Innovative Projects Done by NIELIT Students

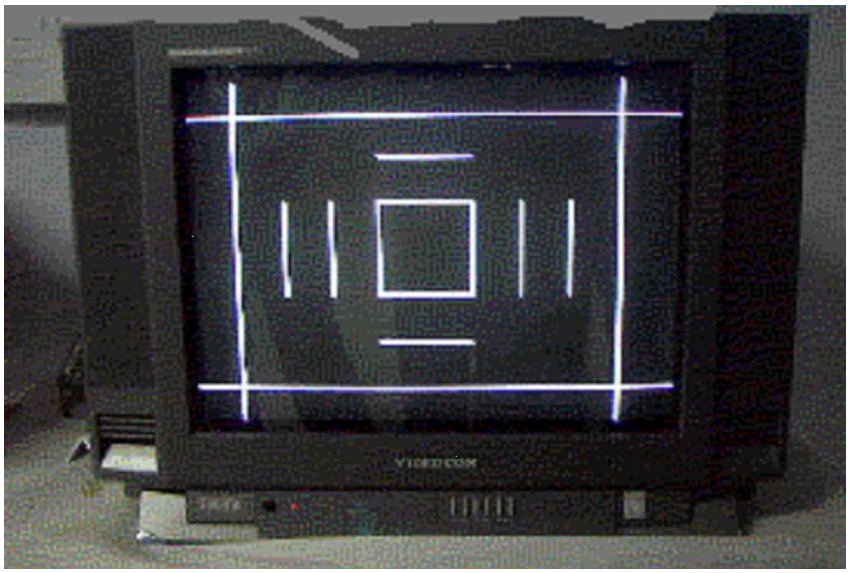
At NIELIT Aurangabad, Students transform their innovative ideas into projects using cutting edge technologies like Embedded/Microcontroller, PIC, Arduino, Atmel, Atmega, IoT, Matlab, VLSI, DSP, Single Board Computer, Embedded Linux (Raspberry Pi), Android etc. based on Industry requirements and societal issues . Some of the innovative projects are listed below

DEVELOPMENT OF AUTOMATIC TV RASTER GEOMETRY CORRECTION SYSTEM FOR VIDEOCON INDUSTRIES LIMITED

by KALPANA BORADE, RAKHI KHARAT

In the TV industry before the actual TV is assembled the raster of the picture tube needs to be corrected. There was a need to reduce the time required for correction of raster.

By using camera and frame grabber software the image of raster in the picture tube is being captured, Then this image is compared with the standard dimensions of the raster stored in memory and raster is get corrected accordingly.



Features:

- Reduce the overall time in the raster geometry correction process.
- Collaboration of more than one platform for software development.
- Developed the software with the worst case time for Geometry Correction is 12 seconds and minimum time required is 8 second.
- Improvement in the production line efficiency.
- Installed and it is in working condition in the leading TV industry

FPGA BASED AUTORICKSHAW FAREMETER

by Ms. ASHWINI A. REDEKAR

This System calculates & prints Fare and Distance travelled by Passenger as well as the total distance travelled by the Rickshaw. Selection and mounting of sensors is done to make it tamper proof. It gives very accurate readings as the chip computes the distance using a very high frequency

clock signal digitally in place of the old fare meter which used to calculate the fare based on the rotations of the wheel of the vehicle. It uses an FPGA chip to take care of field programmability in case of changes in tariff rates by RTO.

