

# ANNUAL CONVENTION 2016 ENGINEERING EXCELLENCE AWARDS



*Indian National Academy  
of Engineering*

**INNOVATIVE STUDENT  
PROJECTS AWARD 2016**

# INNOVATIVE STUDENT PROJECTS AWARDEES 2016

## BACHELOR'S LEVEL

(1)



Mr Gaurav Mittal



Mr Kaushal Yagnik



Mr Mohit Garg

**Engineering College/Institution:** Indian Institute of Technology Ropar

**Title of the Project:** SpotGarbage: Smartphone App to Detect Garbage Using Deep Learning

**Summary of project:** The city landscape of nations such as India is witnessing street corners and pavements transforming into garbage dumps. With the aim of engaging citizens to track and report this menace, this project presents a novel smartphone app, SpotGarbage, which ventures into deep learning and computer vision to automatically detect and coarsely segment garbage regions in a user-clicked geo-tagged image. The app utilizes the proposed deep architecture of fully convolutional neural networks for detecting garbage in images. The model has been trained on a newly introduced Garbage In Images (GINI) dataset, achieving a mean accuracy of 87.69%. Many optimizations have been proposed in the network architecture resulting in a reduction of 87.9% in memory usage and 96.8% in prediction time with no loss in accuracy, facilitating its usage in resource constrained smartphones and other IoT devices.

SpotGarbage performs the prediction on the smartphone itself making it unnecessary to upload images over internet, thus saving on premium network bandwidth. The images, when clicked, are geo-tagged allowing the authorities to know where exactly the garbage is present. The app also provides an offline cache to store the predictions to be uploaded at a later time considering the sparse network connectivity outdoors. Further, it respects user's privacy by collecting no personal information and requires minimal permissions to operate.

(3)



**Ms Chiluka  
Soniya**



**Mr Dandu  
Mukul Sri**



**Ms Ravula  
Rikitha**



**Mr Vadicherla  
Jaydev Kumar**

**Engineering College/Institution:** Mahatma Gandhi Institute of Technology, Hyderabad

**Title of the Project:** Design and Development of Prototype of An Android Based Agricultural Robot With Motorized Shovel Control System and Automatic Seed Dispensing System.

**Summary of project:** The major components of the fabricated agricultural robot are as follows:

- a. SHOVEL: It can be moved upward and downward with the help of a dc geared motor by clicking on the options UPWARD OR DOWNWARD in the android application.
- b. SEED DISPENSER: Once the shoveling operation is started, the seed dispenser is rotated to sow the seeds; the seeds are dropped from the perforated cylinder. The seed dispenser starts rotating by clicking the option DISPENSING ON and is put off by clicking the option DISPENSING OFF.
- c. WATER SPRINKLER: After dispensing the seeds the field has to be watered. This operation is achieved by using a suction pump fitted at back of the water tank; sprinkler is on by clicking on the option SPRINKLER ON and is put off by clicking on the option SPRINKLER OFF.

It is an Embedded System. The functions of the developed model can be operated by using an Android mobile with the help of specially developed application. A Bluetooth module is used as an interface between the bot and the android mobile. The bot can also be integrated with RC for easy control and feasibility.







