
AUTOMATIC CONTROL AND DYNAMIC OPTIMIZATION SOCIETY



Annual Report for 2021-2022

to be presented on

29th October 2022

in the

Annual General Body Meeting



Automatic Control & Dynamic Optimization Society
Indian National Member Organization of
INTERNATIONAL FEDERATION OF AUTOMATIC CONTROL



Contents

Section A: Introduction

Section B: Major Activities/Events/Programs during 2021-22

Section C: Upcoming Events/Activities during 2022-23

Section D: ACDOS-Budget/ Finances/Accounts



Automatic Control & Dynamic Optimization Society
Indian National Member Organization of
INTERNATIONAL FEDERATION OF AUTOMATIC CONTROL



Section A: Introduction

Automatic Control and Dynamic Optimization Society (ACDOS) was established in 2011 with the noble objective of promoting automatic control and dynamic optimization discipline in academia and industry across India and the globe. The society aims to regularly host international conferences, symposiums, technical workshops and invited talks in India to promote a close interaction between industry and academia. ACDOS is a National Member Organization (NMO) of the International Federation of Automatic Control (IFAC), which has its presence in over 50 countries worldwide with a mission to promote the science and technology of automatic control through technical meetings, publications, and other means.

The ACDOS was registered on 8th July 2011 with the state government of Karnataka. The current office bearers of the society are as follows:

1	President	Prof. Sukumar Mishra
2	Vice-President & President-Elect	Dr. Jayesh Barve
3	Vice President	Prof. Bidyadhar Subudhi
4	Vice President	Prof. SK. Faruque Ali
5	General Secretary	Dr. Arnab Maity
6	Joint Secretary	Dr. Tousif Khan N
7	Treasurer	Dr. S. N. Omkar
8	Director of Operations	Prof. Radhkant Padhi
9	Executive Committee Member	Dr. Sheshagiri Rao Ambati
10	Executive Committee Member	Dr. G R Jayanth
11	Executive Committee Member	Prof. Suresh Sundaram
12	Executive Committee Member	Prof. George V.I
13	Executive Committee Member	Dr. Awadesh Kumar
14	Executive Committee Member	Mr. Kishan Chowhan
15	Executive Committee Member	Dr. Vipin C Pal
16	Executive Committee Member	Dr. Rajeeb Dey
17	Immediate Past President	Prof. Ravindra D Gudi

Section B: Major Activities/Events/Programs in 2021–2022

Two events were conducted under the banner of ACDOS from November 2021 to till October 2022.

- **Event 1:** The 7th International Conference of “Advances in Control and Optimization of Dynamical Systems (ACODS) 2022” was held on February 22-25, 2022, at National Institute of Technology Silchar, Assam
- **Event 2:** One Week Workshop titled “Electric Vehicle: Challenges & Opportunities (EVCO-2022)” during August 22-26, 2022, in BIT Sindri, Dhanbad, Jharkhand

Event 1: ACODS 2022 – 7th IFAC International Conference on ‘Advances in Control and Optimization of Dynamical Systems

The seventh ACODS biennial flagship event, Advances in Control and Optimization of Dynamical Systems (ACODS) is hosted by the National Institute of Technology Silchar and the Indian Institute of Technology Guwahati at National Institute of Technology Silchar. The International conference was held from February 22-25, 2022. Prof. Sivaji Bandyopadhyay from NIT Silchar and Prof. T. G Sitharam from IIT Guwahati were the chief Advisors. Prof. Binoy Krishna Roy from NIT Silchar and Prof. Somanath Majhi from IIT Guwahati were the General Chairs.

ACODS 2022 aimed to bring together the international community of researchers and practitioners from academia, industry, and research laboratories to disseminate new developments and advances in control and optimization of dynamical systems.