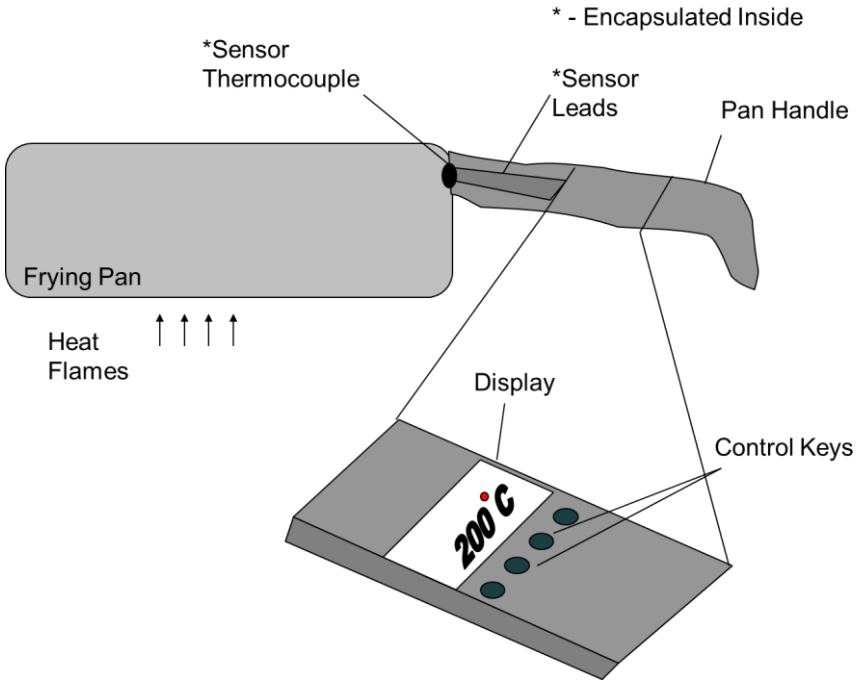
FPGA BASED ELECTRONIC COOKWARE

for NIRLEP COOKWARE IND. LTD

by A.V.R.KRISHNA, MANOJ REWATKAR

The requisite of this FPGA based Electronic Cookware is to check the Maximum temperature attained by a pan in its lifetime and overall cooking time of the pan above 250^{o}C other than the usual feature of a cookware,so that the spoilage of the pan can be prevented.

This system measures and displays the temperature of pan and has the facility to preset the temperature settings for a variety of recipes. It gives an alarm indication if pan temperature reaches the set temperature. It also counts cooking cycles and cooking time and has the provision to send the data to a PC over RS232 port.



AUTOMATIC CONTROL OF IRRIGATION-CUM-FERTIGATON SYSTEM

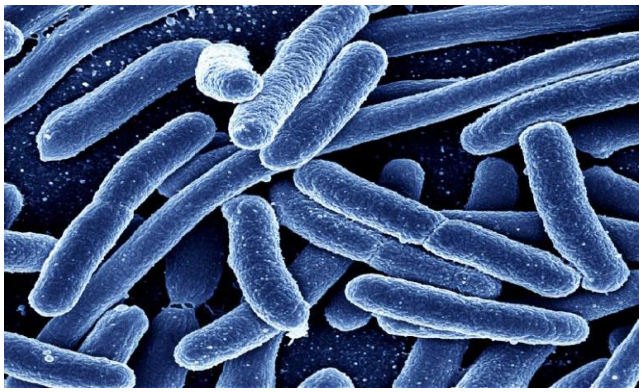
by ATUL KADTAN, NITESH NIKAM, VINAYAK SABLE

Automatic control of irrigation-cum-fertigation system leads to optimum utilization of water and fertilizer. The system is installed in the Lawn of NIELIT Centre, Aurangabad. This is a real time irrigation system which senses the actual soil moisture & accordingly irrigates the land. It uses time based cycle for fertigation i.e to use the liquid fertilisers (N: P: K).

BACTERIA COUNTING IN E.COLI CULTURE USING IMAGE PROCESSING

by KAUSTUBH JOSHI, SUMIT WANKHADE, ATUL MANE

This project was the requirement of a research lab in Aurangabad where E.coli Bacteria were being counted using conventional microscope with naked eye. The bacteria size [2-10 um (height) & 0.5-1.0 um (breadth)] is very small & the bacteria are fast moving hence counting is difficult & error prone with naked eye.



Counting of Bacteria in E.coli culture was automated using image processing.

High magnification factor microscope with film roll camera fitting arrangement is used to acquire the picture

The picture is then converted to Digital Image using scanner.

