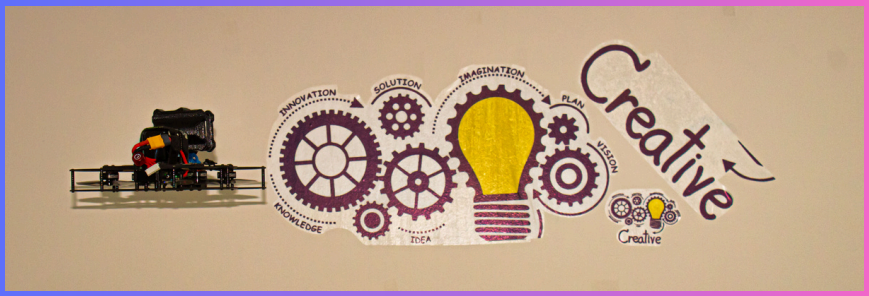
GREEN COMPUTING RESEARCH VERTICAL

Intelligent System Design Lab

Lab coordinator: Dr. E. Poovammal
Faculty In-charges: Dr. B. Sowmiya & Dr. B. Ida Seraphim
Programmer: Ms. Sangeetha



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LET'S PLUNGE INTO THE JOURNEY

Lab OVERVIEW

INTELLIGENT SYSTEM DESIGN LAB
(Supported by SIGETECH)

The Department of Computing Technologies has partnered with M/S. SiGeTech,- a technical expert in providing innovative technology solutions to empower the industry, academic Institutions, and research labs, through SRM Alumni Mr. Manojkumar, Scientific advisor to setup Intelligent system Design Lab. This Lab is set up by a team of faculty members who are contributing to the domain Green Computing.

Year of Establishment: July 2023

Web portal: http://tinyurl.com/GreenComputingVertical

Advisory Panel Member

Dr. Veera Jagadeeshwar,
Post Doctoral Fellow,
Singapore Technical University- Design, Singapore & Advisor-
Edurobo Technologies, Singapore

Vision: IT & AI towards Sustainable Developments.

Mission:

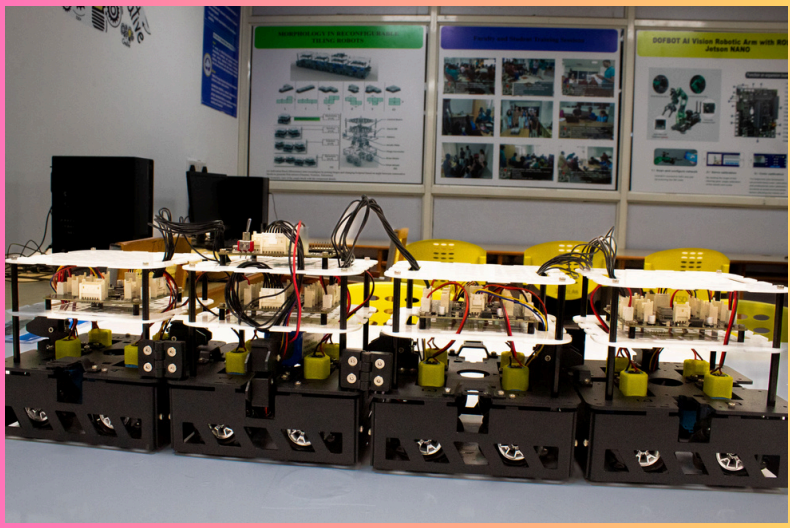
➢ To Design and Develop Cost Effective Smart Products with the Reduced Impact of Technology on the Environment

➢ Intelligent Automation

➢ Maximizing the process of Automation to Achieve Sustainable Economies and Energy Transitions