The plenary talks delivered during ACODS 2022 were as follows:

- **Prof. Hajime Asama**, President International Federation of Automatic Control (IFAC) Professor, Robotics, University of Tokyo, Japan, delivered a talk on “**Robot Technology for Disaster Response and its Societal Dissemination**”
- **Prof. Dawn Tillbury**, Professor, Mechanical Engineering, University of Michigan, USA delivered a talk on “**System-level control for manufacturing systems: Leveraging data for improved quality and resiliency**”
- **Prof. Emilia Fridman**, Professor, School of Electrical Engineering, Tel-Aviv University delivered a talk on “**Sampled and Delayed Control of ODE and PDE Systems**”
- **Prof. Daniel Quevedo**, Professor, School of Electrical Engineering & Robotics, Queensland University of Technology, Australia, delivered a talk on “**Remote State Estimation with an Eavesdropper**”

The semi-plenary talks delivered were as follows:

- **Prof. Levente Kovacs**, Physiological Control Research Group Rector (President), Obuda University, Hungary, delivered a talk on “**Robust control of Cyber-Medical Systems**”

- **Prof. Praveen Kumar**, Electronics & Electrical Engineering, IIT Guwahati delivered a talk on “**AI & ML based motor design**”
- **Prof. Kevin Guelton**, Professor of Automatic control - Robotics and mechatronics, Universite de Reims Champagne-Ardenne, France, delivered a talk on “**Local Sampled-Data Controller Design for Continuous-Time Quasi-LPV/Takagi-Sugeno Systems: Optimizing the Estimation of Domain of Attraction**”
- **Dr. Coorous Mohtadi**, MathWorks, UK, delivered a talk on “**Advanced Control for Real World Challenges: From Theory to Practice**”
- **Prof. Saikat Chakrabarti**, Professor, IIT Kanpur, delivered a talk on “**Monitoring of smart transmission and distribution systems**”
- **Mr. Murali Krishnan**, Edutech India (P) Ltd., delivered a talk on “**Autonomous Vehicle & Its Challenges**”

Workshops conducted on 2nd February 2022, during the ACODS conference were as follows:

1. **Energy Management of xEVs: Optimal Control, Estimation and Decision Perspectives** by Prof. Siddhartha Mukhopadhyay, EE, IIT Kharagpur
2. **Hands-on Training in Strange non-chaotic Attractors** by Prof. K. Thamilmaran and his team
3. **Guidance and control of aerospace vehicles by DRDL, Hyderabad, India** by Dr. Abhijit Bhattacharya, Technology Director, Directorate of Systems, DRDL, DRDO, Hyderabad and his team
4. **Kalman filter - A journey to its present status and its MATLAB implementation (Hands-on with MathWorks Team)** by Mr Ramanuja Jagannathan, Designation: Senior Application Engineer - Control Design, MathWorks @Bangalore and his team

Robotics Competition:

A Robotics and Control workshop cum competition for the school children of Northeastern India was organized during ACODS 2022. Around 560 schools were invited, and 50 schools participated in the event. The organizers of ACODS 2022 attempted to spread the message of the need of STEM education to tap the young minds in the area of control and automation in our country through this conference.

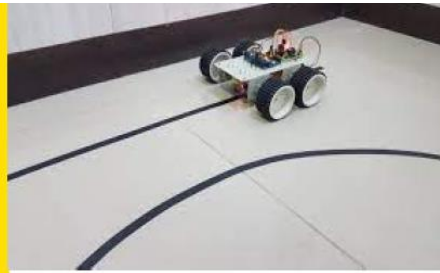
Workshop Brochure

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EVENT DETAILS

This is a Two Stage event:
 Stage 1: Workshop (12 Feb '22)
 Stage 2: Competition (23 Feb '22)

1. One half-day workshop on the afternoon of 12 February 2022 (Saturday) will be conducted via online by our technical support team.
2. After the workshop, there will be a competition to rebuild their robot and run it on a different track. The new track will be announced on 12th February 2022 after the workshop. Each group will send their video of robot running on the new track by 19th February 2022.
3. Participants may contact our technical support team after the workshop for their technical help till 19th February 2022.
4. Seven best team will be selected by the committee of judges. These teams will show online the performance of their robot on 23rd February 2022 and the best three teams will be announced.
5. Judges' decision for all matter will be treated as final.