Deliverable of project is to

1) Give the Bacteria count
2) Classify Bacteria based on stages of growth as
    a) Mother bacteria
    b) Baby bacteria

ELECTRONIC RAISIN SORTER

by SUNDAR MHASKE, PADMAKUMAR KAMBLE, MAHESH ZAGDE

Raisin sorting done manually increases labor cost, time and is less accurate. Electronic raisin sorter is a machine vision system that sorts raisins automatically according to color (4 major colors). Webcam is used to capture images of raisins. These images are processed using MATLAB tool to sort raisins according to their colors.

Features:

- Provides better quality
- Uniformity in color
- Continuous operation
- Increase in production

Machine Vision System

X- RAY IMAGE PROCESSING FOR NON- DESTRUCTIVE DETECTION OF SPONGY TISSUE IN ALPHANSO MANGO by SAGAR LAKDE, PRAVIN GADE, ANSHUL MISHRA

System detects the presence of defect inside the raw mango in a Non – Destructive and Non – contact manner. Soft x-ray is used to capture image of mango. Image processing is used to study the internal details of raw mango and identify defects or faults if any. Thus grading the mangoes according to quality is achieved.

- Quality based pricing
- Encourage the farmer / retailer for sorting and grading mangoes.
- Increase in export

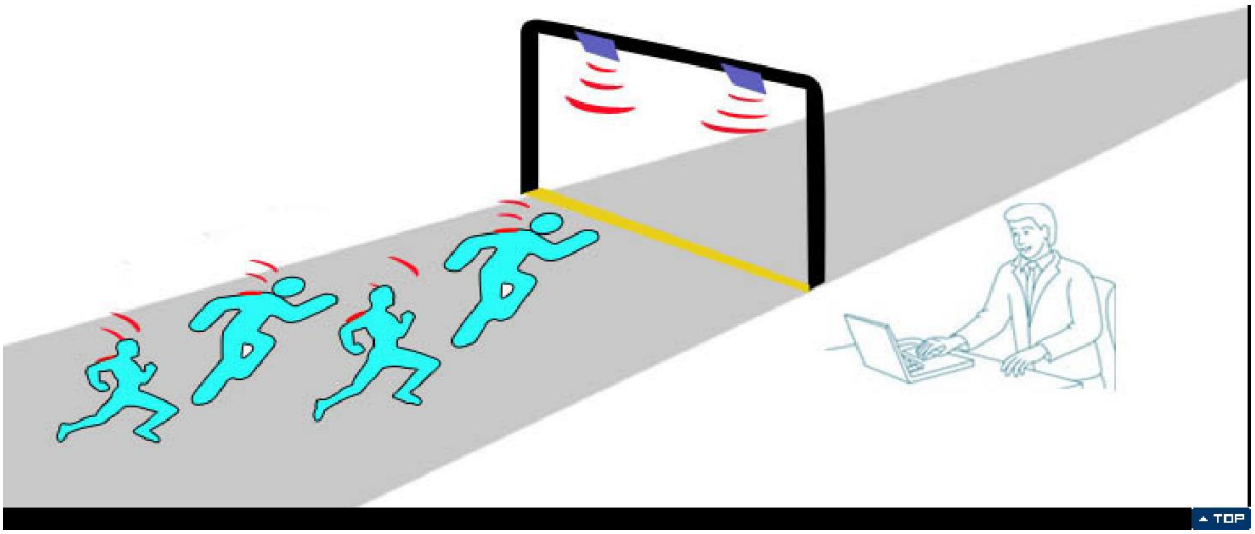
X-Ray image of a non-defective Alphanso Mango

X-Ray image of Alphanso mango having Spongy tissue

RFID BASED MARATHON TRACKING SYSTEM

by SHARAD KAKDE, KRISHNA PATIL, GAURAW BHALEKAR

This system detects the marathon runner in real time. It keeps track of all the marathon runners with time details. It also has the capability of auto-foul detection.



PARAMETERS AND SPECIFICATIONS

- Distance: 21km
- Check points: 4
- No. of runners (Approx): 250-300
- Check points will be at remote locations

PC CONTROLLED GREEN HOUSE by RADHA KRISHNA NAIK

This is a computer-based control and monitoring system to maintain an ideal environment required for a particular crop in a closed chamber. Parameters controlled are air temperature, humidity, Light intensity, CO_2 concentration, irrigation, fertilizer and sunlight.