



“This is Computer age next will be Robotic era”

WORKSHOP ON “X-MICE” MICROMOUSE ROBOT

IEEE conceptualizes their own unique module in Robotics i.e. Micromouse. For which ThinkWare has designed their own Micromouse Robot kit for which provide students a good platform to learn the concept of autonomous Robots & Artificial Intelligence.

ThinkWare: Technology & Innovation Kiosk

Shepherding-Intelligent-Tomorrow

ThinkWare is a venture which deals in the domain of Robotics, Embedded Systems & MATLAB with strategically current focus in educational domain to bridge the gap between Industry demands & current academics offerings in Institutes. With a passion in Robotics and keeping constant eye on various national & international events, we have vast experience in the same and a constant focus in this grooming industry. **ThinkWare** was founded by a strong team of young Engineers & budding Entrepreneurs working in the same industry, and is currently incubated at STEP-ITBI, JSSATE Noida. The company is properly backed by the experienced academicians and Industries.

X-Mice “xpert in Micromouse Robot”

X-Mice is the workshop on how to make Micromouse reach center of the maze for which Thinkware has developed their own Micromouse kit.

The Micromouse competition challenges the participants to design a completely autonomous, self contained, maze solving robot which is required to reach the center of an unknown maze, starting from a pre-specified corner. It has sensors to ‘see’ the walls, motors as actuators and batteries to provide onboard power. Micromouse also has an onboard microcontroller to take readings from the sensors, drive the motors and compute the high level maze solving algorithms. The problem is highly interdisciplinary in nature and tests the mechanical, electronic and programming competency of the individual/group which designs it.

The maze is made up of a 16 by 16 grid of cells, each 180 mm square with walls 50 mm high. The mice are completely autonomous robots that must find their way from a predetermined starting position to the central area of the maze unaided. The mouse will need to keep track of where it is, discover walls as it explores, map out the maze and detect when it has reached the goal. Having reached the goal, the mouse will typically perform additional searches of the maze until it has found an optimal route from the start to the center. Once the optimal route has been found, the mouse will run that route in the shortest possible time.

Application of Micromouse:

- Micromouse is a miniature form of autonomous robot finding its path in difficult terrains and battle fields. It can be implemented in making the vehicles autonomous, DARPA Challenge in US challenges engineers to make autonomous vehicles which can cross through the hurdles placed in their way.
- The algorithm is used in telecom sector for path routing.
- The motor driving concept used is the basic concept involved in the Industrial drives.
- Interrupt based programming used in Micromouse forms the core of all other real time operating systems.
- Sensors used are of the same kind that is used in consumer based goods, automatic doors, lifts, etc.

Our Esteemed Advisory Board:

1. **Dr. Y.N. Singh**
Associate Professor IIT Kanpur
Chairman-IEEE, U.P. Region
2. **Dr. B.P. Singh**
Retd. Professor MMM Gorakhpur
Senior Member-IEEE

3. **Prof. Dinesh Chandra**
HOD-ECE, JSSATE Noida.

Features of Workshop:

- Take away Robot kit worth Rs. 5000/- will be given to each team of 4 students.
- Certificate of participation will be given to each participant.
- Free 30 days 8051 e-learning course on Thinkware.com worth Rs. 1500/-
- Free access to INDIA's best Robotics forum "RoBoFreaks" at Thinkware where student's can publish their projects & will be acknowledged.
- Study material & Thinkware CD will be given to each student.
- Lifetime membership account on www.thinkware.com to avail all discounts in future.

Workshop Course content:

The concepts that will be covered are:

- Introduction
 - History
 - Parts of a Micromouse
 - Investigation of the Mechanics Involved
- Introduction to Thinkware Micromouse kit
- Introduction to ATmega 32
 - AVR Architecture
 - I/O Ports

Hands-on session will include:

- Introduction to the Software tool chain related with AVR (AVR Studio 4/WINAVR)
- Basic Interfacing
 - LED
 - Switch
 - 16x2 LCD
 - Stepper Motor
- Basic movements
 - Moving straight one cell at a time
 - Left turn
 - Right turn
 - 180° turn
- Advance AVR Topics
 - Concept of Interrupts
- Advance AVR Topics:

- Timers
- Interrupts using Timer
- ADC
- Interrupt using ADC
- Using ADC to interface with the IR sensors
- Running Stepper Motors using timed Interrupts
- Making the mouse go straight in the maze
- Wall Detection
- Wall following algorithm
- Discussion of flood fill algorithm
- Running of Micromouse in the maze
- Miscellaneous topics

Course Duration:

- The workshop will be of 3 days (20 hours)

Requirements from college:

- Infrastructure as computer lab, one computer will be shared among 4 students.
- LCD Projector for the lecture.
- Lodging & Boarding facility for the trainer during workshop.
- Minimum participation of 60 students.

Note:

- Micromouse is one of the best product of ThinkWare.
- This year we are lead associates in Micromouse with ISM Dhanbad & BITS Pilani to organize Micromouse competition. Lodging & Boarding facility for the trainer during workshop.

Contact:

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