2022 ACODS | Advances in Control & Optimization of Dynamical Systems

Organized by
 National Institute of Technology Silchar, Assam, India
 &
 Indian Institute of Technology Guwahati, Assam, India
 (February 22 - 25, 2022)

Contact us at:
bkr@ee.nits.ac.in, rajeeb@ee.nits.ac.in, acods2022@nits.ac.in

OUR TECHNICAL SUPPORT:

Technomate Edubotics Pvt. Ltd.
 Tripura
infotechnomate@gmail.com

NB - Particular Room should be Dark. Due to High Sunlight Intensity Sensor may not

ONLINE WORKSHOP
CUM COMPETITION ON
A PATH-FOLLOWING
ROBOT

Robotics events are incomplete without a line follower competition. A simple black line on a white background and your robot must follow it. Easy, right? Here's the catch. The track is filled with bends and curves. The task is to build an Autonomous robot which is capable of travelling a black line on a white background as fast as possible. The track has bends, curves, and breaks. The sensor based black line follower robots are one of the most basic robots used to follow black line on white background or vice versa. These robots may be used in various industrial and domestic applications such as to carry goods, floor cleaning, delivery services and transportation.



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“ IS THERE ANY LEARNING OUTCOME OF THE EVENT?”

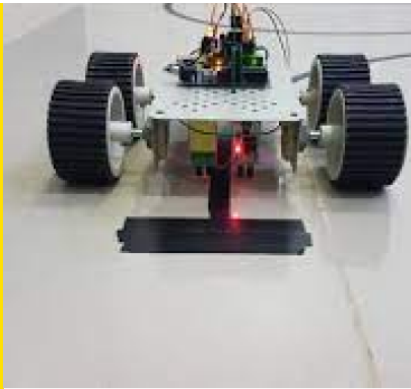
At the end of the online workshop by using the hardware available in the Atal Tinkering Laboratory of respective schools, participants are expected to :

- Learn the basics of electronics to design a circuit, writing code, which will help them to build a robot.
- View a glimpse of the world of robotics.
- Build their first working robot (for most of them)
- Gain the confidence to join the competition.
- Expose them to the vast possibilities of hardware experiments in their ATL.

WHY ONE SHOULD PARTICIPATE?”

Besides academic learning outcomes, the following may be bonus.

- *A certificate to all the participants
- *A certificate to the Laboratory In-charges of ATL for their help and assistance.
- *Prizes in kind (worth Rs, 5000/-, 3000/- and 2000/-) to the first three winning teams along with certificates.
- *An opportunity to bring your alma mater in limelight.
- *Finally, an opportunity to connect with NIT Silchar.



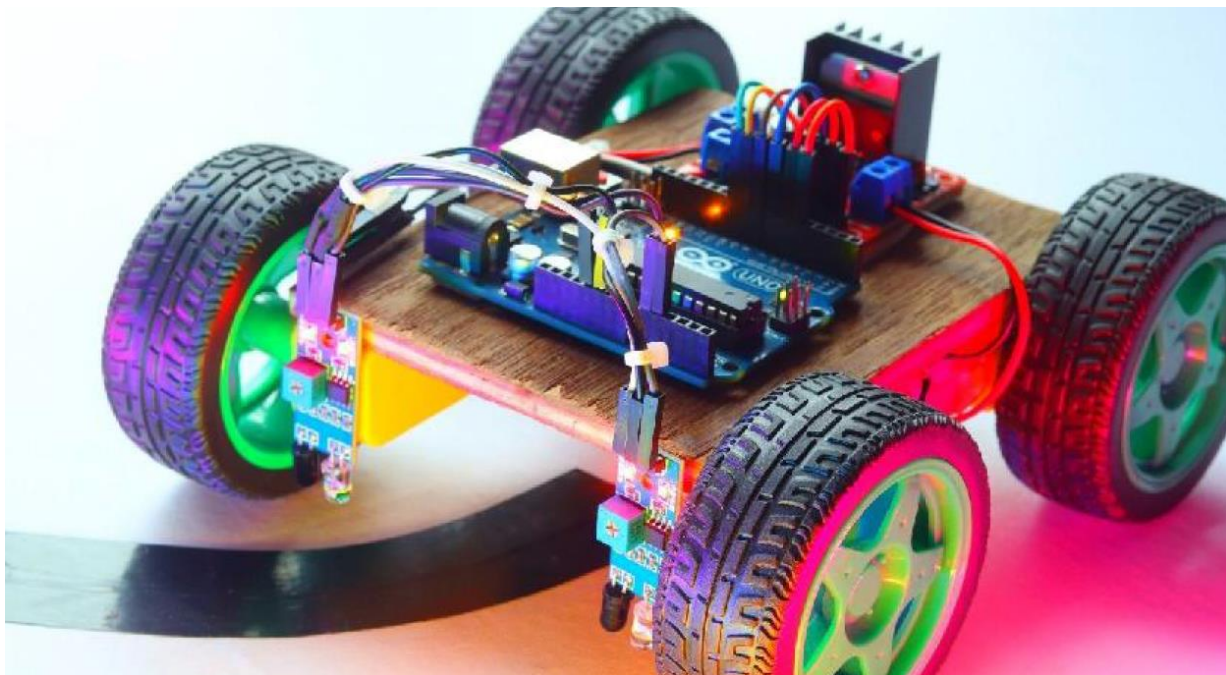
WHO CAN PARTICIPATE?

