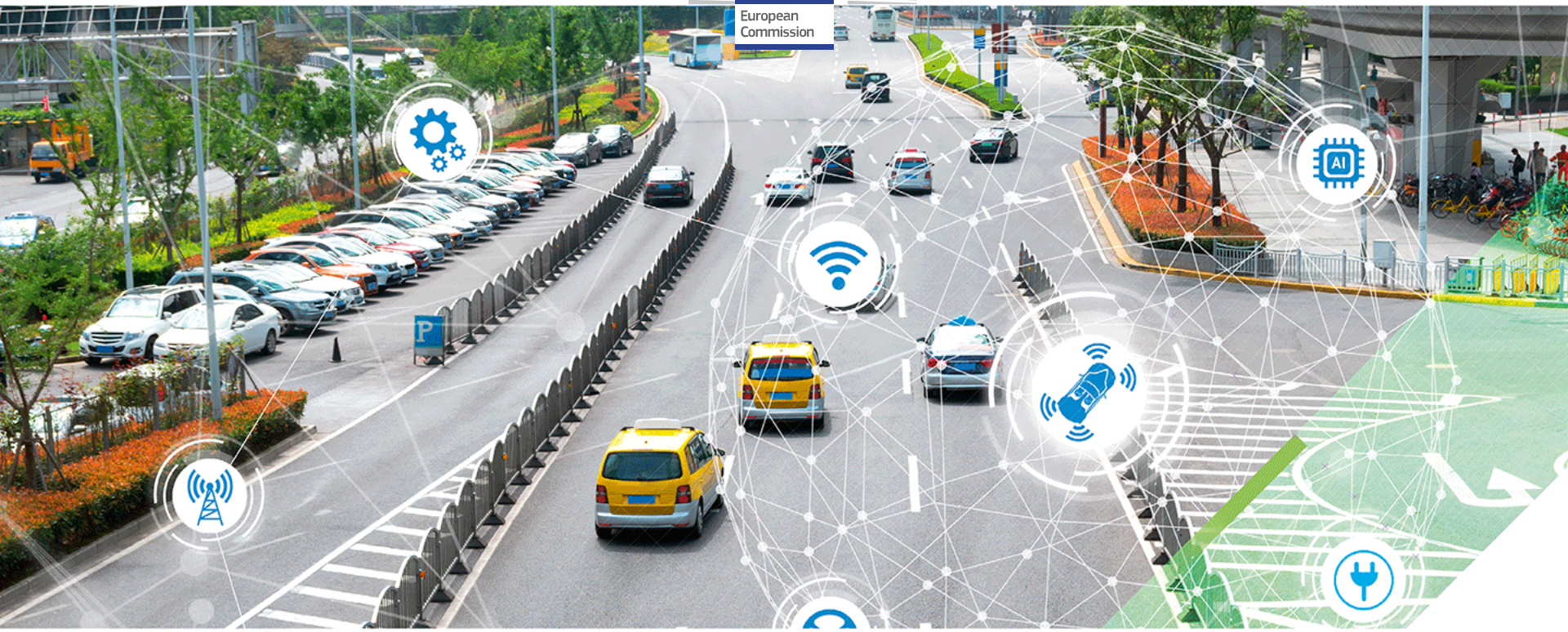

GALILEO EGNOS
NAVIGATION MADE IN EUROPE

GALILEO Hackathon in Bangalore

Pieter De Smet, European Commission

ICG-14, Bangalore, 8-13 November 2019

Galileo Hackathon in Bangalore – by GNSS.asia

- What is GNSS.asia?
- Activities and cooperation in India
- Galileo Hackathon in March 2019

What is GNSS.asia?

