SEMESTER 1

LBS INSTITUTE OF TECHNOLOGY FOR WOMEN , POOJAPPURA
TRIVANDRUM

ELECTROVIBES

DEPARTMENT OF ELECTRONICS AND COMMUNICATION

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INTRODUCTION

Welcome to the Latest Edition of ElectroVibes!

We are excited to present this sem's newsletter, bringing you the latest updates and significant events from our college.

We, the students of the Electronics and Communication Engineering Department (Batch 2023-2027) at LBS Institute of Technology for Women, Poojapura, take great pride in sharing this edition with you. A momentous milestone in space technology, WESAT (Women Engineered SATellite), stands as the nation's first satellite developed entirely under the leadership of women—an achievement that fills us with immense pride.

In this issue, we also highlight Prayaag 3.0, the annual tech fest of LBS Institute of Technology for Women. This dynamic event serves as a hub for innovation, creativity, and technological advancements.

Join us as we celebrate the remarkable achievements of our peers, explore inspiring success stories, and delve into initiatives that drive progress and transformation.

Happy reading!

Hyperloop

The Future of High-Speed Transportation

-Bhadra D Nair

Technical Details

- Speed: Up to 1,200 km/h (750 mph)
- Acceleration: 0-1,200 km/h in 2 minutes
- Deceleration: 1,200 km/h to 0 in 2 minutes
- Tube diameter: 3.3 meters (10.8 feet)
- Tube material: Steel or concrete

Benefits

- Energy efficiency: 2-3 times more efficient than high-speed rail
- Low operating costs: Reduced energy consumption and maintenance
- High capacity: Up to 3,000 passengers per hour

Transportation has always played a crucial role in human advancement, evolving from horse-drawn carriages to high-speed trains and airplanes. Recently, a groundbreaking concept known as the Hyperloop has surfaced, offering the promise of ultra-fast, efficient, and sustainable travel. First introduced by Elon Musk in 2013, the Hyperloop is a transportation system that utilizes vacuum tubes, enabling passenger pods to reach speeds over 1,000 km/h. This innovation could drastically cut travel times between major cities to just a few minutes. By eliminating air resistance and employing magnetic levitation, Hyperloop pods can glide above the track, achieving speeds comparable to airplanes while using significantly less energy.

The Hyperloop functions on the principle of low-pressure tube transport, which greatly minimizes air resistance and friction. Key components of a Hyperloop system include vacuum tubes, passenger pods, linear induction motors, and solar panels. The vacuum tubes create a near-frictionless environment, facilitating high-speed travel. Passenger pods, designed for aerodynamic efficiency, navigate through these tubes using magnetic levitation (maglev) or air bearings. Linear induction motors supply the necessary propulsion, while solar panels are anticipated to power the system, positioning it as an eco-friendly alternative to conventional transportation.

One of the most significant advantages of the Hyperloop is its unparalleled speed. With potential velocities of 1,000-1,200 km/h, a trip from Delhi to Mumbai (1,400 km) could take just over an hour, in contrast to more than two hours by airplane or over 14 hours by train.

This could transform intercity travel, making long-distance commuting a reality. Furthermore, the Hyperloop is expected to be highly energy-efficient, consuming less power than airplanes and high-speed trains.

Many proposed designs include solar panels, promoting a carbon-neutral mode of transportation. Another major benefit is the alleviation of traffic congestion, as the system could significantly reduce the number of vehicles on the roads.

Challenges

1. Scalability: Building a large-scale network
2. Safety: Ensuring passenger safety at high speeds
3. Regulation: Developing regulatory frameworks
4. Cost: Estimating and managing construction costs

