FIVE-DAY FACULTY DEVELOPMENT PROGRAMME ON

ROBOTICS & AI

June 24-28, 2019

Conducted across India under

National Knowledge Network

An initiative of Ministry of Electronics & IT, Government of India

IIT Guwahati | IIITDM Jabalpur | MNIT Jaipur | NIT Patna | IIT Roorkee | NIT Warangal

Hosted in Bengaluru by

Dayananda Sagar University

Hosur Road, Kudlu Gate,Bengaluru – 560068

COURSE VENUE AND HOW TO REACH

The Programme will be conducted at Dayananda Sagar University Innovation Campus, Kudlu Gate, Bengaluru. The campus is located close to the Kudlu Gate Bus Stop on the Hosur Road between Silk Board .and Electronic City.

LEADING SPEAKERS

Prof. S.K. Saha, IIT Delhi
Prof. Kurien K. Issac, IIST, Thiruvananthapuram
Prof. A. Dutta, IIT Kanpur
Prof. A. Ojha, IIITDM Jabalpur
Prof. R.B.V Subrahmanyam, NIT Warangal
Dr. P.K. Padhy, IIITDM Jabalpur
Prof. V.K. Gupta, IIITDM Jabalpur

COURSE COORDINATOR

(DSU Bengaluru)

Dr P Vivekananda Shanmuganathan
Professor of Mechanical Engineering
School of Engineering
Dayananda Sagar University,
Kudlu Gate, Bengaluru - 560068
Email: viveks-me@dsu.edu.in
Phone: 9486062923

ABOUT THE COURSE

A five-day Faculty Development Programme on ROBOTICS AND AI is being planned at DSU during June 24-28, 2019. This programme is sponsored by Ministry of Electronics and IT, Government of India, and coordinated by IIIT Jabalpur and NIT Warangal. *Dayananda Sagar University will be hosting the programme as a nodal centre.*

Forenoon Sessions: Lectures over video conferencing + online interaction
Afternoon Sessions: Practical sessions at Dayananda Sagar University

ELIGIBILITY

Faculty members and PhD scholars of any recognised universities and colleges will be eligible to attend the programme.

Registration Fee: NIL for faculty members and PhD students. A refundable security deposit in the form of Demand Draft for Rs 1000/- (Rupees One Thousand Only) must be submitted, which will be returned at the end of the programme.

Registration Fee: Rs 3,000/- For all other category of delegates

No travelling allowance will be available. Delegates must make their own arrangements for accommodation. Lunch will be provided to all delegates.

COURSE CONTENT

1. Introduction to Robotics and Robot Simulators Robot Manipulators, Mobile Robots, Legged Robot, Aerial Robots, Applications. Components and mechanisms of a robotic system, sensors and actuators. Introduction to Manipulator, Coordinate System, classification, reachable and dexterous space, Forward and Inverse kinematics, DH Parameter Velocity Kinematics.

   Hands on: Robot Simulation Software, Tutorials on Coordinate systems and Robot Kinematics: Webots, RoboAnalyzer

2. Kinematics, Dynamics and Control Mobile robots and their kinematics, Holonomic and Non-holonomic robots. Basics of trajectory planning, configuration space and dimension. Linear and nonlinear robot control: Feedback and motion control, Path Planning and Obstacle Avoidance in known and unknown environment. Intelligence path planning.
   Hands on: Practice on Webots for Trajectory Planning using different types of robots

3. Artificial Intelligence and Robotics Introduction to Artificial Intelligence and Machine Learning. Artificial Neural Networks and Fuzzy logic. Vision based planning and control, Learning based motion planning

   Hands on: Implementation of ANN and Fuzzy logic for motion planning and simulation, Hardware implementation using Raspberry Pi boards.

4. More on AI and Machine Learning: Reinforcement Learning: Introduction to Reinforcement Learning, Tabular Solution Methods – Multi-armed Bandits, Finite Markov Decision Processes, Dynamic Programming, Monte Carlo Methods, Temporal Difference Learning.

5. Applications, Research Directions and Case Studies: Research directions, and case studies. Mobile robotics – multi-terrain robots, humanoid robots. Biped locomotion; Applications in Agriculture, and Social robotics. Brain Computer Interface (BCI) and gesture control

   Hands on: Simulation of robot tasks and motion planning, Industrial manipulators and motion planning and hardware implementation.

APPLICATION FORM FOR FDP ON ROBOTICS & AI

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Scanned copy of this form must be emailed to viveks-me@dsu.edu.in
Physical copy may be sent by post or submitted in person to the coordinator.

Passport Size Photograph of the Applicant

Name of the Applicant:
(In Block Letters) _____

Father's Name: _____

Designation: _____

Category of the applicant: Faculty / Industry Professional / PhD Student / Other _____

Name of the Institution: _____

Address for Communication (Offcial): _____

_____

_____

_____

Mobile Phone No. _____ Email: _____

Gender: Male / Female Age: ___ years Date of Birth: __ / __ /____

Aadhar Card No. _____

Highest Educational Qualification: _____ in the Specialization _____

DECLARATION

The information provided above is true to the best of my knowledge and belief.

_____

Signature of the Applicant (with date)

Forwarded by Head of the Institution

Signature **Seal of the Institution**