GNSS.asia teams in Europe and Asia

EUROPE

Rainer Horn
Project Coordinator

Hannes Dekeyser
Deputy Project Coordinator

Stephanie Pradier
Communications

Daniel Ludwig
GNSS Expert

ASIA

Varadarajan Krish
GNSS.asia IN
IIRA

Angela Hsiao
GNSS.asia TW
ECCT

Tiantian Qi
GNSS.asia CN
EUCCC

Fabrizio Mura
GNSS.asia JP
EU-JP Centre

Ravikumar
GNSS.asia IN
IIRA

In-Seung Kay
GNSS.asia Korea
SpaceTec Partners

Davof Xu
GNSS.asia CN
China Expert

Akira Akasaka
GNSS.asia JP
EU-JP Centre

The GNSS.asia partner networks in Asia

Galileo Hackathon in Bangalore – by GNSS.asia

- What is GNSS.asia?
- Activities and cooperation in India
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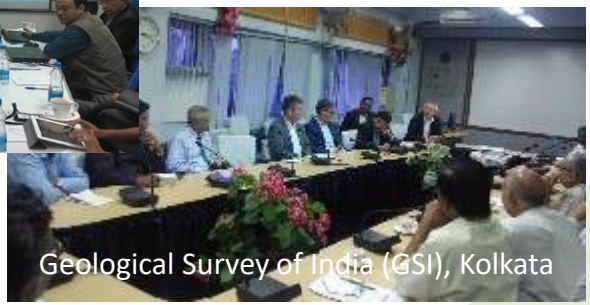
Successful cooperation with India since 2013

Annual Industry Workshop, Bangalore (2013)



Industry visits of EU delegation, Bangalore & Kolkata

Round Table Meetings, Mumbai, Chennai, Pune & New Delhi (2013)

AIRPORTS AUTHORITY OF INDIA

GNSS.asia delegation visit at AAI, Delhi (2013)

Successful cooperation with India since 2013

GNSS.asia seminar, Delhi (2014)

GNSS.asia delegation visit of GAGAN Control Centre

Meeting with Railway Board, Delhi (2014)

Industry Seminar, Bengaluru (2016)

Successful cooperation with India since 2013

Company visits, Bangalore (2016)

AAI/ISRO delegation visiting Munich (March 2019)

GNSS.asia Challenge Winners from India

Meeting GSA-ISRO, Bengaluru (March 2019)

Galileo Hackathon in Bangalore – by GNSS.asia

- What is GNSS.asia?
- Activities and cooperation in India
- Galileo Hackathon in March 2019

Galileo Hackathon in March 2019

Addressing multiple objectives at once

- **Innovation cooperation**: Opportunity for India and EU innovators to co-create GNSS-based solutions

- **Galileo knowhow:** Outreach to local GNSS communities to use Galileo for country-tailored solutions

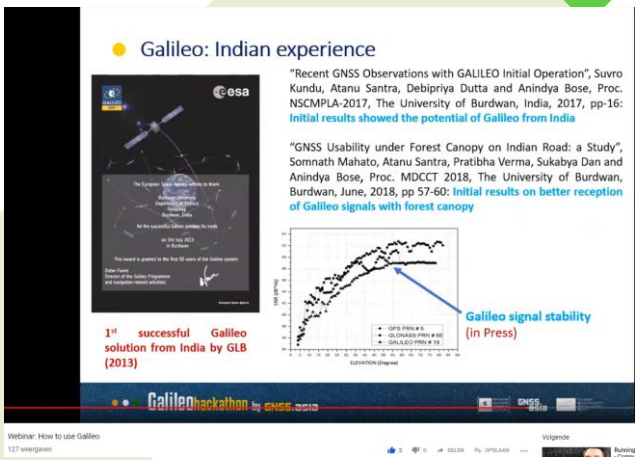
- **Industry branding:** Platform for GNSS industries to present products and services to participants and future innovators

- **Industry partnering:** Occasion for B2B and B2G side-meetings for industry and start-ups