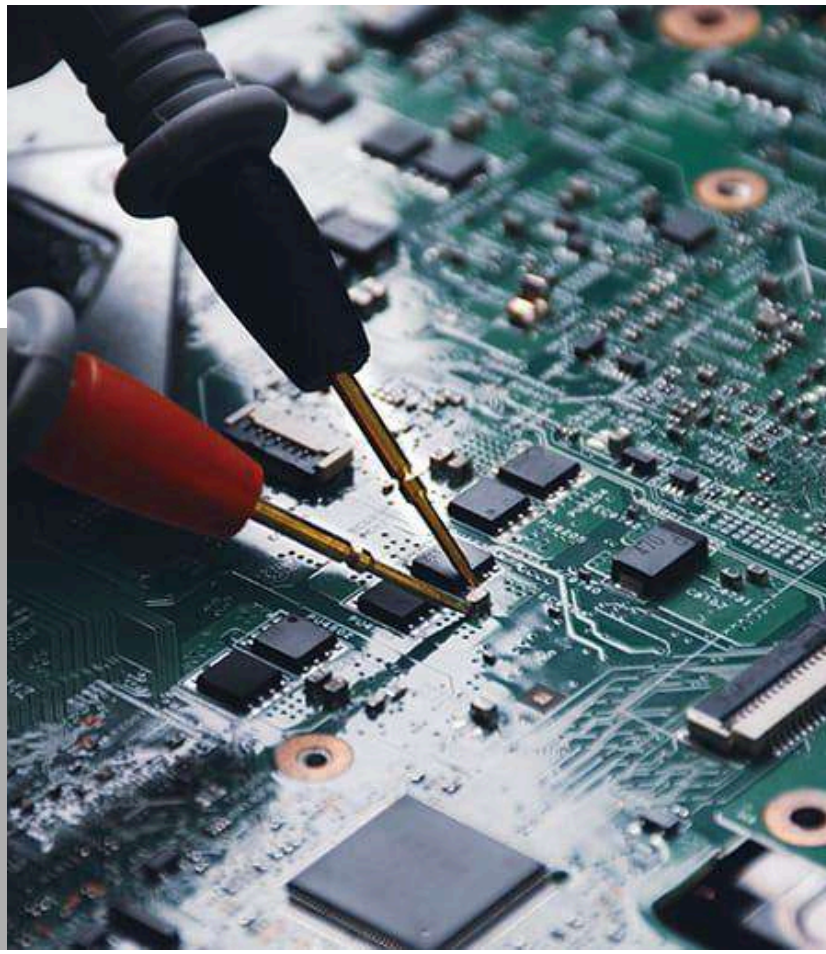
Current Status

1. Testing: Successful tests in Nevada, USA
2. Commercialization: Plans for operational systems in the UAE, India, and the USA
3. Partnerships: Collaborations with governments, companies, and universities

VLSI

Shaping the Future of Technology

-Manjima Ajith



Technical Details:

- MOSFET technology
- Electronic Design Automation tools
- Semiconductor manufacturing
- Million+ transistors per chip
- Scaling for size reduction

Benefits:

- Compactness
- High performance
- Energy efficiency
- Cost-effectiveness
- Increased functionality

The Very-Large-Scale Integration (VLSI) process entails consolidating an enormous number of transistors onto a solitary chip, thereby facilitating the creation of electronic devices that are remarkably compact, powerful, and energy-efficient. As a fundamental building block of modern electronics, VLSI catalyzes technological advancements across various sectors, including consumer electronics, telecommunications, and artificial intelligence.

Key Components of VLSI:

1. Transistors: The building blocks of ICs, primarily using MOSFET technology.
2. Design Tools: Electronic Design Automation (EDA) tools like Cadence, Synopsys, and Mentor Graphics help create complex circuits.
3. Fabrication: Semiconductor manufacturing processes using materials like silicon and techniques such as photolithography.

Advantages of VLSI:

1. Compactness: Reduces the size of devices.
2. High Performance: Enables faster processing speeds.
3. Energy Efficiency: Essential for portable and battery-operated devices.
4. Cost-Effectiveness: Mass production lowers per-unit costs.
5. Reliability: Minimizes the risk of failure through fewer interconnections.

Challenges in VLSI

1. Power Dissipation: Managing heat in densely packed circuits.
2. Complexity: Designing and verifying circuits with billions of transistors.
3. Fabrication Costs: High initial investment for advanced manufacturing.
4. Time-to-Market: Balancing speed and accuracy in the design process.
5. Security: Protecting chips from vulnerabilities and attacks.

Applications of VLSI:

1. Consumer Electronics VLSI technology has revolutionized the consumer electronics industry, enabling the development of smartphones, tablets, gaming consoles, and smartwatches. These devices offer advanced features, high-speed performance, and energy-efficient designs, significantly enhancing user productivity and overall experience.
2. Automotive Industry In the automotive sector, VLSI technology has enhanced vehicle safety and functionality. Electronics systems, Engine Control Units (ECUs), and Advanced Driver Assistance Systems (ADAS) rely on VLSI chips to enable real-time vehicle diagnostics, autonomous driving, and the detection of objects, lanes, and road signs.