1. Atal Tinkering Laboratory (ATL) established school students only can participate.
2. Students from class VIII to XII are eligible.
3. Participants must be nominated by their respective schools.
4. A school can nominate one team with a maximum 5 students.
5. Team members may assign an innovative name for their team.
6. Each team will work under the Laboratory In-charge of ATL of their school.

“ THINGS ARE REQUIRED TO PARTICIPATE THIS EVENT (AVAILABLE IN YOUR ATL)

- Robot Chassis (Based on Availability any Design)
- Castor Wheel
- Plastic Wheel (2 Nos)
- DC Motor (2 Nos)
- IR Sensor (2 Nos)
- Motor Driver
- Arduino Uno + Usb Cable
- Jumper Wires (M-F, M-M, F-F)
- Bread Board (Large or Medium)
- Battery 9 volt (2 Nos)
- Battery Connector
- Multimeter
- Table (Surface should be Smoother, surface color should not be black or black related color)
- Minimum Table Size (width x length x height) : (60 x 100 x 1.5) cm
- Laptop Or Desktop with Speaker
- Glow Gun or Double sided Tap
- Black Tap

Prototype:



Invitation Letter:

**7th International Conference on
Advances in Control & Optimization of Dynamical Systems
(Jointly Organized by NIT Silchar and IIT Guwahati)**

**Venue: National Institute of Technology Silchar – 788010, Assam, India
22nd February – 25th February 2022**

**Chief Advisors:**

- Prof. Sivaji Bandyopadhyay, Director NIT Silchar
- Prof. T. G. Sitharam, Director IIT Guwahati

General Chairs

- Prof. Binoy Krishna Roy, NIT Silchar
- Prof. Somanath Majhi, IIT Guwahati

Program Chairs:

- Dr. Rajceeb Dey, NIT Silchar
- Prof. Bidyadhar Subudhi, IIT Goa

Technical Chairs:

- Dr. Indrani Kar, IIT Guwahati
- Prof. Chitralekha Mahanta, IIT Guwahati

Finance Chair:

- Prof. Abdul Karim Barbhiya, NIT Silchar

International Program Chair:

- Prof. Radhakant Padhi, IISC Bangalore

Local Organising Chair:

- Prof. Fazal A Talukdar, NIT Silchar

Publicity Chair:

- Prof. V.E Balas, UAV, Romania

To

The Principal/ HM,
Schools with ATL
NE Region

Date: 09/01/2022

Sub: Online workshop cum competition on a path following robot utilizing the available components in your ATL for Class – VII to Class XII students.

Dear Sir/Madam,

HAPPY NEW YEAR 2022. Congratulations, Sir/Madam, for establishing an Atal Tinkering Laboratory and thus providing a better learning environment to your students.