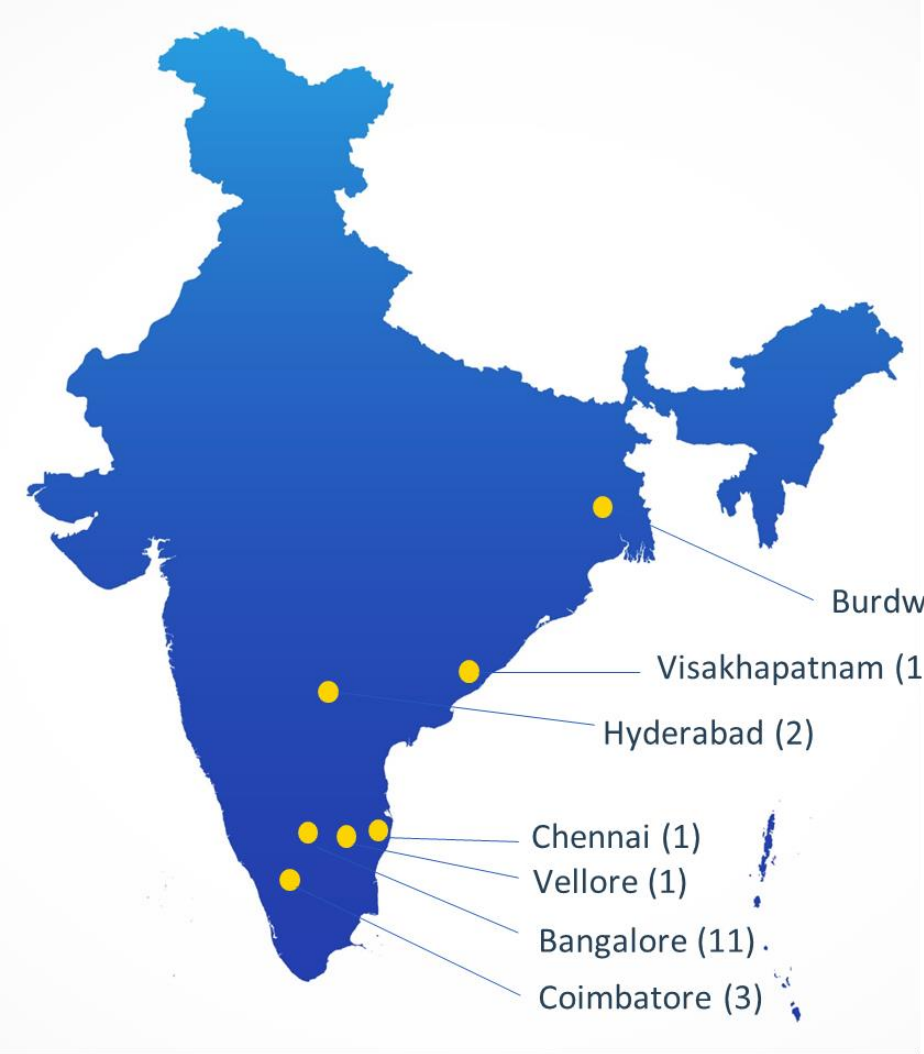
- **Talent acquisition:** New way of sourcing innovation and talent for GNSS and user industry

Practical details

- **Date:** 16-17 March 2019
- **Venue**: PES University, Bangalore
- **EU presence:** European GNSS Agency & GNSS.asia team
- **India presence:** ISRO
- Two **training sessions** before the hackathon through webinars
  - Introduction to GNSS technology + Galileo differentiators
  - GNSS market and business models
- **Idea competition**: 24 hours to address a challenge using Galileo



The Participants



- Over 300 applications!
- 20 teams, **81 selected participants**
- Representation from **all over India** (Tamil Nadu, Karnataka, Telangana, Andhra Pradesh, West Bengal…)
- **University and Corporate** Teams

The Participants

GALILEO EGNOS
NAVIGATION MADE IN EUROPE

RAMAIAH Institute of Technology

CHENNAI INSTITUTE OF TECHNOLOGY
Transforming Lives

DAYANANDA SAGAR INSTITUTIONS
ESTD. 1960 BANGALORE INDIA

Global Academy of Technology
Growing Ahead Of Time

ENLIGHTENMENT THROUGH EDUCATION
SREC

UNIVERSITY of BURDWAN

AMRITA VISHWA VIDYAPEETHAM

PES UNIVERSITY

HEXAGON

HINDUSTHAN EDUCATIONAL AND CHARITABLE TRUST
HECT
Hindusthan
College of Engineering and Technology
(An Autonomous Institution)
Approved by AICTE, Affiliated to Anna University, Chennai
Accredited by NBA, Accredited with 'A' Grade by NAAC

