



Template for Evidence(s) UI GreenMetric Questionnaire

University : Karunya Institute of Technology and Sciences
Country : India
Web Address : www.karunya.edu

[6] Education and Research (ED)

[6.4] Total Research Funds Dedicated to Sustainability Research (in US Dollars)

Development of Electronic Speed Controller for Actuator with Feedback Mechanism

Completed

Principal Investigator Name:
Dr. Manoj .G
Dr. Anitha Mary. X

Funding Agency:
DRDO,DEBEL

Research Grant:
Rs. 9.37 lakh

Project Duration
2020 to 2021

Objectives

- ◆ Design and implementation of an Indigenous Speed Controller with feedback Mechanism for Maxon EC 90 flat motor
- ◆ Exoskeletons can transfer the weight of a user's arms from the shoulders, neck and upper body to the body's core, reducing physical stresses
- ◆ A soldier with an exoskeleton is capable of faster movements and possesses the extra load-bearing capability

Project Outcomes

Experimental Setup of Electronics Speed Control Actuator

Methodology

Project Outcome

Mechanical stop
 Ball Screw
 BLDC motor
 Belt drive
 Pulley connecting upper and lower segments

- ◆ Soldiers are gradually being given advanced helmets, radios, night vision goggles, body armour, which adds to the weight that fatigues.
- ◆ These Exo-suits have composite material structure with sensors and controllers interlinked in a feedback control loop via an intelligent processor.

Co-Investigator : Dr. Rajalakshmi. P



Design of 2 Tons Per Day Rotary Kiln Gasification Pilot Plant with High Calorific Value Syngas Production

On-going

Principal Investigator Name:

Dr. Madhu Ganesh

Funding Agency:

Department of Science & Technology (DST)

Research Grant:

6.12 Crore

Project Duration

2021 to 2024

Objectives

- Process R&D on enriched air gasification to improve calorific value of syngas
- The plant will process 2 TPD of multi-feedstock solid waste without expectations of any pretreatment or sorting
- Demonstration of sustainable solid waste to syngas production by rotary kiln gasification to achieve the goals of the Swachh Bharat Mission Use of Solar Energy to reduce the parasitic power consumption in the plant
- Creation of a technology platform and facility for techno-economic analysis

Project Outcomes

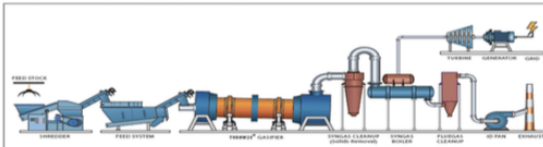
- 2 TPD Waste to Syngas Production System by Rotary Kiln Gasification
- 400 kg/hr Steam production of steam utilizing Syngas
- Tar concentration before after gas conditioning between 98 and 48 mg/Nm³
- Cold gas efficiency and carbon conversion efficiency – 65% and 71%
- Reports in international journals and conferences based on research objectives
- Reliable rotary kiln gasification of non-homogenous waste, even with unskilled operators, producing syngas with high calorific value and tar content less than 10 ppm

Impact on Society

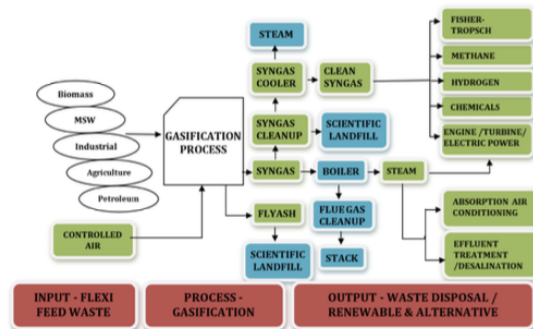
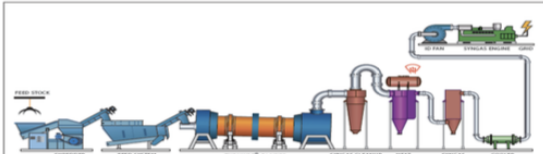
- MNRE has specifically recommended this technology for medium size cities. Coimbatore would be the Technology Demonstrator for the whole country
- There is a wood fired boiler in Vellore which is consuming firewood everyday, killing some trees. This plant can supply the steam and reduce the wood consumption
- This plant has an automated segregation system which will avoid the manual segregation being done by hands
- The pollution of water bodies by plastic can be avoided

