on “Robotics and Smart Sensors” and Dr. Chidambaram S on “Applications of Hyperspectral Imaging in Precision Agriculture” under Faculty Mobility Program 2022-2023 of Junia ISA, Lille, France held on 18.10.2022.
- Dr. Chidambaram. S has delivered a Talk on “Applications of Hyperspectral Imaging in Precision Agriculture”, University of Technology, Sarawak, Malaysia on 27.10.2022.
- Dr. Praghash.K and Dr. Jesuwanth Sugesh.R.G participated in a TechTalk on “Applications of Hyperspectral Imaging in Precision Agriculture, University of Technology, Sarawak, Malaysia on 27.10 2022.
- Dr. Iven Jose and Prof. Delson.T.R presented a paper “Study on 5G Massive MIMO Technology Key Parameters for Spectral Efficiency Improvement Including SINR Mapping on Rural Area Test Case” in 2022 3rd Global Conference for Advancement in Technology (GCAT) held on 07.10.2022.
- Dr. Vinay Jha Pillai recognized as reviewer for Elsevier Journal, Oct 2022.
- Dr. Neethu P S authored a Book entitled as “Handbook on Machine Learning”, published by Book Rivers Publishers.

STUDENT CONNECT

Espionage

Are we aware that the tiny object in our hand secretly listens to us or spying on us? Yes, we are right. I'm pointing to the smartphone in our hand, which we simply can't live a day or even an hour without using it. Yes, I agree that there are a lot of advantages and uses for smartphones. But there are disadvantages too. Here, I want to talk about smartphones invading our privacy without our consent.

Consider everything your smartphone is doing for us today.

Like Counting our steps? listening to us? Navigating us to a new desired place? Counting our heartbeat? Yes, they are doing all these with our consent but the thing here is what is happening to all this data that we are giving. And this is done by some of those sensors you may never think of or even know about. They sense light, humidity, pressure, temperature, and other factors. The input data that we are providing in phones may be transmitted or shared in many ways (including SMS, MMS, USSD, Bluetooth, wireless Internet, or the exchange of physical memory cards).

Various Apps collect data from us, like names, credit card information, personal information, etc. Many also track location by using our phone's GPS and nearby cell towers.

Facebook monitors our browsing habits beyond its own platform by tracking what we watch, read and place in our shopping cart. Companies like Google combine data from many of its free apps, which eventually creates a user profile for ad targeting purposes. As a result, if we are doing a Google search for a particular kind of outfit or restaurant, we can gradually see ads via our web browser and Facebook or Instagram.



When you install a new application on your phone without reading all the terms and conditions, we just give the consent but that would be problematic. For example, Facebook tracks every step of our including the places we physically visit. Facebook requires us to give permission to log your activity on the site and that data is used to

provide advertising most relevant to us. We cannot stop Facebook from collecting this information it's the deal we make when we are signing up. And therefore, we must read the terms and conditions before accepting them. And as we all know Facebook also owns WhatsApp and Instagram, so it pools all the data it collected from us.

STUDENT CONNECT

You can limit access by not signing into the chrome browser and by not using the universal sign-on options offered by Google and Facebook. But we cannot guarantee that our data or location is not being collected.

On the other hand, monitoring can be beneficial.

During the pandemic, contact tracing helps to protect us, our families, and our community. It tracks down anyone who might have been infected by a person who was recently diagnosed so those contacts can quarantine themselves and prevent the further spread of the virus. Being monitored is not always bad. In this case, it is a useful tool to keep ourselves and others safe and healthy. So, taking everything into account we must be cautious while accepting the terms and conditions before installing any application on our phones. It's not like we can restrict it, but we can limit it. The cell phone had already replaced our watches, Calendar, cameras, and even that morning disturbance (or) melodious wake-up call for some of us (alarm clock). At least, Don't let it replace our family.

**-Polamarasetty Arpitha,
6BTEC**

Department Newsletter Team

Faculty in-charge

Dr. Syam Chandran K – syam.chandran@christuniversity.in

Design, content and editing

Segu Sai Nikhitha- segu.sai@btech.christuniversity.in

Kamalesh Kumar- kamalesh.kumar@btech.christuniversity.in

Kindly share your thoughts and research experiences via e-mail to our team, and be featured in next month's issue!