VIT
Vellore Institute of Technology
(Deemed to be University under section 3 of UGC Act, 1956)

VIGNAN
INSTITUTE OF INFORMATION TECHNOLOGY

pwc

Industry Engagement

- Corporate teams
  - Hexagon – sent 2 teams
  - PWC
  - MindTree
- Jury Members & Mentors
  - StartupXseed
  - StartUp360
  - Citrix
  - Volvo Trucks
  - Magnasoft
- Promotion Partners
  - Bosch DNA Accelerator
  - SAP

The Challenge

To develop an innovative **Urban Mobility / Smarty City Solution**, using Galileo, which provides one of the following:

1. A user-friendly, fast and cost-efficient A-Z **transport solution** for Bangalore
2. A **smart city** solution for citizens who are **disadvantaged** and/or with health issues
3. A **smart city** solution for the **safety** of vulnerable population groups
4. Other smart solutions for Bangalore, India or globally, using Galileo

The Solutions

- Reward-based system for green/public transportation MaaS-app
- Car-sharing app (with or without chauffeurs)
- Road emergency assistance
- Parking app (traffic jams)

- Supply chain app for agricultural industry (farmer-buyer marketplace)

- Security app for women

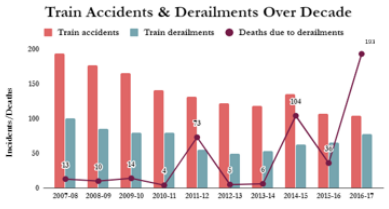
- Rail track maintenance system geotagging potential fault locations (**winner**)

The Winner

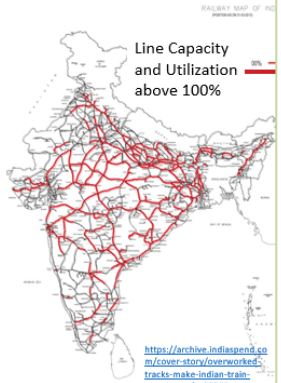
Market Potential (I)

Indian Railways, a ticking time bomb.

- Over 60% of tracks utilized over 100% ---->
- Train Derailment continues to be a major contributor to Train Accidents (over 50% in recent years).



https://archive.indiaspend.com/special-reports/fy-2016-17-indias-derailment-death-toll-highest-in-a-decade-12940

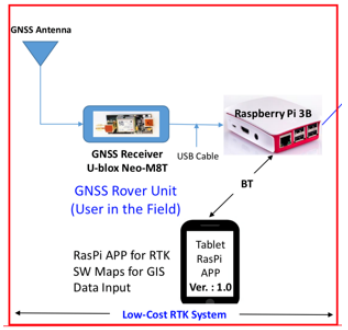


https://archive.indiaspend.com/cover-story/overworked-tracks-make-indian-train-travel-unsafe-66568

Technical Back-End (I)

The technical backend would be devised using the following hardware components enforced by software techniques such as machine learning:

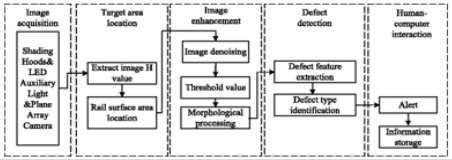
- High shutter speed camera
- Light source for the camera
- Data storage and transmission system
- Galileo receiver (Low Cost, High accuracy RTK System)



Dinesh Manandhar, CSIS, The University of Tokyo

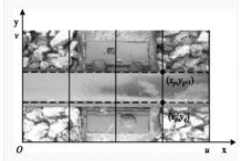
Technical Back-End (II)

- The images are captured and collected with an appropriate camera (High Shutter Speed). The stored images are pre-processed to find the target area, post-capture.
- Images are de-noised and morphological processes are run on these to detect defects. The locations are timestamped with the images and hence we will know the location of the defect accurately.
- Multiple passes over the target are ensure that it is sufficiently covered despite not having a continuous feed.