Components

Smorphi with AI Features



SBC: NVIDIA GPU
Zed 2 OR Real Sense + IMU Tetris-inspired educational robot

Hinge Modules: 4 Modules

Configuration: 7 Configurations

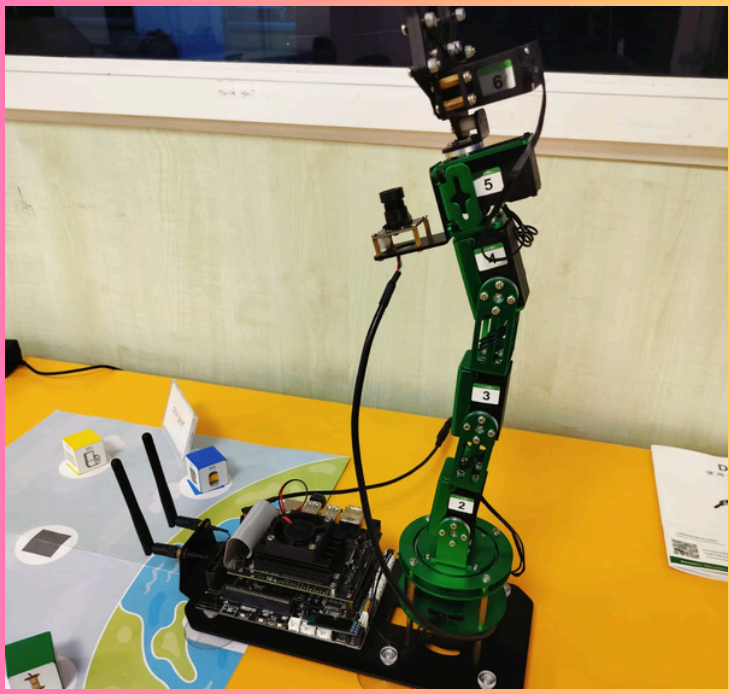
Microcontroller Chip: Esp32

Power:14.4v DC

Sensors:IR, Ultrasonic, Sound, Light, Temperature, IMU, Camera

Components

6 DoF Mini Arm



AI Computing power: Quad-core ARM A57 + 128-core NVIDIA Maxwell

Steering gear scheme: 15kg * 5 + 6kg * 1 Serial Bus Smart Servo

Sensors: Wide-angle Camera

Power Scheme: 12V5A power adapter

Mechanical arm material: Anodized aluminum

Assembled size: 303*135*473 mm

Weight after assembly: 1256g

Components

Mini PC

Lidar (360 Degree)