Methodology

LAYOUT 1: TURNW2[®] INTEGRATED WITH STEAM TURBINE



LAYOUT 2: TURNW2[®] INTEGRATED WITH GAS ENGINE



Green Energy Technology

Mission

Funding Agency Logo



Project Team

Dr. S. Joseph John Marshal
Mr. Partha Das (CMERI)



Development of Cost-effective Affordable Cervical Cancer Screening Unit on Smartphone Technology On-going

Principal Investigator Name:
Dr. Kumudha Raimond

Objectives

Funding Agency:
DST-BDTD

Research Grant:
Rs. 18.53 lakh

Project Duration
2021-2022

- Design and fabricate a mechanical device for effective screening of cervical region
- Conduct a feasibility study to assess the practicality of the proposed device through preliminary clinical screening
- Propose a systematic approach to generate a labelled benchmark dataset with the help of experts for research purpose
- Compare and validate the images from the proposed device with the clinical standard digital colposcopy instrument and Pap smear test

Project Outcomes

- Cost effective cervical cancer screening device which facilitates cervical image capturing for automatic computer-aided diagnostics
- Integrated benchmark database with collection of cervical images from the proposed device, clinical standard device and Pap smear samples with manual labelling by experts
- Mobile App to be used by the Medical/Para-medical personnel in rural areas
- Awareness program to rural women on cervical cancer and its impact
- Patent on the new device

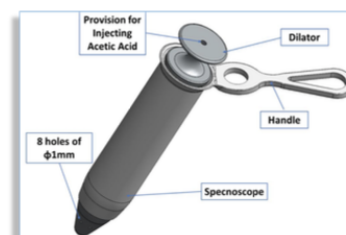
Impact on Society

- Cervical cancer, the second most common cancer among women in India which contributes to 6 to 29% of all cancers with highest incidence rate in South Asia
- It is greater among women in rural areas, due to lack of awareness and infrastructure support of latest technologies as well as experts
- Women worldwide in low-resource settings will be benefitted if cancer is diagnosed in pre-cancerous stage itself in a single visit in a cost-effective manner using latest technologies

Methodology



Product



Patent Number: 201941048985 Publication Date (U/S 11A): 13/12/2019



Team members
Dr. G. Babu Rao
Dr. Kurinji Priya
Dr. D. Sujitha Juliet

Karunya **Design and Development of a Low-Cost Medical Glove for Hand Tremor Management Caused by Parkinson's Disease** Completed

Principal Investigator Name:
Dr D Raveena Judie Dolly

Objectives

Funding Agency:
ICMR Govt. of India

- Reduce the hand tremor caused by Parkinson's disease
- Developing a low cost medical glove
- Develop a novel non-invasive assistive device for managing the Parkinson's disease

Research Grant:
Rs. 10.2 lakh

Project Outcomes

Project Duration:
2021 to 2022



Front Public Health, 2022; 10: 850805.
Published online 2022 Apr 26. doi: 10.3389/fpubh.2022.850805

PMCID: PMC9067179
PMID: 35558530



Assistive Methodologies for Parkinson's Disease Tremor Management—A Health Opinion

V. Dineshkumar,¹ D. Raveena Judie Dolly,^{1*} D. J. Jagannath,^{2,1,*} and J. Dinesh Peter²

Methodology



icmr
INDIAN COUNCIL OF MEDICAL RESEARCH
Serving the nation since 1911

Co-Investigators

Dr. D. J. Jagannath
Dr. J. Dinesh Peter



Machine Learning Technologies
for
Societal Problems Mission



Karunya **Recovery of Value Added Materials from Non-hazardous Wastes of Silkworm Industries** **On-going**

Principal Investigator Name:
Dr. S. VASANTHKUMAR

Funding Agency:
DST-Waste Management

Research Grant:
Rs. 69.47 lakh

Project Duration
2020-2023

Objectives

- ✓ Mechanical expelling machine that can physically separate chitinaceous solid and protein/lipid fluid fractions in cocoon waste
- ✓ Hybrid centrifuge – solvent extraction unit that can separate the emulsion into sericin fraction, oil fraction and Aqueous fraction
- ✓ Link chitinaceous matrix for use in biocontrol
- ✓ Purify the sericin protein by mechanical and biochemical methods
- ✓ Evaluate the utility of lipid fraction in bio-fuel and other applications
- ✓ Anaerobically digest all the biodegradable waste generated out of this into biogas and organic manure