Proof of Concept (I)

A paper has been implemented which incorporates the image processing explained in the Technical Backend (II) in Real Time.



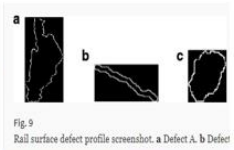
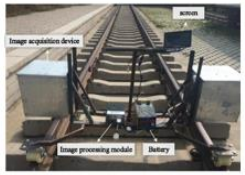


Fig. 9
Rail surface defect profile screenshot. a Defect A. b Defect

Speed at which the system travels : 19m/s
(Roughly 70 Km/h)



The Winner

Accuracy Matters.
When close isn't enough,
use Galileo!
Galileohackathon
by GNSS.asia
160,000 INR

Feedback to the hackathon

“Thanks for inviting us.. it was very good event. So happy, because of so good engagement and people interest.”
Dhananjaya Tripathi, Head of Innovation, Volvo Trucks India

“Out of the 19 ideas only 3 were not good. This is remarkable as these are mostly only colleague students. I look forward to mentoring the winners.”
Ashok G, Startup 360, Seed Investor

“We were amazed by the way the GNSS.asia Galileo Hackathon was conducted. Our students were thrilled to be part of the event.”
Prof. Dr. Rajasekar, PES University

DR. M.R. DORESWAMY SILVER JUBILEE COMPLEX

NavPro
PES University

Also the press was present!

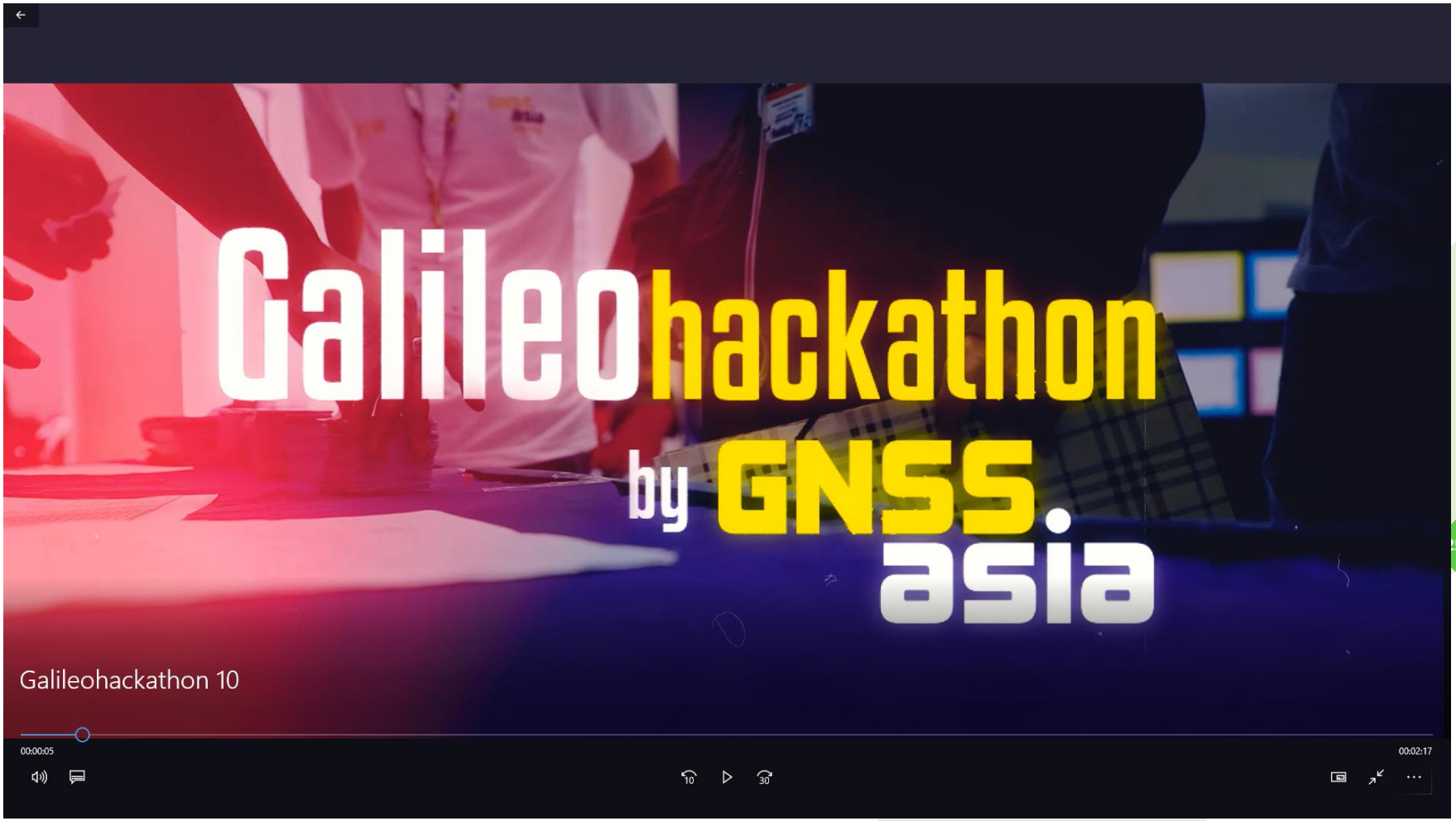
గెలిలియో హ్యాకథాన్‌లో పీఈఎస్ బృందానికి నగదు బహుమతి