STM 32

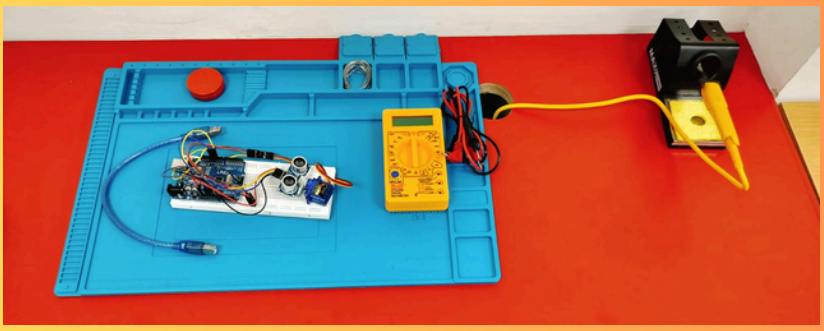
Realsense Camera

ZED Camera

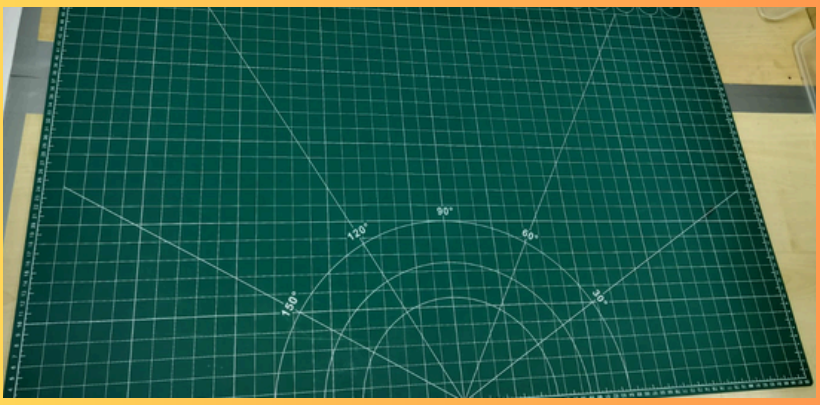
Jetson Nano Developer Kit

Components

Soldering station & Cut Mat Working Area



Sensors, Motors and Jumper Wires



Training session I

ISD Lab Training Session I
Organized by
Department of Computing Technologies
Date: 27/07/2023
Participants
III Year, II Year, and Faculty Members – Computing Technologies

M/S. SiGeTech and the Department of CTech organized an ISD Lab Day 1 Training Programme in the SRM Tech Park on 27th July, 2023 order to provide an embedded platform for learning about Intelligent System Design Lab (ISD). The event was held in TP-1515 Computing Lab - S at 10.00 AM with 28 student participants and faculty members.

The following sessions were conducted
1) Welcome Speech 2) Guest Presentation 3) Components Demonstration on the theme.

Topics Covered in the session
1. Introduction about M/S. SiGeTech and Smorphi.
2. Smorphi Technical Introduction
3. Jetson Nano, Zed 2, 2D Lidar, Robotic Arm.

Resource persons from (M/S. SiGeTech)

1. Mr. A.Govindharaj, Embedded and Design Engineer
2. Mr. Tirumalaghan – R&D Software Developer
3. Mr. Vishal – HR & Admin
4. Mr. Sunil – Software Developer Trainee.

Student Interaction - Dr.E.Poovammal

Hands on - Smorphi

Training session II

ISD Lab Training Session - II
Organized by
Department of Computing Technologies
Date: 04/08/2023
Participants
2nd year and 3rd year Students – Computing Technologies

Training Highlights

The Department of Computing Technologies organized a 2nd training session on 04 August 2023 at Intelligent System Design Lab TP1509 from 10.30 AM to 1.30 PM.

Mr. Thirumalazhagan, an **R&D Software Developer** from **SiGe Tech,** handled the session. He gave a detailed explanation of how to assemble the Mkr Wifi Robot car. The students were asked to assemble and code the wifi robot.

Mr.Sunil, a **Software Developer Trainee** from **SiGe Tech,** handled the next session. He gave a complete theoretical approach to ROS Basics.

Hands on & Training Session

Training session III

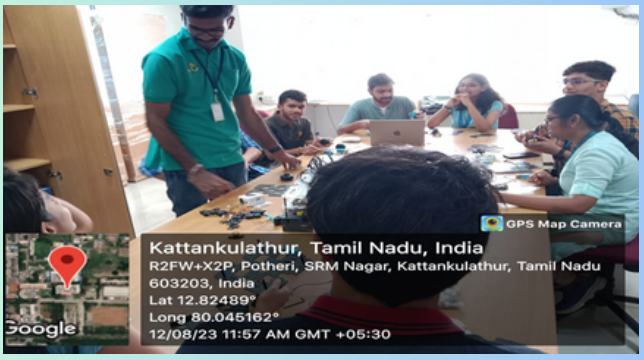
ISD Lab Training Session - III
Organized by
Department of Computing Technologies
Date: 12/08/2023
Participants
2nd year and 3rd year Students – Computing Technologies

Training Highlights

The Department of Computing Technologies organized a 3rd training session on 12 August 2023 at Intelligent System Design Lab TP1509 from 11.30 AM to 2.00 PM.

Mr. Thirumalazhagan, an **R&D Software Developer** from **SiGe Tech,** handled the session. He gave a detailed description of the components and their uses. He also gave hands-on training on assembling the Smorphi reconfigurable tiling robots and the DOFBOT robotic arm.