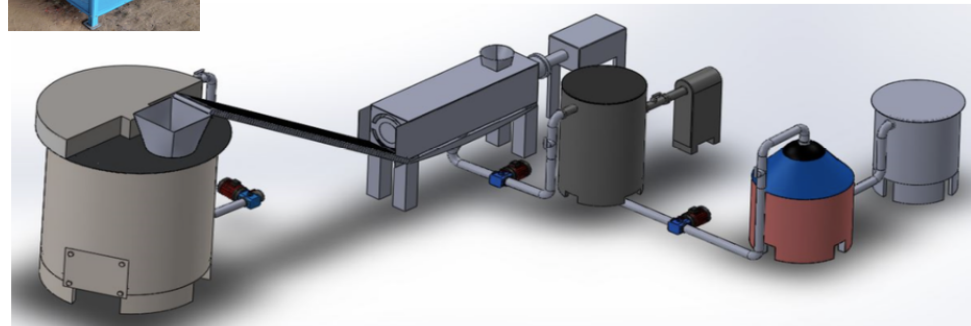
Project Outcomes

- ❖ 50000 MT silkworm waste produced per year requirement of viable technology for cocoon waste processing leading to start up/MSME.
- ❖ this project will provide financially viable value adding, zero discharge process



Impact on Society

- ❖ To integrate the existing sericulture development program with this project such that value addition become an integral part of sericulture
- ❖ The chitinaceous matrix used in biocontrol agent will be one of the most potent organic pesticide ever as the chitin matrix of larvae is similar to the chitin exo-skeleton of pest larvae



Fabrication of recovery of value added material from silkworm wastes



Dr. C. N. Manoj,
Pelican Biotech & Chemical
Labs, Pvt. Ltd., Kerala.

Principal Investigator Name:
Dr. D Sujitha Juliet

Objectives

Funding Agency:
DST-NRDMs

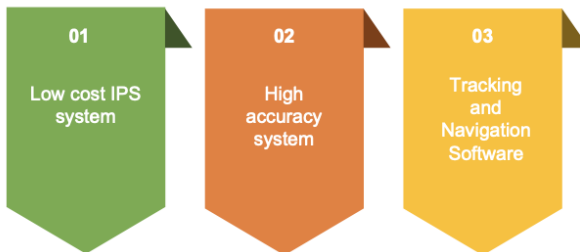
Research Grant:
Rs 27.89 lakh

Project Duration
2021 - 2023

- Tracking of Assets- The accurate tracking and localization of assets inside the industry premises using UWB along with TDoA method
- Navigation of assets- To track the navigation of the assets coming in and out to the industry from a desired source to its location
- Monitoring of Assets -To monitor the where about of the assets continually using a data analysis software

Project Outcomes

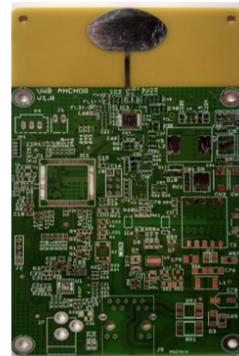
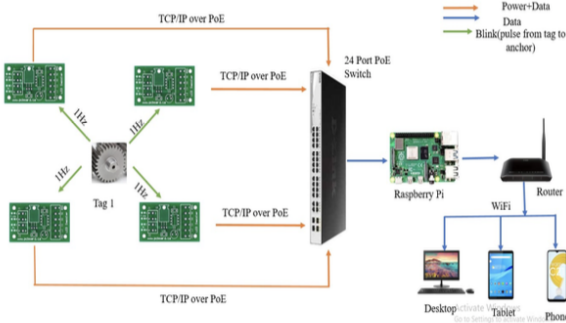
Impact on Society



- Smart Factory
- Real-time tracking and monitoring of assets in industrial work floor
- Precise indoor positioning and navigation system for industries
- Optimized equipment maintenance costs

Methodology

Product Design



Patent : Published
(Ref No: **02241029347 A**
Publications : 4,
PhDs : 1
Project beneficiaries :
Industries with complex environment



Smart City Mission



Other Investigator:
Dr Kirubakaran Ezra,
Professor , CSE

Description:

All research activities at Karunya are focused towards solving the problems of humanity. Thrust is given to align all research with respect to SDGs. Twenty Five Technology Missions are identified and faculty members and students are grouped under one or more Technology Missions. The events conducted through these missions and research carried out by the faculty members and students evolve solutions to solve the problems associated with SDGs.



Total research fund dedicated to sustainability research in 2020 = 24621 US Dollars

Total research fund dedicated to sustainability research in 2021 = 24752 US Dollars

Total research fund dedicated to sustainability research in 2022 = 65092 US Dollars

The averaged annum last 3 years of research fund dedicated to sustainability research = 38155 US Dollars