3. Telecommunications -industry has greatly benefited from VLSI technology, facilitating the advancement of 5G networks, high-speed communication infrastructure, and modern mobile devices. VLSI-based chips are integral to network equipment like switches, routers, and base stations, ensuring fast and reliable data transmission.
4. Healthcare VLSI has played a pivotal role in advancing healthcare by powering medical imaging systems, wearable health trackers, and implantable medical devices. These innovations support accurate diagnoses, real-time health monitoring, and improved patient care.

PRAYAAG 3.0

Prayaag 3.0

On September 29, 30 & October 31 2023, LBSITW Witnessed The Grandeur Of Its Annual Tech Fest, Prayaag 3.0. This Eagerly Anticipated Event Brought Together Tech Enthusiasts, Innovators, And Thinkers For A Day Of Exploration, Learning, And Celebration Of Technological Advancements."

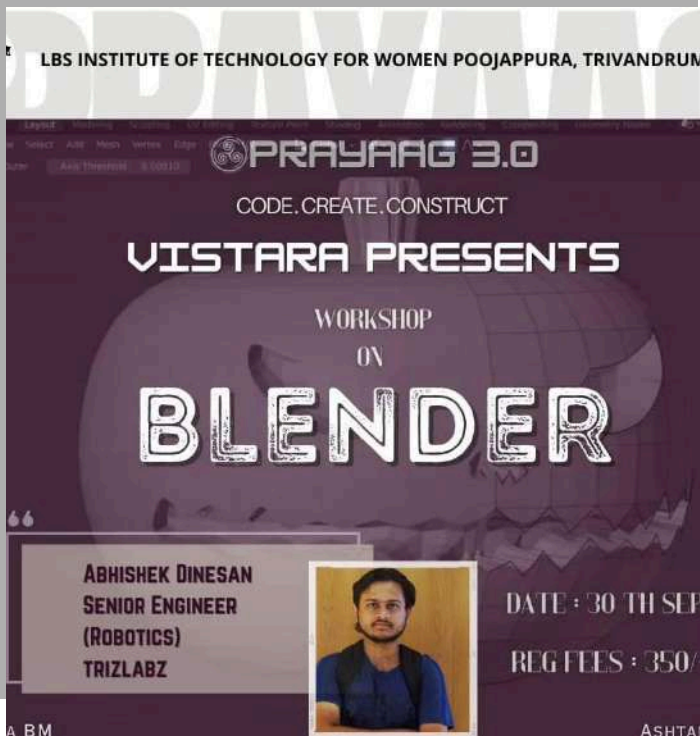
The Fun Realm

Workshop On Flutter

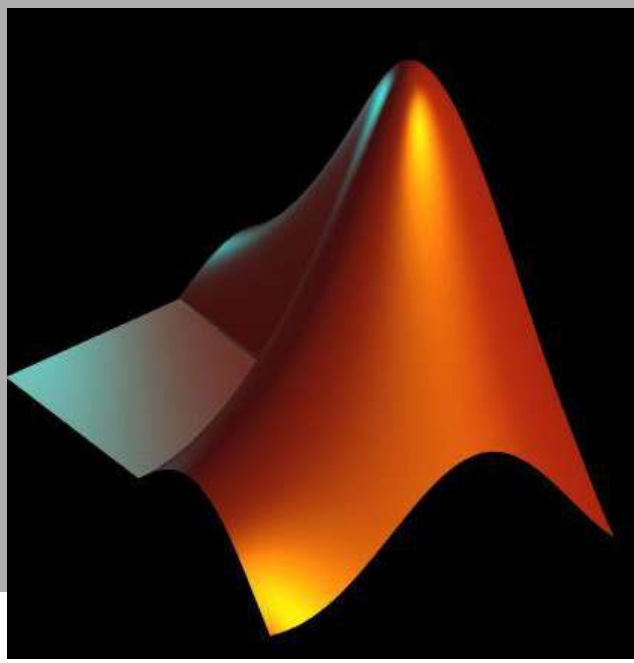
The Event Workshop On Flutter Of The Prayaag 3.0 Conducted By LBS Institute Of Technology For Women The Workshop Aimed To Introduce Participants To The Fundamentals Of Flutter, A Popular Cross-Platform Mobile App Development Framework. The Event Covered The Basics Of Flutter, Including Widgets, Layouts, And Navigation.The Workshop Successfully Achieved Its Objective Of Introducing Participants To The Fundamentals Of Flutter And Cross-Platform Mobile App Development. The Event Received Positive Feedback, And The Organizers Are Planning To Conduct Similar Workshops In The Future.

