



KNOWLEDGE INCUBATION FOR TEQIP  
IIT KANPUR

---

## TEQIP Summer Training in Robotics

May 15 to July 15, 2017

---

**Summer Training Program 2017 in ‘Robotics’** was organized by KIT in association with **Center of Mechatronics, IIT Kanpur**. This was 2 month summer training program for **UG students**. 4 students were selected for this training program. In the first week they were given the common lectures on the research topics of the Robotics and made aware of few of the research work done at the centre. After the lectures, for the rest of their training period, they were asked to work on topics given to them according to their field of interest.

They were also encouraged to join the **third international conference held in IIT Delhi on ‘Advances in Robotics’** during June 28 – July 2, 2017 organized by The Robotics Society. By attending this conference they were made aware of the state of the research in the field of Robotics. They all joined for this conference and actively participated in the sessions.

### **Topics covered during the training:**

- Biped locomotion
- Motion planning
- Mobile robotics
- Design
- Control of robotic systems, vision, etc.

## ORGANIZERS

1. **Dr. Anjali V. Kulkarni**

Principal Research Engineer  
Center for Mechatronics  
IIT Kanpur

<http://home.iitk.ac.in/~anjalik/>



2. **Dr. Ashish Dutta**

Professor  
Dept. of Mechanical Engineering  
IIT Kanpur

<http://home.iitk.ac.in/~adutta/>



### List of Students

Name		Institute	
1	Mr. Dilghas Ommer	B. Tech., Electronics and Instrumentation	College of Engineering, Kidangoor
2	Mr. Monal Gedam	B. Tech., Mechanical Engineering	Visvesvaraya National Institute of Technology, Nagpur
3	Mr. Aaromal Prasad	B. Tech, Electronics and Instrumentation	College of Engineering, Kidangoor
4	Mr. Dinesh Kumar Kaliki	B. Tech., Mechanical Engineering	Visvesvaraya National Institute of Technology, Nagpur

## Organizers Report

### **Report on TEQIP Summer Training in Robotics**

**(May 15 – July 15, 2017)**

**Dr. Ashish Dutta, Professor, ME Department, IIT Kanpur**

**Dr. Anjali V. Kulkarni, PRE, Centre for Mechatronics, IIT Kanpur**

A two months summer training program was carried out with the support of TEQIP IIT Kanpur. From around 25 applications of third year B. Tech. students, five candidates were selected based on their ranking (till third year) and interest of working in Robotics fields of research topics. Four candidates namely: Mr. Dilghas, Mr. Gedam, Mr. Aaromal Prasad and Mr. Dinesh Kumar Kaliki joined for the training. For the first week starting May 15, 2017, they were given the common lectures on the research topics of the Robotics and made aware of few of the research work done in the centre. After having gone through these lectures, they were asked to come up with their areas of interest to work with. Accordingly they selected the topics and started working on it.

They were also encouraged to join the third international conference held in IIT Delhi on ‘Advances in Robotics’ during June 28 – July 2, 2017 organized by The Robotics Society. By attending this conference they were made aware of the state of the research in the field of Robotics. They all joined for this conference and actively participated in the sessions.

At the end of the training program, TEQIP IIT Kanpur presented them the certificates.

The topics on which they carried out their work are summarized below.

**1. Mr. Dilghas Ommer** (Bachelor of Technology, Electronics and Instrumentation, College of Engineering, Kidangoor)

He worked on Kinect based 3 finger grasping mechanism. The objective is to take input data from Kinect vision system and to plan the kinematics for 3 finger hand to grasp objects with the ultimate objective to integrate this mechanism to ‘Waste management robot’ studied by Mr. Kaliki Dinesh Kumar.

**2. Mr. Aaromal Prasad** (Bachelor of Technology, Electronics and Instrumentation, College of Engineering, Kidangoor)

He worked on the ‘ATHLETE rover with four legs’ design having less degree of freedom and a motion like a dog while walking. While working on this, he got exposed to: Introduction to robotics, study of different joints, study of dh

parameters, calculation of dh parameters, study of transformation matrix, how to use MATLAB for gait planning of dog motion, etc.

**3. Mr. Kaliki Dinesh Kumar** (Bachelor of Technology, Mechanical Engineering, Visvesvaraya National Institute of Technology, Nagpur)

He worked on the 'Waste Management Robot (WMR)' challenge posed by TCS. He presented a preliminary report in the ppt file giving the details of: Necessity of WMR in India, Challenges/Objectives, Robot Locomotion, Robotic Arm, Robot Vision System, Results and Conclusion and Challenges to be answered with references.

He also gave his observations noted during the workshop conducted by TCS on 'Waste Management Robot' at AIR 2017 international conference held at IIT Delhi.

**4. Mr. Monal Gedam,** (Bachelor of Technology, Mechanical Engineering, Visvesvaraya National Institute of Technology, Nagpur)

He studied the classification, types and walking biomechanics of biped robots. He also studied the kinematic (forward and inverse) transformations of 10 dof biped robot and performed MATLAB simulation of walking and stair climbing. He did the elementary study of Kinect vision system for visual feedback.