



**Centre of Excellence for Digital Farming Solutions for Enhancing
Productivity by Robots, Drones and Agv's**

Information Brochure

Automated Guided Vehicle Division



Vasantkrishi Naik Marathwada Krishi Vidyapeeth

Parbhani-431402, (M.S)

About AGV Division

NAHEP project formulated by ICAR it aims to develop resources and mechanism for supporting infrastructure, student & faculty advancement under agricultural universities which will raise the standard of current agricultural education system that provides more jobs and is entrepreneurship oriented with the global agriculture education standards. There are four key components Institutional Development Plan (IDP), Centres for Advanced Agricultural Sciences and Technology (CAAST), ICAR to support excellence in agricultural universities (AUs), and ICAR Innovation Grants to AUs.

NAHEP CAAST DFSRDA is implemented in VNMKV, Parbhani. NAHEP Parbhani Center is integrating three interdisciplinary divisions of Agri-Bots, Agri-Drones and Agri-AGVs for their applications in five portfolios.

1. Climate Based Digital Knowledge Support Centre (CDKS)
2. Seed/ Seedling Processing and Nursery Automation Centre (SSPN)
3. Smart Portable Machinery Centre (SPM)
4. Food Processing Automation Centre (FPA)
5. Instrumentation Cell(IC)

In the present work, an automated guided vehicles (AGVs) are proposed to replace manual task wherever the possibility across agricultural systems and allied sciences. The proposed automation system has the ability to replace manual labour in hazardous working areas of farms on appropriate positions automatically or with less manpower needed. The AGV is presented to navigate independently through the row crops in a field, aided with different sensors and a robotic arm with a gripper to achieve various tasks. Optimizing AGV's size is really significant while it is used in any material handling like in Agriculture purposes. Thus, this AGV will be constructed in a way that the size would significantly promote energy consumption and it does not impact the operation field and performance, by that material handling system such as space utilizing, energy and simplification principle are developed. Thus, AGVs will be constructed in a way that the size would significantly promote less energy consumption and improve the field operations output and performance.

Objectives

- Establishment of advanced laboratories for Designing & developing customize low cost Agri-AGVs
 - Provide Technical Knowledge to agri PG/Ph.D students on CAD/CAE tools for designing of different smart farming machines and digital farming equipment.
 - Impart Knowledge for Hydraulic and Pneumatic technologies in food processing and customized farming operations.
- Endeavor to develop a research performance evaluation system in SPM,FPA to encourage the researcher, PG students to carry out research activities in AGV division
- Raise the capacity among the faculties/scientist/PG-Ph.D. students/ rural entrepreneurs for the development and adoption of the mechatronics, precision agricultural techniques.
- Development of different mobile applications, software programs, Decision support systems etc. on digital farming for effective dissemination of advanced farming technologies among different stake holders.
- Conduction of National/ International seminars, conferences/exhibitions/ stakeholder interface meetings for improving students and faculty research approach.

Human Resource

Core Team Members

Sr.No	Name of Employee	Designation
1.	Dr.Gopal U .Shinde	Principal Investigator
2.	Er.S.N Pawar	Co-Principal Investigator
3.	Er.D.V Patil	Core Team Member SPM
4.	Er.D.D Tekale	Core Team Member SPM
5.	Dr.V.S Bhalerao	Core Team Member SPM,FPA
6.	Dr.P.S.Kapse	Core Team Member SPM,FPA
7.	Dr.R.P Kadam	Core Team Member SPM,FPA
8.	Dr.G.S Pawar	Core Team Member FPA
9.	Dr.V.N Shinde	Core Team Member FPA
10.	Dr.S.R Garud	Core Team Member FPA

NAHEP Team Members

Sr.No	Name of Employee	Designation
1.	Er.Ravi kumar kalloji	Research Associate
2.	Dr.Awinash Kakade	Senior Research Fellow(FPA)
3.	Er.Shivanand Shivpuje	Junior Research Fellow(SPM)
4.	Er.Gopal Raner	Junior Engineer
5.	Er.Apurva Deshmukh	Junior Engineer
6.	Mrs.Rekha Dhage	Computer Operator
7.	Mr.Jagdish Mane	Field Assistant

Capacity Building

I.Certificate Courses

Sr.No	Course No.	Course Name
1	DFSRDA AGAGV-101	Fundamentals of Agri-AGV
2	DFSRDA AGAGV-102	CAD/CAM in Agri-AGV
3	DFSRDA AGAGV-103	Agri-AGV Mechatronics
4	DFSRDA AGAGV-104	Agri-AGV Computing
5	DFSRDA AGAGV-105	Agri-AGV Maintenance
6	DFSRDA AGAGV-201	Agri-AGV in CDKS
7	DFSRDA AGAGV-202	Agri-AGV in SSPN
8	DFSRDA AGAGV-203	Agri-AGV in SPM
9	DFSRDA AGAGV-204	Agri-AGV in FPA

II. Facilities Established

I. CAD/CAE Lab

CAD/CAE lab Computer-aided design & computer-aided engineering (CAD/CAE) lab is developed to design prototypes and manufacture, produce different agricultural machines. By using CAD/CAE students are able to design different 3 D model for drones, Robots, AGV and they can do its analysis, testing and simulation. ANSYS software tools are procured for CAD/CAE analysis.



II. Agri-AGVs Workshop

The workshop allows our students and trainees to develop a wide range of skills with the use of tools during practical classes and project works. Equipment includes welding machine, drilling machine, grinding machine etc. AGV engineering workshop is developed for designing and development of different mechanical parts required for manufacturing of various agricultural equipment and AGV.

With Artec Eva lite 3D Scanner Scanning, you can now achieve the very best in scanning results also using your own software, integrating Artec Eva into almost any system. Either adapt your current software to support Eva, or develop your own software to spec. Whether you want to scan for medical purposes, industrial quality control, or reverse engineering, Eva can be easily assimilated into your specialized solution. Artec Eva lite 3D Scanner can also be used with Artec L2, a 3D scanner with a wider field of view, specifically developed for built-in scanning solutions.



III. Smart Portable Machinery center (SPM)

Smart farming is the integration of existing farming practices with advanced technologies. Similarly, smart portable machines are the devices/ tools embedded with advanced computing / information technologies such as artificial intelligence (AI), machine learning or deep learning, all of which it uses to reason, problem solve, make decisions and even ultimately take actions. Most of the current and impending agricultural technologies fall into three categories that are expected to become the pillars of the smart farm i.e. autonomous robots, drones, sensors and the Internet of



V. Food Technology Unit

In AGV division under FPA portfolio food technology unit is proposed for checking quality of different fruits, food items. Advance digital equipment's are provided in this lab for identification food quality, Colour, Moisture etc. it will helpful for identification of value added food products. This lab installation is in progress.



Glimpses



