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DEPARTMENT OF **ELECTRONICS AND COMMUNICATION ENGINEERING (ECE)**

EXPLORE, DREAM, DISCOVER

GENESIS

IGNITING THOUGHTS

MONTHLY NEWSLETTER

FEBRUARY 2022 ISSUE 49

VISION

To be recognized at national and international level for excellence in education and research in Electronics and Communication Engineering.

MISSION

- Inculcating leadership qualities, adaptability and ethical values
- Imparting quality education in the field of electronics, communication, and related areas to meet the challenges in industry, academia and research
- Nurture the growth of each individual by providing a dynamic and conducive learning environment.

DEPARTMENT ACTIVITIES AND ACHIEVEMENTS

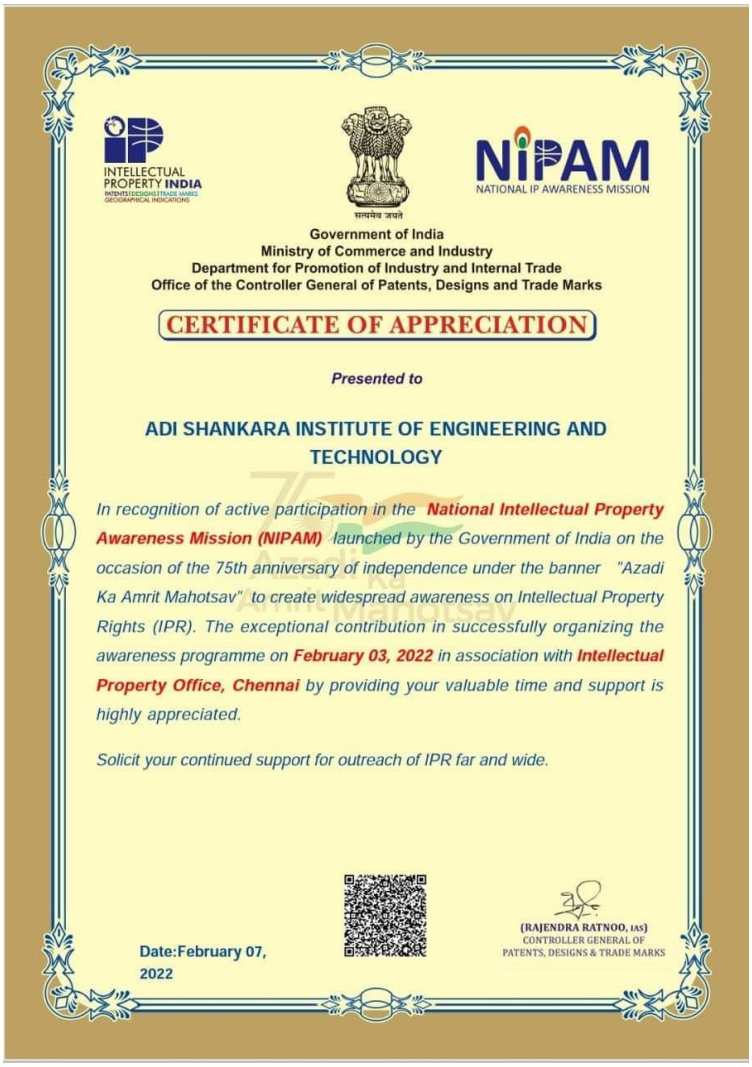
AWARENESS PROGRAM ON INTELLECTUAL PROPERTY RIGHTS

Awareness Programme on Intellectual Property Rights under the National Intellectual Property Awareness Mission (NIPAM) jointly organized by Patent Office, Chennai, KSCSTE - IPRICK and Adi Shankara Institute of Engineering and Technology was conducted on 3rd February 2022 in online mode.

On the occasion of the 75th anniversary of Independence, the Government of India has launched the National Intellectual Property Awareness Mission (NIPAM) under the banner "Azadi ka Amrit Mahotsav" to create widespread awareness on IPR in association with Intellectual Property Office, Department for Promotion of Industry and Internal Trade (DPIIT), Govt. of India. Under the Mission, awareness on IPR would be imparted to students and the public during the period from 15 August 2021 to 15 August 2022.

Intellectual Property Rights Information Centre - Kerala (IPRIC-K) functioning at KSCSTE, which is the Nodal Agency of the Kerala State for Intellectual Property Rights related matters and services is coordinating the activities under the Mission in Kerala in association with Patent Office, Chennai.

Smt Anjana Haridas presently working as the Examiner of Patents and Designs in the Indian Patent Office, Chennai. handled the session on the overview of Intellectual Property Rights and their significance. Students and staff members of ASIET attended the session.



RECENT PLACEMENTS

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Electronics & Communication Engineering

Congratulations!