Mr.Sunil, a **Software Developer Trainee** from **SiGe Tech,** handled the next session. He gave a complete theoretical approach to ROS architecture.



Assembling - Smorphi

Training session IV

ISD Lab Training Session - IV
Organized by
Department of Computing Technologies
Date: 22/08/2023
Participants
2nd year and 3rd year Students – Computing Technologies

Training Highlights

The Department of Computing Technologies organized a 4th training session on 22 August 2023 at Intelligent System Design Lab TP1509 from 11.30 AM to 2.00 PM.

Mr.Sunil, a **Software Developer Trainee** from **SiGe Tech,** handled the session. He gave a detailed description of ROS and Ubuntu installation in Mini PC. He also explained how to use the 2D lidar to read data from the terminal and interpret the results.

2D Lidar Explanation

2D Lidar - Hands On

Workshop Robostim 1.0

ROBOSTIM 1.0 Workshop
Organized by
Department of Computing Technologies
Date: 09/11/2023
Participants
1st-year Students – Computing Technologies

Workshop Highlights

The Department of Computing Technologies organized a **ROBOSTIM Workshop** on 9th November 2023 at Intelligent System Design Lab TP1509, from 8.30 AM – 4.00 PM.

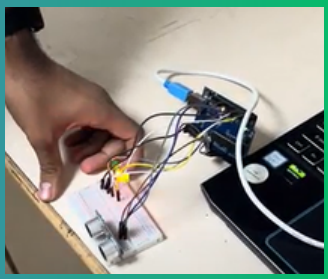
The workshop started with the **introductory session** given by **Dr. E. Poovammal, Professor, CTECH, SRMIST,** about the vision, objective, and purpose of the lab.

Mr. Thirumalazhagan from **SiGe Tech** handled the next session. He gave a detailed description of the components and their uses. He also gave hands-on training on assembling the reconfigurable tiling robots and the **DOFBOT robotic arm.**

Mr. Shivam Bansal and **Mr. Kavin Sundareswaran** (2nd year CTECH Student) handled the next session. Both of them are trained students who were working on the projects in the ISD lab. They taught **TINKER CAD,** a simulation tool to the 1st year students that is used to create a prototype before building the product in real-time. They have also displayed and explained the products which they have developed when working on the problem statements.

Finally, after the training on the TINKER CAD tool and on the various components, the students were divided into groups and were assigned small activities that they simulated using the TINKER CAD tool and then implemented in real time using the needed components.





Activities Given to Students


Hands On - DOFBOT

Workshop Robostim 2.0

ROBOSTIM 2.0 Workshop
Organized by
Department of Computing Technologies
Date: 20/11/2023
Participants
2nd-year Students – Computing Technologies

Workshop Highlights

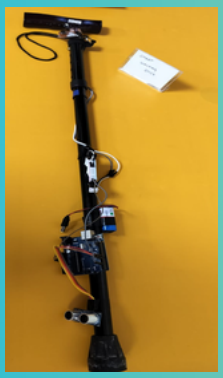
The Department of Computing Technologies organized a ROBOSTIM Workshop on 20 November 2023 at Intelligent System Design Lab TP1509 from 9.00 AM to 12.30 PM.

The workshop started with the **introductory session** given by **Dr. E. Poovammal, Professor, CTECH, SRMIST,** about the lab's vision, objective, and purpose.

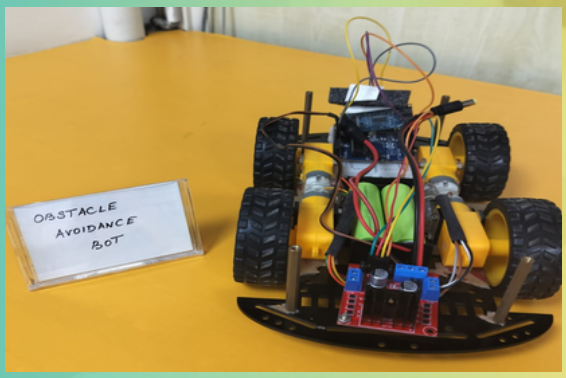
Mr. Shivam Bansal (2nd-year CTECH Student) handled the next session. He gave a detailed description of the components and their uses. He also gave hands-on training on assembling the reconfigurable tiling robots. He also gave a detailed demonstration and explanation of the projects that were going on in the ISD lab.