Workshop On Blender

The Event "PRAYAAG 3.0" At LBS Institute Of Technology For Women, Poojappura, Trivandrum, Featured A Workshop On Blender, Presented By VISTARA. The Workshop, Which Took Place On September 30th, Was Led By Abhishek Dinesan, A Senior Engineer In Robotics From Trizlabz. Participants Had The Opportunity To Explore The World Of 3D Modeling And Animation Using Blender, A Popular Open-Source Software. The Event Provided Hands-On Learning And Practical Insights Into Blender's Capabilities. This Workshop Was A Great Opportunity For Students And Professionals Interested In 3D Design And Animation To Enhance Their Skills.

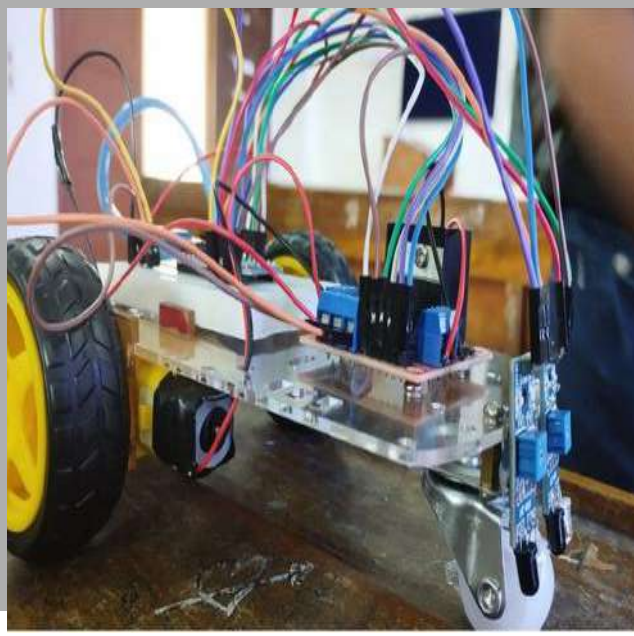


Worshop On Matlab



MATLAB Online Workshop Hosted By VISTARA'23 In Association With PRAYAAG 3.0 On 21st & 22nd Sept 2023. The Online Workshop Aimed To Introduce Participants To The Fundamentals Of MATLAB, A High-Level Programming Language And Environment For Numerical Computation And Data Analysis. The Event Covered The Basics Of MATLAB, Including Data Types, Operators, Control Structures, Functions, And Data Visualization.The Online Workshop Successfully Achieved Its Objective Of Introducing Participants To The Fundamentals Of MATLAB And Data Analysis. The Event Received Positive Feedback, And The Organizers Are Planning To Conduct Similar Workshops In The Future.

Robotics Revolution: Hands-On Learning With Line Follower Robots



Participants Embarked On An Immersive Journey Into Robotics, Designing, Building, And Programming Line Follower Robots. The Workshop Covered Robotics Fundamentals, Sensor Technologies, And Hands-On Assembly. Under Expert Guidance, Attendees Mastered Programming Techniques, Enabling Autonomous Navigation. This Interactive Experience Provided Practical Skills In Robotics Design, Programming, And Problem-Solving.

The Workshop's Emphasis On Practical Application Allowed Participants To Troubleshoot And Refine Their Robots In Real-Time, Fostering A Collaborative Environment Where Insights And Problem-Solving Strategies Were Shared. The Grand Finale Featured Participants Testing Their Line Follower Robots On A Custom-Designed Course, Showcasing Their Programming And Design Expertise.

By The End Of The Session, Participants Had Not Only Created Functional Line Follower Robots But Also Gained A Deep Understanding Of Robotics Principles And Practical Skills In Designing Autonomous Systems.

EXPLORICA 5.0

Annual Flagship Event Of IEEE SB LBSITW
Explorica 5.0:Where Tech, Threads And Thrills Converge

The IEEE Student Branch Of LBSITW Proudly Hosted Its Annual Flagship Event, Explorica 5.0, On December 25-26, 2023. This Two-Day Extravaganza Brought Together Students, Professionals, And Industry Experts For A Weekend Of Learning, Networking, And Exploration. Featuring An Array Of Workshops And Talk Sessions, Explorica 5.0 Provided A Platform For Attendees To Delve Into The Latest Technologies, Share Knowledge, And Spark Innovative Ideas

Event Highlights

1. Think Fast, Talk Smart: Panel Discussion On Smart Communication Technologies
2. Beyond The Campus: Panel Discussion On Transitioning From Academia To The Professional World
3. Robocodigo: Workshop On Arduino Projects And Autonomous Robots

Achievements

- ISO-Certified Certificates Provided By Stem Robotics International
- Collaborations With Prominent Space Agencies And Industry Experts
- Inspiring Conversations On Innovation, Technology, And Career Development

WESAT

WESAT: A Groundbreaking Achievement in Space Exploration

We are thrilled to announce that LBSITW has made history by developing India's first satellite payload, WESAT (Women Engineered Satellite), led by an all-women team!