The Department of Electrical Engineering, NIT Silchar, jointly with the Department of Electronics and Electrical Engineering, IIT Guwahati is organizing the **7th International Conference on Advances in Control and Optimization of Dynamical Systems 2022 (ACODS 2022)** at NIT Silchar during the period 22nd February to 25th February 2022. It is our privilege to host such a mega event in North East for the first time jointly with IIT Guwahati and technically supported by seven other NITs of North East, thus extending the active participation of the entire region.

We will organize an online workshop cum competition on a path following robot utilizing the available components in your ATL. Details of the workshop are available in the attached flyer. A summary is given below.

- 12th February 2022 – a half-day hands-on workshop on “a path following robot” and announcement of the details of the competition.
- 12th February to 19th February – Build the robot for the competition; Our technical team will support the students if needed. All teams will upload their video to show the performance of the working robot.
- 23rd February 2022 – The best seven teams will present their working robot online. The three prize winners will be announced.

You are requested to encourage your student to form a team of five members from Class – VII to Class-XII and participate in the workshop and the competition by registering at the following link.

<https://forms.gle/5NsfNCkwxrpJwpCH8>

Thanking You

Yours sincerely

(Prof. Binoy Krishna Roy)

EE Dept, NIT Silchar

E-mail: bkr@ee.nits.ac.in (9435522435)

For details, visit the Conference Website: <http://acods2022.nits.ac.in/>

A few photos from the ACODS 2022 conference are attached here.



Finally, the conference concluded with a panel discussion on the theme ***“Implementation issues of National Education Policy (NEP) 2020 in the centrally Funded Technical Institutes (CFTIs) in North East Region of India”***. All Directors of CFTIs of NE region participated in the discussion. The cultural heritage and diversity, and abundant opportunities of tourism in this North eastern part of the country were showcased through the conference.

✚ **Event 2: EVCO-2022** - Summary Report on One Week Workshop titled “**Electric Vehicle: Challenges & Opportunities** (EVCO-2022)”

The above titled workshop was scheduled from 22nd to 26th August 2022, in the Department of Electrical Engineering, BIT Sindri, Dhanbad (828123), Jharkhand. The workshop was organized in Online Mode. It was delighted to have *IEEE Kolkata Section* and *ACDOS* (A National Member Organization (NMO) of the International Federation of Automatic Control (IFAC)) as technical Co-Sponsors for the event.

The event was organized under the direction of Dr. D. K. Singh, Director, BIT Sindri and Dr. Md. Abul Kalam, Head of the Department. Dr. Pankaj Rai of the department was the convener. Dr. Amit Kumar Choudhary, Mr. Praveen Kumar and Mr. Mukhlesur Rahman, Assistant Professors in the Department, were the event coordinators.

The scope of the workshop was to focus on Electric Vehicles (EVs), as they are playing a major role in reducing greenhouse gases such as carbon dioxide, methane, nitrous oxide, water vapor and chloro-fluorocarbons etc. However, the use of EVs experiences numerous challenges like long driving ranges, size, cost, charging time and many other limitations. Therefore, the solution for the above challenges is the development of advanced technologies such as charging infrastructure, battery swapping, battery management and electric vehicle power train drive systems etc. As the topic of the workshop suggests, all the known challenges were opened for their disclosure and their respective opportunities were discussed briefly during the workshop.

Specifically, the objectives of the workshop were (a) to address the challenges in the efficient design of power converters through advanced controller techniques towards electric propulsion and (b) to provide an opportunity for students, academia and industry to gain insights into electric vehicle technology.

The floated workshop brochure included the course content to be the prime focus of the workshops as: (1) Conversion of Conventional Vehicle to Electric Vehicle, (2) Essentials of Battery Systems & Battery Management System, (3) Electric Vehicle using MATLAB and Simulations, (4) Integration of Electric Vehicle to Grid, (5) Design and Optimization of EV Drive Trains etc. The speakers discussed their topic of interest related to the workshop with enthusiasm and interest.

The workshop attracted the participants from all over India. The workshop witnessed around 194 registrations and a continuous presence of around 160 participants throughout the workshop.