Training - Smorphi

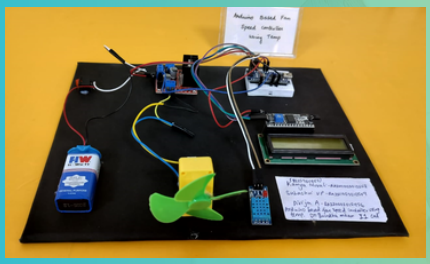
Projects



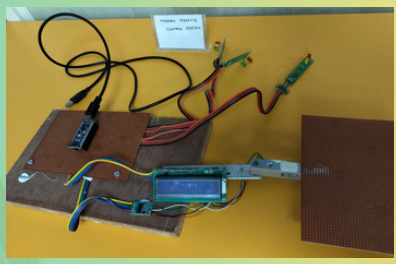
Smart Blind Walking Stick



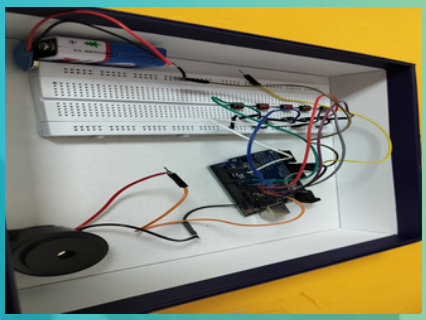
Obstacle Avoidance Bot



Smart Fan Controller

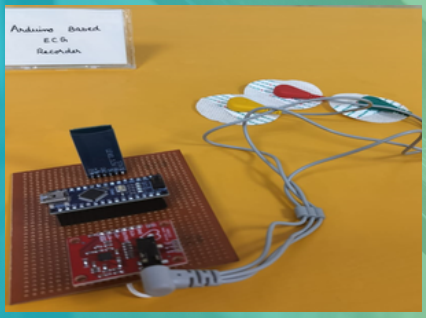


Modern Traffic Count System



Electric Piano

RFID Attendance Tracker



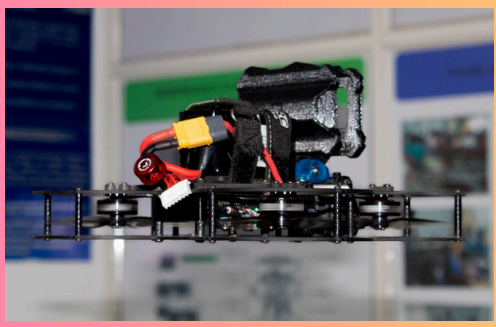
ECG Recorder

Project Status

ISD lab project details			
Sl No	**Particulars**	**Mentors**	**Status**
1	ClearPath: Obstacle Detection for Visually Impaired Individuals	Dr. B. Sowmiya	Completed
2	Sensory SafePath: Obstacle Detection for Deaf-Blind Individuals	Dr. B. Ida Seraphim	Completed
3	Autonomous Car with Obstacle Detection System	Dr. B. Sowmiya	Completed
4	Microprocessor based ECG Recorder	Dr. S. Padmini	Completed
5	Modeling of Real Life Traffic Control System	Dr. S. Padmini	Completed
6	Arduino Based ECG Recorder	Dr. R. Brindha	Completed
7	Arduino Based Fan Speed Controller Using Temp	Dr. R. Brindha	Completed
8	SkyNav: Autonomous Payload Drop & Waypoint Routing	Dr. B. Ida Seraphim	Completed
9	Simulating Modern Traffic Count System	Dr. R. Brindha	Completed
10	RFID Based Attendance System	Dr. S. Padmini	Ongoing
11	Radar System	Dr. S. Padmini	Ongoing
12	Smart Dustbin	Dr. S. Padmini	Ongoing
13	Pick and place with the arm robot mounted on the robot car.	Dr. B. Sowmiya	Ongoing
14	Thermal Pursuit: Uncovering the Temperature	Dr. B. Ida Seraphim	Ongoing
15	Automatic door opener	Dr. S. Padmini	Ongoing
16	Arduino Based Electric Piano	Dr. R. Brindha	Ongoing
17	Automatic Attendance Recorder Using RFID	Dr. R. Brindha	Ongoing
18	RFID Based Attendance System	Dr. Padmini	Ongoing

Drones

FPV 5inch, FPV Cinewhoop Drone, Payload delivery drone



FPV Cinewhoop Drone

Prof. Uday B. Desai, an Emeritus Professor from the Indian Institute of Technology Hyderabad, interacted with the ISD student team.

ISD team showcased their capstone projects to **Prof. Uday B. Desai** and got appreciation, encouragement, and valuable insights.

K.D.J Harsha Aadharsh and his team **won first place (Prize amt: 16K)** in **inline-of-sight flying with obstacles, drone race** hosted by **IIITDM, Kancheepuram, Chennai** on 16th March 2024.