WESAT TEAM

A Pioneering Effort

WESAT is the result of a four-year collaborative effort between our institute's Space Club and prominent space agencies, including VSSC, ISRO, IN-SPACE, and the Dept. of Space. Despite the challenges posed by the pandemic, our team persevered and achieved ISRO's approval for the launch, scheduled for November 2023.

Mission Objective

WESAT aims to measure UV radiations in space and on earth's surface, providing invaluable insights into atmospheric warming and health risks, with a specific focus on Kerala. This project embodies our institution's commitment to innovation, gender equality, and making a positive impact on society.

A Milestone in Aerospace Engineering

WESAT represents a significant milestone in aerospace engineering, demonstrating the capabilities of an all-women team in leading a complex space project. Our institute is proud to be the only women's institute in India and the first in Kerala to achieve this feat.

Media Recognition

Our project has garnered extensive media coverage in prestigious newspapers (The Hindu, The Indian Express, Malayala Manorama, Vasundhara) and telecasted on prominent TV and YouTube channels (Asianet, Manorama, ETV Bhara

All-woman team's small satellite enters

SOVI VIDYADHARAN @TPuram

IT WAS a proud moment for students and faculty of Lal Bahadur Shastri Institute of Technology for Women (LBSITW) when a small satellite developed by them was successfully placed in orbit as part of the PSLV C58 mission that was launched by ISRO on Monday.

The Women Engineered SATellite' (WESAT), designed fully under the supervision of women, would measure the ultraviolet (UV) index of the sun and also study UV radiation effects on earth, particularly over Kerala.

Being the only self-powered payload in the PSLV C-58 mission, WESAT was capable of capturing data even before reaching its orbit located at an altitude of 350 km from the earth's surface.

"It was indeed a proud moment for us as our payload was the first to transmit data from the moment the heat shield got separated, at around three minutes after lift-off," Principal Investigator of the WESAT project Dr Lizy Abraham told *TNIE* from Sriharikotta where a 40-member team from LBSITW witnessed the launch.

The data from WESAT was received by ISRO Telemetry, Tracking and Command Network (ISTRAC), Bengaluru. Around 23 minutes after lift-off, the satellite was placed on orbit, said Lizy who also is also the coordinator of LBSITW's

Space Club that ha student members oped the satellite.

"The students joyed when the ISR and the PSLV miss referred to our sm as a symbol of wo erment," she sai crowning moment dent team whose over the past five WESAT possible.

The satellite is eq UV sensors and sol sensors, providin data for climate cha and health risk as Higher Education Bindu hailed th launch as a milest country's space e history.

Bindu had present as funding grant, under the Central scheme NIDHI PR corporate social res funds, for the dev WESAT.

Students and faculty members of Lal Bahadur Shastri Institute of Technology for Women with ISRO chairman S Somanath after the launch of WESAT on Monday

> The students were overjoyed when the ISRO chairman and the PSLV mission director referred to our small satellite as a symbol of women empowerment
>
> Dr Lizy Abraham, principal investigator, WESAT project

Government Partnerships

We have signed MoUs with VSSC, ISRO, IN-SPACE, Dept. of Space, and the Govt. of India for launching WESAT in the upcoming PSLV mission. The project received funding from the central government through DST Nidhi Prayas scheme and from the state government via Kerala Startup Mission, with a total funding of 30 lakhs from the Government of Kerala.

Conclusion

WESAT represents a milestone in space technology and gender equality, demonstrating the remarkable capabilities of women in aerospace engineering. Through dedication, collaboration, and innovation, WESAT is shedding light on the impact of UV radiation and changing the narrative in space exploration.

VISION AND MISSION OF THE INSTITUTION

Embarking Excellence

VISION

To become a center of excellence in electronics, communication and instrumentation to facilitate professional education and research keeping higher the level of value systems. To provide intellectual services for society and industry by application of electronics, communication and engineering

MISSION

To be a center of academic excellence empowering women in the technical domain. To surpass competitions with confidence and build successf l careers for themselves, setting an example for the society