TS
TECH TEACH
EDUCATIONAL SOLUTIO

ROBOTICS

OUR MISSION :

"Our mission is to empower learners worldwide through innovative technology, personalized learning experiences, and accessible educational resources. We strive to cultivate a community where every individual can achieve their full potential, regardless of their background or circumstances."

OUR VALUES :

"To pioneer the future of education by leveraging cutting-edge technology to make learning more engaging, effective, and inclusive. We envision a world where education transcends boundaries, creating opportunities for lifelong learning and fostering a society enriched by knowledge and creativity."

COURSE CURRICULUM:

Week 1: Robotics Fundamentals Review

- Day 1-2: Introduction to Robotics
  - Overview of robotics, key concepts, and applications.
  - Review of kinematics, dynamics, and control systems.
- Day 3-4: Robot Operating System (ROS) Basics
  - Introduction to ROS and its architecture.
  - Setting up a ROS environment.
- Day 5: ROS Nodes and Topics
  - Understanding ROS nodes, topics, and messages.
  - Hands-on: Creating and managing ROS nodes.

COURSE CURRICULUM:

Week 2: Advanced Kinematics and Dynamics

- Day 1-2: Advanced Kinematics
  - Forward and inverse kinematics for complex robots.
  - Hands-on: Implementing kinematic models.
- Day 3-4: Advanced Dynamics
  - Dynamics of robotic systems and multi-body dynamics.
  - Hands-on: Simulating robot dynamics.
- Day 5: Path Planning and Trajectory Generation
  - Path planning algorithms (A*, RRT, etc.).
  - Hands-on: Implementing path planning in ROS.

COURSE CURRICULUM:

Week 3: Robot Perception

- Day 1-2: Sensor Integration
  - Types of sensors used in robotics (LIDAR, cameras, IMUs, etc.).
  - Integrating sensors with ROS.
- Day 3-4: Computer Vision
  - Introduction to computer vision in robotics.
  - Hands-on: Using OpenCV with ROS.
- Day 5: 3D Perception
  - 3D perception techniques and point cloud processing.
  - Hands-on: Implementing 3D perception in ROS.

COURSE CURRICULUM:

Week 4: Machine Learning for Robotics

- Day 1-2: Introduction to Machine Learning
  - Overview of machine learning concepts and algorithms.
  - Applications of machine learning in robotics.
- Day 3-4: Deep Learning
  - Introduction to deep learning and neural networks.
  - Hands-on: Implementing deep learning models for robotics.
- Day 5: Reinforcement Learning
  - Basics of reinforcement learning.
  - Hands-on: Implementing reinforcement learning for robotic control.

COURSE CURRICULUM:

Week 5: Advanced Control Systems

- Day 1-2: Nonlinear Control
  - Nonlinear control techniques for robotics.
  - Hands-on: Implementing nonlinear control systems.
- Day 3-4: Adaptive Control
  - Introduction to adaptive control.
  - Hands-on: Implementing adaptive control in ROS.
- Day 5: Optimal Control
  - Principles of optimal control and model predictive control (MPC).
  - Hands-on: Implementing MPC for robotic systems.

COURSE CURRICULUM:

Week 6: Multi-Robot Systems

- Day 1-2: Introduction to Multi-Robot Systems
  - Concepts and applications of multi-robot systems.
  - Coordination and communication in multi-robot systems.
- Day 3-4: Swarm Robotics
  - Principles of swarm robotics and algorithms.
  - Hands-on: Implementing swarm robotics in ROS.
- Day 5: Distributed Control
  - Distributed control techniques for multi-robot systems.
  - Hands-on: Implementing distributed control in ROS.

COURSE CURRICULUM:

Week 7: Human-Robot Interaction (HRI)

- Day 1-2: Introduction to HRI
  - Principles and challenges of human-robot interaction.
  - Types of HRI and applications.
- Day 3-4: Gesture and Voice Recognition
  - Implementing gesture and voice recognition for HRI.
  - Hands-on: Using machine learning for HRI.
- Day 5: Safety and Ethics in Robotics
  - Safety considerations in robotics.
  - Ethical implications and guidelines for robotic systems.

COURSE CURRICULUM:

Week 8: Final Project and Presentations

- Day 1-4: Project Development
  - Students work on a comprehensive final project that integrates multiple aspects of the curriculum.
- Day 5: Project Presentation and Evaluation
  - Students present their projects.
  - Feedback and evaluation.

Our Partners Company's

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THANK YOU

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