Information Brochure

Food Processing Automation Portfolio (FPA)

National Agricultural Higher Education Project

CENTRE OF EXCELLANCE : DIGITAL FAMING SOLUTIONS FOR ENHANCING PRODUCTIVITY BY ROBOTS, DRONES AND AGVS

Vasantrao Naik Marathwada krishi Vidyapeeth Parbhani, Maharashtra (INDIA)

https://nahep.vnmkv.org.in & https://nahep.vnmkv.org.in/fpa/

1. About Food Processing Automation :

- India's food ecosystem offers huge opportunities for investments with stimulating growth in the food retail sector, favorable economic policies and attractive fiscal incentives. The food & grocery market in India is the sixth largest in the world. Food & grocery retail market in India further constitutes almost 65% of the total retail market in India.

- Food Processing includes process under which any raw product of agriculture, dairy, animal husbandry, meat, poultry or fishing is transformed through a process (involving employees, power, machines or money) in such a way that its original physical properties undergo a change and the transformed product has commercial value and is suitable for human and animal consumption.

- An introduction of high-tech food processes such as automation in food materials harvesting, handling, processing, packaging, storage, transportation and distribution to increase the quality, yield, diversity of products and also to enhance their shelf life.

2. OBJECTIVE:

1. Establishment of advanced engineering hardware and software setup for Mechatronics, CAD/CAM/CAE, 3-D printers and instrumentation laboratory to support application of Agri-Bots, Agri-Drones and Agri-AGVs in food processing industry.

2. Strengthening of PG and Ph D courses in food processing automation by offering three elective/ certificate courses on Robotics, Drones and AGVs and their applications in Food Processing.

3. Development of case studies/ projects on application of Agri-Bots, Agri-Drones and Agri-AGVs in food industry.

4. Skills development of UG/PG/ PhD students and Faculty of University through academic research in food processing automation.

5. Establishment of University- Industry interface at national and international level for increasing employment opportunities.

6. Exposure to the PG and PhD students with the applications of Agri-Bots, Agri-Drones and Agri-AGVs in food processing.

7. Development of practical applications of advanced techniques in fruit and vegetable processing.
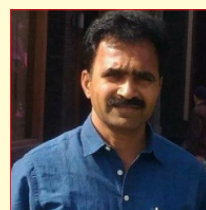
FPA Portfolio Human Resources :

Dr. G.U. Shinde
Principal Investigator

Dr. S.R. Garud
Co- Principal Investigator

Dr. R.B. Kshirsagar
Core Team Member

Dr. B.S. Agarkar
Core Team Member; Student
Relation & Liaison Officer
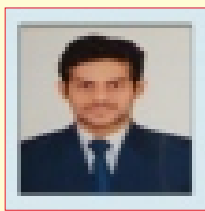
Dr. R.B. Deshmukh
Associate Member

Dr. Pravin Ghatge
Associate Member

Er. Ravikumar Kollji
Research Associate

Dr. A.S. Kakade
Senior Research Fellow

Er. G.D. Raner
Junior Engineer (Agril. Engg)

Mrs. R.B. Dhage
Office Assistant

Mr. J.R. Mane
Field Assistant

Capacity Buliding :

1. List of courses under FPA:

For Three Certificate Courses following are courses under FPA:

  1. PGD-AGAGV's-204: Agricultural AGV's in FPA

  2. PGD-AGDRONES-204: Agricultural Drones in FPA

  3. PGD-AGBOT-204: Agricultural Robotics in FPA

  Following are the elective courses will be selected for NAHEP VNMKV Certificate courses with interdisciplinary faculty involvement and enhancement of skills in handling advanced digital devices such as Agribots, Agri-Drones and Agri-AGVs for productivity enhancement.

● **Fundamental Courses**
  1. Modern Material Handling Systems
  2. Product design and development
  3. Advanced Material & processing
  4. Design Optimization

● **Interdisciplinary Courses**
  1. Automation In Fruits And Vegetable Processing Plant
  2. Smart Food Process Condition Monitoring
  3. Digital System Management In Seed Production, Processing And Quality Assurance
  4. Design of Experiment

2. Activities planned under FPA:

1. Design and Development of 3D Food Printer in collaboration with IIT Kharagpur (Knowledge Partner) for conducting PG/Ph.D research experimentation and standardization of innovative processing technology.
2. Design and Development of Model for the Detection of Onion Storage Losses in collaboration with IIT Bombay (Knowledge Partner) for conducting PG/Ph.D research experimentation and standardization of innovative processing technology.
3. Development of Food Technology Unit at NAHEP-CAAST DFSRDA Center.
4. One International e-workshop on Emerging AUTOMATION TECHNOLOGIES IN AGRICULTURE AND FOOD PROCESSING.
5. One National e-workshop on value through food processing.
6. Two Days One e-conference innovative agriculture technologies for food securities.
7. Three hands on trainings:
  I) Texture Analyzer
  II) Colorimeter
  III) HACCP : Hazard Analysis Critical Control Point
8. Revenue generation through value addition
9. Revenue generation through prototype food processing machinery development with the help of PG/Ph.D. research scholar.