బెంగళూరు, మార్చి 18 (ఆంధ్రజ్యోతి): జెఎన్ఎన్ఎస్ ఏషియాచే పీఈఎస్ యూనివ ర్శిటీ ప్రాంగణంలో 36గంటల పాటు నిరంత రంగా సాగిన గెలి లియో హ్యాకథాన్ జరిగింది. అంతర్జాతీయ స్థాయిలో సాగిన సెమినార్‌కు దేశవిదేశాలకు చెందిన బృందాలు పాల్గొన్నాయి. దేశంలోని వివిధ విశ్వ విద్యాల యాల నుంచి వచ్చిన బృందాలు సాంకేతిక సిద్దాంతాలకు అను గుణంగా నిరంతరంగా గెలిలియో టెక్నాలజీపై చర్చలు సాగాయి. గెలిలియో టెక్నాలజీ యూ రప్‌కు చెందిన శ్యాటిలైట్ న్యావిగేషన్ పద్దతిలో సాగే విధానం. రైల్వే పట్టాల ద్వారా వచ్చే శబ్దా న్ని బట్టి గెలిలియో సాంకేతికతకు అనుగుణంగా రూపకల్పన చేసిన మేరకు పీఈఎస్ యూనివ ర్శిటీ బృందానికి రూ.16వేల నగదు బహుమతి దక్కింది. పట్టాల ద్వారా వచ్చే శబ్దాలకు అను గుణమైన చిత్రాల ద్వారా ప్రమాదాలను గుర్తిం చేలాంటి ప్రయోగాన్ని రూపొందించారు. హ్యాకథాన్‌లో పాల్గొన్న బృందాలు సమర్పించిన పేపర్ పాయింట్ ప్రజెంటేషన్‌లు సరికొత్త ప్ర యోగాలకు మార్గదర్శకం కానుందని నిర్వాహ కులు తెలిపారు.

నగదు పురస్కారం అందుకుంటున్న పీఈఎస్ విద్యార్థుల బృందం

ఆంధ్రజ్యోతి Tue, 19 March 2019
https://epaper.andhrajyothy.com/c/37736838

Aftermovie


Galileohackathon
by GNSS.
asia
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