The workshop was decorated with eminent speakers from various arenas of Electric Vehicles both from academia and industry. The speakers from academia were (a) Dr. Akshay Kumar Rathore, Singapore Institute of Technology, Singapore; (b) Dr. Santosh Kumar Singh, IIT (BHU) Varanasi; (c) Dr. Somnath Sen Gupta, IIT Kharagpur; (d) Dr. Abhinav Saxena, JSSATE, Noida; (e) Dr. Chandan Kumar, BIT Sindri Dhanbad; (f) Dr. Vineet Shekhar, BIT Sindri Dhanbad. Followed by speakers from industry were (a) Dr. Naresh Kumar Pilli, Bosch Ltd.; (b) Dr. Naveen Kumar

Marati, Hitachi Energy and (c) Mr. Sameer Kumar Singh, OPAL RT.

Further topics such as Hydrogen Fuel Cell Electric Vehicles: Development, Opportunities and Challenges; SiC technology in Automotive industry; WBG power Converters for Electric Vehicles; Power Train Architecture of xEv's; Optimal cost minimization and charging control of Electric vehicle battery; Smart Hybrid System; Electric Vehicle Architecture Equipped with Sensors and Actuators; Energy Management of Fuel Cell Hybrid Electric Vehicles and Time Simulation for Electric and Hybrid Electric Vehicles were discussed during the workshop.

The workshop helped the audience to explore the types of EVs *i.e.*, Battery Electric Vehicles (*BEV*) and Fuel Cell Electric Vehicles (*FCE*) which were discussed on the day one. A later session elaborated on the usage of Silicon Carbide (SiC) Technology for the EVs. Day two commenced as a continuation to the earlier session discussing the comparison between the SiC and Gallium Nitrate (GaN) Technology for the EVs. The later session elaborated about the existing automotive solutions and standards for vehicle test procedures. Day three started with an overview and challenges with the conventional vehicles followed by the advantages of the EVs along with levels of hybridization in vehicle models and Smart Hybrid System. Further, day four sessions offered an insight to the EVs architecture equipped with sensors and actuators. This session was followed by the close introduction to the energy management of fuel cell hybrid EVs. As proposed, the session on the last day was fixed for industry interaction and discussed the real-time simulation for electric and hybrid EVs on the OPAL-RT platform.

The workshop concluded smoothly and successfully with extensive participation and submission of feedback. The workshop organizing committee is thankful to ACDOS for supporting the event.

A few photos from the workshop is given below:



(a) Core Committee of the Workshop along with student volunteers and a speaker

ICV vs EV

Different power transfer systems for vehicles:

- ✓ Conventional gas engine (propulsion)
- ✓ Electrical engine (propulsion)

Peak efficiency of typical gas engine is about 30%

Peak efficiency of electric propulsion motor is 95%

- ✓ Vehicle performance
- ✓ Higher Fuel economy
- ✓ Lower Emissions
- ✓ Passenger comfort
- ✓ Safety
- ✓ Flexibility