For getting placed at
Sutherland

2018-2022
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FINTO SHAJAN


SIVANJANA K K


ASHWIN M B


FARHAN NAJEEB


MEGHA JOSE

SUMAN MENON MTECH COMMUNICATION ENGINEERING (2019-21) BATCH GOT PLACED IN TATA ELXSI

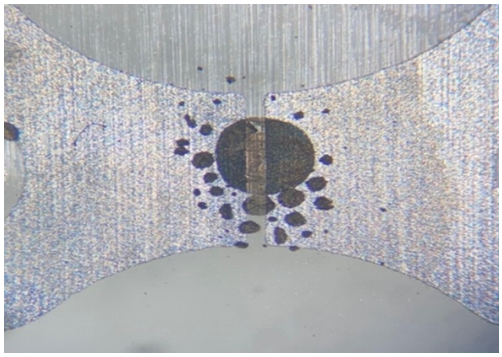
TEACHER'S ZONE

LIQUID ELECTRONICS- ENHANCED FUNCTIONALITY AND SUSTAINABILITY FOR PRINTED MICROCHIPS AND WEARABLE SENSORS

Author: Ms.Archana Aniyan, Assistant professor, Department of ECE

New research from physicists at the University of Sussex will 'significantly advance' the new technology area of liquid electronics, enhancing the functionality and sustainability of potential applications in printed electronics, wearable health monitors and even batteries.

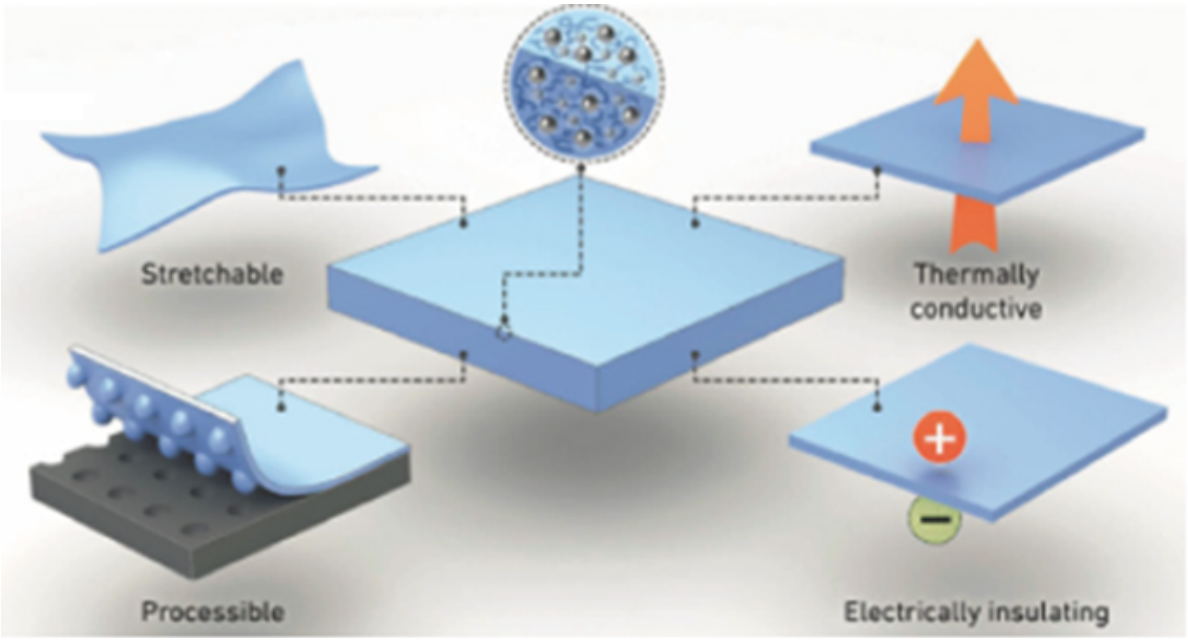
In a research paper published in ACS Nano, the Sussex scientists have proposed work to wrap emulsion droplets with graphene and other 2D materials by reducing the coatings down to atomically-thin nanosheet layers. In doing so they were able to create electrically-conducting liquid emulsions that are the lowest-loading graphene networks ever reported -- just 0.001 vol%. This means that the subsequent liquid electronic technology -- whether that might be strain sensors to monitor physical performance and health, electronic devices printed from emulsion droplets, or even potentially more efficient and longer-lasting electric vehicle batteries, will be both cheaper and more sustainable as they require less graphene or other 2D nanosheets coating the droplets.



Graphene-wrapped emulsion droplets deposited onto electrodes for single-droplet thin-film electronic devices. Image Credit: University of Sussex.