10. Plan to created a hi-tech, state of the art food processing business incubation-cum-training centre with sales outlet as Food Processing Incubation Model in VNMKV campus. Which offers short and long term hands-on training (skill development training) to rural youth, women self help groups, producers, students, new and experienced entrepreneurs and other stake holders and technical consultancy services for the startups to establish food industries. The facilities including the equipment and machinery are given on rental basis to stake holders who wish to produce and market test their produce before venturing in the food processing businesses to generate revenue for NAHEP VNMKV Centre

3. Brain Storming Workshops:

Brain storming workshops for PG/Ph.D students, faculties of VNMKV for participation in NAHEP Project activities were organized by NAHEP team at various departments of VNMKV.

4. Facilities Available for PG and PhD. Research Scholar Under FPA Portfolio @ NAHEP VNMKV PARBHANI:

4. 1. CAD/CAE Laboratory for Design and Development of Food Processing Equipment.

4.2. Thermal Analysis of Food Processing Equipment.

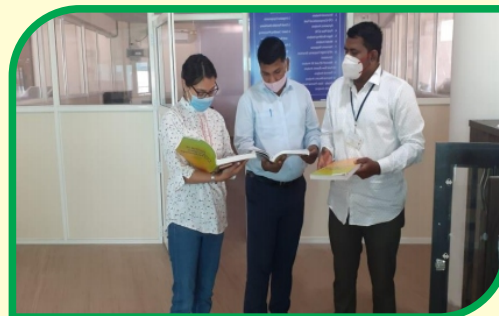**4.3. Cold Storage facility for Research Scholar to conduct research work.**

4.4. Refrigeration Van for smoothly handling of fresh commodities viz. fruits and vegetables; dairy products; cold drinks; beverages etc.

4.5. Disinfection Box.

4.6. NAHEP Library for Strengthening PG and PhD Research Scholar in their research activity.

5. Trainings Conducted:

Sr. No.	National & International training	No. of participants	Duration	Activity
1	One Week <u>Online training</u> on **"Recent Trends in Academic Writing"** organized by Dr. Santosh Kadam VNMKV Parbhani.	424	20/5/2020 - 24/05/2020	
2	One day Krushi Parisavad organized by Dr. Kapse sir on **"Soybean Lagwad Technology Parisanvad With Agriculture Minister"**	990	02/06/2020	
3	One-week <u>online Training</u> Programme **on "COVID 19 Pandemic: Impact and Strategies in Agriculture Education"** was organized by Dr. Veena Bhalerao Core Team member.	401	09/06/2020 - 13/06/2020	
4	One-week <u>online Training</u> Programme **on "COVID 19 Pandemic: Impact and Strategies in Agriculture Education"** was organized by Dr. Veena Bhalerao Core Team member.	401	09/06/2020 - 13/06/2020	

Sr. No.	National & International training	No. of participants	Duration	Activity
5	Inauguration of Joint activity of IIT Bombay with NAHEP CAAST VNMKV in which Three weeks online short term course to NAHEP CAAST students and faculties on "Application of digital technologies for smart agriculture"	52	10/8/2020 - 28/8/2020	
6	One day webinar organized by Dr. Shyam Graud Co-PI (FPA) on **"Enhancing research writing skills of students and scholars: Citations Management" (FPA Portfolio)**	345	08/05/2020	
7	One Week webinar on **"Role of Technologies and Automation in Food Processing and Preservation"** (FPA Portfolio) organized by Dr. Shyam Graud Co-PI (FPA),	365	14/05/2020 - 19/05/2020	
8	Dr. Veena Bhalerao (Core Team member) organized webinar Series of one week on **"Digital Agriculture Technologies for self-Reliance of farm woman"**	740	06/07/2020 - 10/07/2020	

Sr. No.	National & International training	No. of participants	Duration	Activity
9	State level one week webinar series organized by Dr. Rajesh Kshirsagar (core Team Member) on "डिजिटल तंत्रज्ञानद्वारे कृषी प्राक्रिया उद्योग: उद्योजकांच्या यशोगाथा".	996	27/7/2020 - 31/07/2020	
10	Three Days Online Training on " **Personality Development and Life Skills**"	86	03/03/2020 - 05/03/2020	
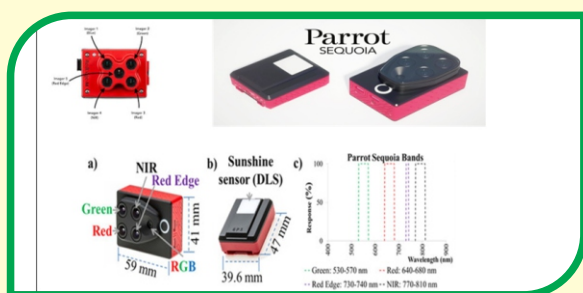
Multi spectiral Camera

Zed Camera

Lidar Camera : D435i

Real sense Camera : D435i

Stereo Vision Camera

Spectroradiometer

Multispectral Camera; Real-sense Camera : a) (D435i), b) LIDAR; ZED 2 Camera; Stereo Vison Camera; Spectroradiometer for image processing in Food Processing Automation (FPA) portfolio