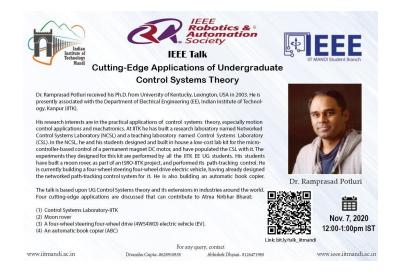# IEEE Robotics and Automation

IEEE talk on "Cutting Edge Applications of undergraduate control"

Event description

IEEE RAS Student branch chapter,IIT Mandi organised an online talk on "cutting edge applications of undergraduate control" on 7th November 2020. The talk was delivered by Dr. Ramprasad Potluri, associate professor at IIT Kanpur. The talk began around 12 pm(IST) and lasted for 2 hrs with Q & A in between the talk.
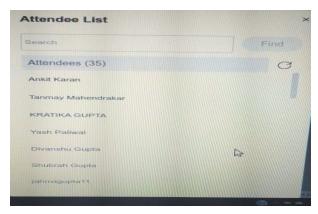
About the speaker

Dr. Ramprasad Potluri is with the Department of Electrical Engineering (EE), Indian Institute of Technology, Kanpur (IITK). His research interests are in the practical applications of control systems theory, especially motion control applications and mechatronics. At IITK he has built a research laboratory named Networked Control Systems Laboratory (NCSL) and a teaching laboratory named Control Systems Laboratory (CSL). In the NCSL, he and his students designed and built in house a low-cost lab kit for the microcontroller-based control of a permanent magnet DC motor, and have populated the CSL with it. The

experiments they designed for this kit are performed by all the IITK EE UG students. His students have built a moon rover, as part of an ISRO-IITK project, and performed its path-tracking control. He is currently building a four-wheel steering four-wheel drive electric vehicle, having already designed the networked path-tracking control system for it. He is also building an automatic book copier.

Participation and activity involvement:

Around 35 students attended the talk virtually through CISCO webex platform. All the questions of attendees were well answered within the duration of the talk.

List of some attendees of talk

Main highlights of the talk:

Following subtopics were discussed and explained in brief

- **Moon rover** : A moon rover is an all-terrain articulated rover. Its motion along a desired path on uneven terrain has been demonstrated by only a handful of works, none of which use kinematics-based Methods. Their work at IITK successfully demonstrated the path-tracking control of moon rover using kinematic-based methods. These methods work with fewer sensors in comparison to the existing dynamics-based methods, and can nicely provide redundancy in the control of the moon rover.

- **CSL and NCSL** : Control Systems Laboratory and its experiments that have already run 10 years continuously at IITK, built at less than a

tenth of the cost of commercially-available experimental setups, incurred less than Rs. 1 lakh maintenance cost over 10 years, and which provide proven experience in controls and mechatronics to the students.

- **Automatic book copier**: An automatic book copier (ABC) has a page-separation-lifting-turning mechanism that is guided by a control system, a page-flattening mechanism that is guided by a second control system, a cradle translating mechanism that is guided by a third control system, and one supervisory control system that coordinates these three with page copying.

Thanking the guest speaker

The speaker was gifted with a traditional shawl and cap of Himachal pradesh as an honour for delivering the valuable talk to IIT Mandi students.