



SPOT LIGHT ROBOTICS

RISE OF THE MACHINES

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ROBOTICS IS A popular subject in India and abroad. Students from school, college and university, get excited about the subject when they hear about it. As for industry, robots are widely used in automobile sectors.

Besides, it finds applications in space, sea, security, medical, among others. In India, robotics is an emerging area as India is one of the fastest growing countries in the automobile sector. As a result, the field of robotics, be it programming, maintenance or component supply, has to grow fast.

From a student's perspective, there is a

bright future for those who study robotics. In India, the jobs are increasing mainly due to the use of robot in large numbers by auto sectors. These robots need new programming when a different manufacturing or assembly plan is introduced due to the launching of new car models. Also, some additional attachments may have to be designed and integrated within an existing robot to enhance the robot's capability to increase productivity/quality and reduce its price.

Additionally, sectors such as defence and space are also looking for robotic specialists, as the government is initiating

more new activities.

For example, the *Chandrayaan* project by Indian Space Research Organisation (Isro) required several robotic specialists to design and control many autonomous systems. Besides, many virtual reality environments like flight simulators used to train pilots, and those used to train the drivers of a car, truck or motorcycle require robotics technology.

In fact, robotics knowledge also helps in automation integration and control of any factory set-up. As a result, even if a company does not use robots, it does not mean that robotics experts are not required.

Almost all engineering colleges and institutes in mechanical, electrical, computer science, IT or similar specialisations offer courses on robotics at the undergraduate level to prepare students for industry and to prepare them for higher studies in the same specialisation. Even though there are few specialised MTech courses on robotics in the country, the course is taught in several levels at IITs and IISc for Master's and doctoral students.

Besides, students at these institutes carry out research in this area during their BTech/MTech projects and MS/PhD thesis work.

AT A GLANCE

- ▲ We need to move towards an inter-disciplinary approach. All cutting edge developments in technologies occur at the interface of two or more disciplines.
- ▲ Of special interdisciplinary interest to technical education in recent years has been developments in areas such as mechatronics, robotics, biomedical engineering, mobile computing, multimedia applications, and so on.
- ▲ A large number of institutions in India, originally established for specialised programmes of research, are now moving towards areas of interdisciplinary research and training.
- ▲ The higher technological institutions have a responsibility to proactively engage the industry in provoking their interest in interdisciplinary research.

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>> REALITY BYTES

The future of robotics worldwide looks good following a slowdown period in the West during the mid-and late-'90s. Robots or robotic technology is finding new areas of applications including haptics, micro-nano-bioengineering, and so on, where precision is of utmost importance. Haptic, for example, is the technology where virtual environments can be created. As a doctor, one can get the feel of surgery even without doing any real surgery. Using a haptic device, the skill of doctors can be substantially enhanced before he or she performs a real surgery, thus, reducing the risk of life.

These cutting-edge technologies require a substantial and combined knowledge of physics, chemistry, biology and engineering. Hence, highly educated (MS/PhD) researchers are required to carry out research for production of such items and use them.

Responding to the times, institutes worldwide — including the IITs, IISc, AIIMS and several others in India — are gearing up to provide more specialised Master's and PhD programmes in these areas.

In 2008, AIIMS joined hands with the IITs and Stanford University, US, for medical innovations. Under this programme, MBBS doctors and engineering faculty from IITs are studying each other's subjects so that they can carry out research in multi-disciplinary areas.