Smarter & Higher-tech

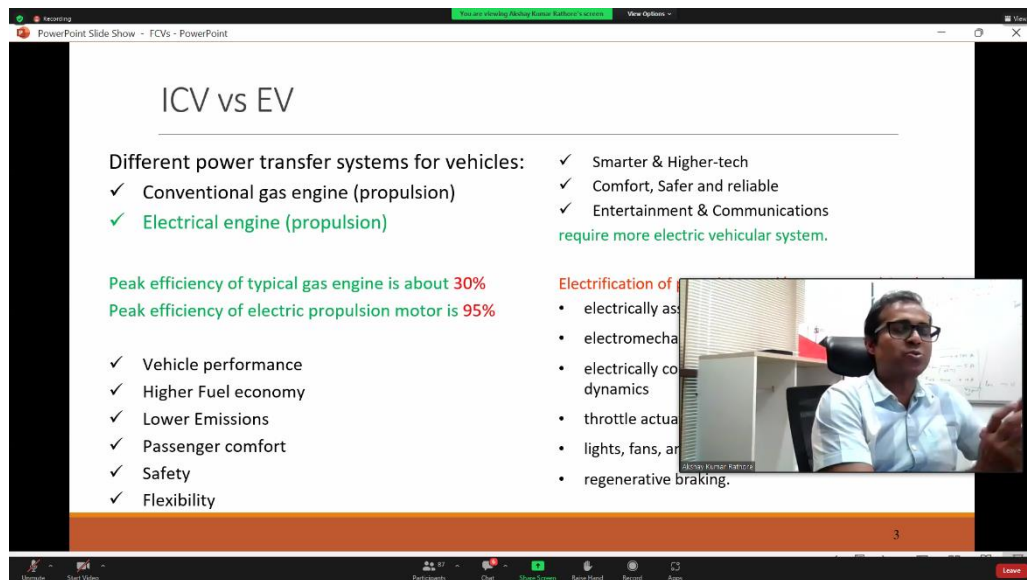
Comfort, Safer and reliable

Entertainment & Communications

require more electric vehicular system.

Electrification of

- electrically as
- electromecha
- electrically co
- dynamics
- throttle actua
- lights, fans, an
- regenerative braking.



(b) Lecture by Dr. Akshay Kumar Rathore, *SIT, Singapore.*

Project E-Fan X:

Serial Hybrid architecture

FAN adaptation: AIRBUS + Rolls-Royce

2MW Energy Store

E-supervisor HEPB

Power Distribution Centre

Generator Power Electronics

2MW Generator

AE 3007 Fan & Nacelle

AE 3100 Gas Turbine

COCKPIT HMI

Human Machine Interface

Hybrid Electric Propulsion System

AIRBUS

SIEMENS

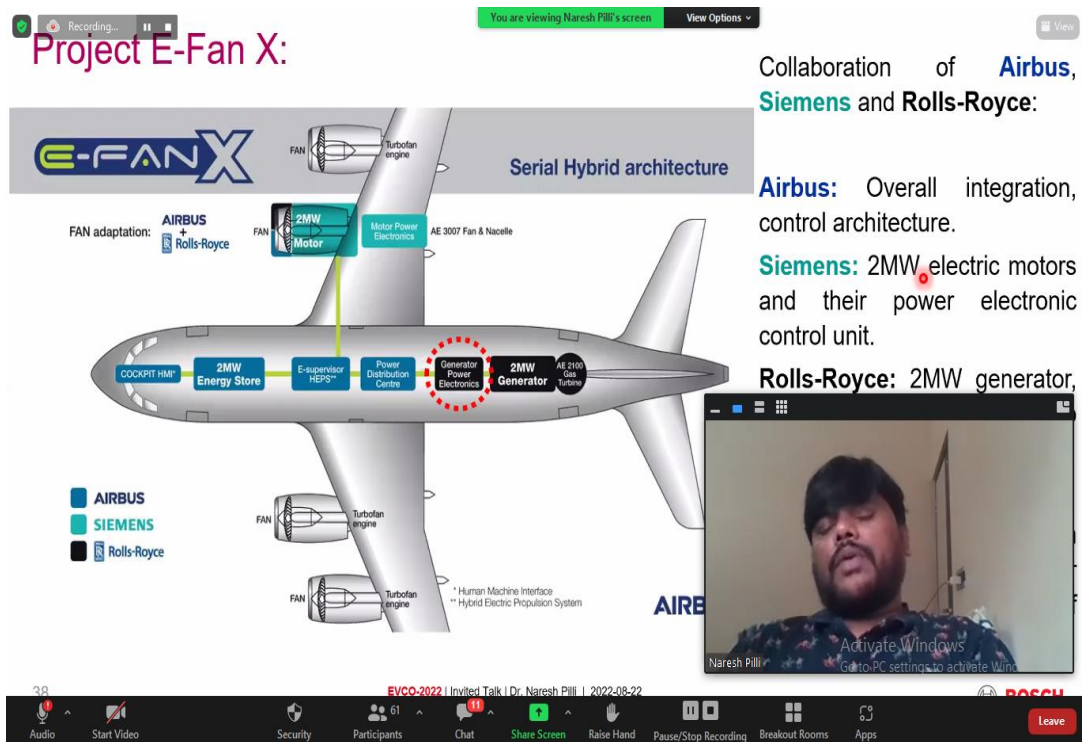
Rolls-Royce

Collaboration of Airbus, Siemens and Rolls-Royce:

Airbus: Overall integration, control architecture.