Another significant development was that the scientists can now make these electronic droplet networks using any liquids because they have discovered how to control which liquid droplets are wrapped in graphene, which means that they can design the emulsions specifically to the desired application. Research Fellow Dr Sean and his team working on Material Physics at the University of Sussex School of Mathematical and Physical Science explains the science behind the development in which the potential of 2D materials, such as graphene, their electronic properties and their processability. They demonstrated process to harness the surface area of our nanosheet dispersions to stabilise emulsion droplets with ultra-thin coatings. The tuneability of these emulsions allows to wrap 2D materials around any liquid droplets to exploit their electronic properties. This includes emulsion inks, in which, we've discovered that droplets can be deposited as droplets without the coffee ring effect which hinders printing of conventional functional inks, potentially enabling single-droplet films for printed transistors and other electronic devices.

Another exciting development reported is design and control our emulsions towards specific applications such as wrapping soft polymers such as silicone for wearable strain sensors that exhibit increased sensitivity at low graphene loading, and emulsion assembly of battery electrode materials to enhance the robustness of these energy storage devices.



Professor of Experimental Physics at the University of Sussex, Alan Dalton, explains why this development is exciting: "In bringing the graphene coatings of the liquid droplets down to atomically-thin layers and in opening wide the potential for real-world applications by being able to do so with any liquid material, this research development will significantly advance the emerging and scientifically exciting field of liquid electronics."

Reference:

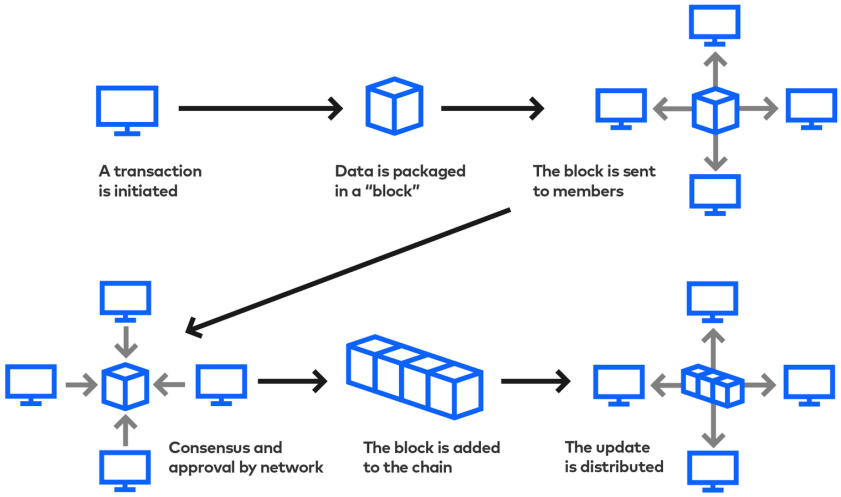
1. University of Sussex: “Liquid electronics: Wrapping droplets in graphene for printed microchips and wearable sensors”, ScienceDaily

2. Sean P. Ogilvie, Matthew J. Large, Marcus A. O’Mara, Anne C. Sehnal, Aline Amorim Graf, Peter J. Lynch, Adam J. Cass, Jonathan P. Salvage, Marco Alfonso, Philippe Poulin, Alice A. K. King, Alan B. Dalton. Nanosheet-Stabilized Emulsions: Near-Minimum Loading and Surface Energy Design of Conductive Networks. ACS Nano, 2022; DOI: 10.1021/acsnano.1c06519