The same team also **won third place (Prize amt:5k)** in the **model plane event** hosted by **IIITDM, Kancheepuram, Chennai** on 16th March 2024.

K.D.J Harsha Aadharsh and his team **won first place (Prize amt: 5K)** in **inline-of-sight flying with obstacles, drone race** hosted by **MIT, Chrompet, Chennai** on 17th March 2024.

Students Participation & Achievements

Medicine delivery robot

Rishit Tandon, Karan Diundi, and Ayush Pandey **first-year students** of **ISD special lab,** computing technologies department **won first place (Prize amt of 3K)** in a **project exhibition** conducted by IEI Chapter during **IEI Conclave** held on **13th March 2024.**

Project Exhibition
Drone Mapping and Surveillance for Rescue Missions

Poster Presentation
Utilization of Deep Learning Algorithms for Sustainable Computing

Poster Presentation
SafeWeave: A Digital Tapestry for Construction Site Safety and Efficiency

International Hackathon @ Singapore 23rd & 24th March 2024

SRM Institute of Science and Technology is elated to announce the triumphant success of our robotics team at the prestigious **RoboRoarZ Competition in Singapore.** Against a formidable field of **over 60 teams and 250+ participants from five nations,** our exceptional students have emerged victorious, securing both **first and second place titles!**

Team Cognit (1st Place)
- Rishit Tandon (C.Tech)
- Ankush Anand (EIE- Automation & Robotics)
- Maulik Dave (C.Tech)
- Arvind Sekhar (EIE- Automation & Robotics)
- Saurajyoti Bhattacharjee (C.Tech)

Team Autobots (2nd Place)
- Diptayan Jash (C.Tech)
- Siddhima Singh (DSBS- Big Data)
- Medhir Aryan (NWC- Cloud)
- Vinayak Soni (C.Tech)

Guest Visits

Prof. Uday Desai, Emeritus Professor

Prof. CR Muthukrishnan,
IIT Madras

Dr. S D Sudarsan, Executive
Director, CDAC Bangalore

Sh. P.Balasundar, Chief workshop
manager/ Carriage & Wagon works

Mr. Shankar Venugopal,
Mahindra Research Valley, Chennai

Dr. Bernaurdshaw Neppolian
Dean Research, SRMIST

Mr. Kotteeswaran and Mr. Purushothaman Ramakrishnan,
technical lead from RISELAB, IIT Madras

Thank you for being the essential element in our lab of discovery