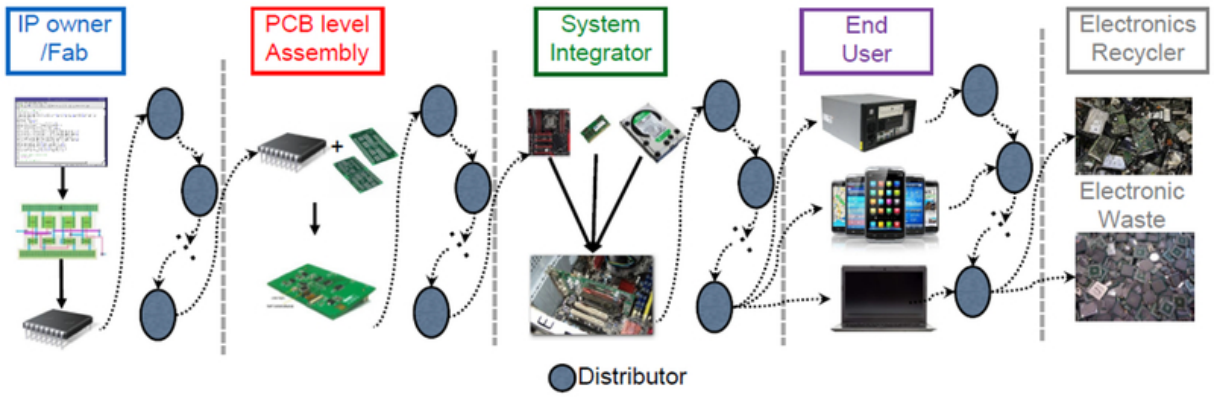
ELECTRONICS SUPPLY CHAIN INTEGRITY ENABLED THROUGH BLOCKCHAIN TECHNOLOGY

Author: Mr. Samuel Sabu Thomas, S5 ECE B

In the Bitcoin scheme, a blockchain is an ordered, back-linked list of blocks of transactions. In most literature, the blockchain is visualized as a vertical stack, in which all blocks are layered vertically, and the first block serves as the stack foundation. In this visualization, one feature associated with each block is its "height", that is used to quantify the distance from it to the first block. Within the blockchain, each block can be identified by its header hash and block height number. The header hash of 32-byte length is generated by hashing the block header twice through the SHA256 cryptographic algorithm. Besides the identifier information, each block also refers to a previous block, which is called the parent block. A block keeps the header hash of its parent in its header to link and backtrack. In this stacked architecture, each block has just one parent in the blockchain.



During the past few decades, the business model of the semiconductor industry has drastically changed. Previously, design, fabrication, and testing were usually completed by a single entity. With the increasing costs of fabrication at advanced process nodes, most semiconductor companies have chosen to operate as fabless design houses and outsource manufacturing to external foundries. This model dramatically benefits the whole consumer electronics industry, since new products with more features and functionalities can be released with shorter turnaround times. It is common for fabricated ICs to go through multiple stages of the electronics supply chain depending on the functionality and application of the component. The participants of the electronics supply chain can be roughly classified into the following categories: IP owner/foundry(fab), distributor, PCB assembler, system integrator, end user, and electronics recycler.



- IP owner refers to the participants that either design the complete IC, PCB, or system by themselves or source various intellectual property (IP) cores from multiple vendors to produce a complete system-on-chip (SoC).
- Foundry (also called fab) is the fabrication facility that gets the design file (e.g., GDSII format for IC, or Gerber format for PCB) from the IP owner and manufactures electronic ICs or PCBs as per its contract with the IP owner. The foundry may provide packaging services to put the die into the chip package, or it may send the wafer to another packaging facility. This is the step where the electronic design becomes a physical entity (IC or PCB).
- PCB assemblers and system integrators (e.g., original equipment manufacturers in the supply chain) refer to the parties who use ICs and PCBs to build board-level or system-level products.
- Distributors include all the possible buyers and sellers of ICs and board-level systems. They act as the transportation channel among the previously described parties.
- Electronics recyclers are the participants responsible for handling E-waste (the discarded end-of-life entity of the electronic components and systems). Such E-waste consists of devices that have reached the end-of-life.

To build an authentication infrastructure via blockchain, a database accessible to all the registered participants of the proposed trusted supply chain should be maintained to record the ECIDs of ICs. However, in practice, design houses may prefer to keep a record of its electronic products private. Therefore, it is difficult for a user to check the authenticity of a set of chips if they are not directly bought from these companies. Another limitation is that for an assembler which uses a large number of different chips, it is inconvenient to validate the authenticity of all chips from various companies. These limitations imply that before applying blockchain to track electronic devices, a proper ID database and accessing scheme should be designed first.

Reference:
1. "Blockchain Technologies: Blockchain Use Cases for Consumer Electronics" - Jong-Hyouk Lee
2. "Electronics Supply Chain Integrity Enabled by Blockchain" - Xiaolin Xu, Fahim Rahman, Bicky Shakya, Apostol Vassilev, Domenic Forte and Mark Tehranipoo

STAFF ACHIEVEMENTS

Dr. Bobby Mathews, HOD

1. Participated in NIPAM - National Intellectual Property Awareness Mission on 03.02.22.
2. Participated in 32nd Annual State Faculty Convention under ISTE, KERALA Section on 19.02.22

Mr. Sreerag M

1. Cordinated an awareness Programme on Intellectual Property Rights under the National Intellectual Property Awareness Mission (NIPAM) for the students and staff members of ASIET

STUDENT ACHIEVEMENTS

BATCH	NAME	PROGRAM	CONDUCTED	DATE
2018-22	Farhan Najeeb	VoC training of YIP	K-DISC	12/15/2021
2018-22	Farhan Najeeb	Tata imagination challenge	Tata sons	1/31/2022
2018-22	Farhan Najeeb	Hero campus challenge season 7	Hero motocorp	2/21/2022
2020-24	Karthik S Mohan	Python Machine Learning Project: SPAM classification in GMAIL	TechLearn	2/9/2022
2020-24	Giftson Varghese	Masters on data science	ASIET	6/1/2022

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