Siemens: 2MW electric motors and their power electronic control unit.

Rolls-Royce: 2MW generator,



(c) Lecture by Dr. Naresh Kumar Pilli, *Bosch Ltd.*

Recording

You are viewing Santosh K Singh's screen

View Options

View

Possible WBG

Santosh K. Singh

Wide band gap (WBG) Power devices

Silicon Carbide (SiC)
(3.3 eV)

Gallium Nitride (GaN)
(3.3 eV)

Diamond
(5.4 eV)

The Best !

Activate Windows
Go to PC settings to activate Windows.

(d) Lecture by Dr. Santosh Kumar Singh, *IIT (BHU) Varanasi*.

Levels of Hybridization : Vehicle Model

The diagram illustrates the levels of hybridization for various vehicle models, categorized into six main groups: Stop Start, Micro Hybrid, Mild Hybrid, Full Hybrid, Plug-in Hybrid, and Full Electric. Each category includes specific vehicle models and their associated power and energy storage capabilities.

Stop Start

- Valeo: 308 e-HDi 1.6 BVA
- BOSCH: Invented for life
- FIAT 500

Micro Hybrid

- MAZDA I-ELOOP

Mild Hybrid

- Continental: Mercedes S 400
- HONDA: Honda Insight

Full Hybrid

- TOYOTA: 3008 HY4, Prius

Plug-in Hybrid

- A3 e-Tron
- Prius 3
- Chevrolet VOLT 2011

Full Electric

- ZOE
- BMW i3
- BlueCar

Power and Energy Storage Capabilities

Stop & Start	Micro Hybrid	Mild Hybrid	Full Hybrid	Plug-in Hybrid	Full Electric
12 Volts 3 kW	12 - 24 V 5 kW	48 - 100 V 15 kW	> 200 V 30 - 50 kW	> 300 V 50 - 120 kW	> 300 V 50 - 120 kW
< 0.1 kWh	0.1 - 0.2 kWh	0.3 - 0.5 kWh	1 - 2 kWh	3 - 10 kWh	20 - 40 kWh

(e) Lecture by Dr. Naveen Kumar Marati, *Hitachi Energy*

Recording You are viewing Dr. Abhinav Saxena's screen View Options

BIT SINDRI.pptx - Microsoft PowerPoint

Home Insert Design Animations Slide Show Review View MathType

From Beginning From Current Slide Custom Slide Show Set Up Slide Show Hide Slide Record Narration Rehearse Timings Use Rehearsed Timings Set Up

Resolution: Use Current Resolution Show Presentation On Use Presenter View Monitors

Slides Outline

Benefits of Electric vehicle

- Electric Vehicles cause much fewer lifecycle emissions than gasoline vehicles, even after accounting for emissions during production of the vehicle. An electric vehicle in Pennsylvania emits about two thirds fewer air pollution than a comparable gasoline vehicle. As our electric grid gets cleaner, electric vehicle emissions will continue to decrease.
- Air pollution decreases our quality of life and increases rates of health conditions, such as asthma, especially among vulnerable populations such as children, elderly, and individuals that work outside. Poor air quality often disproportionately impacts minority and low income communities. Electric vehicles help to improve local air q
- Quality and improve the quality of life of individuals in your community.

Annual vehicle emissions by fuel type (12,000 miles)

Gasoline vehicle (compact/mid-size car) EV charged on grid EV charged with renewables

CO2e NOx PM

Fewer Emissions → Cleaner Air → Better Health

Activate Windows Go to PC settings to activate Windows.

Audio Start Video Security Participants 78 Chat Share Screen Raise Hand Record Breakout Rooms Apps Leave

(f) Lecture by Dr. Abhinav Saxena, JSSATE, Noida

Recording You are viewing somnath sengupta's screen View Options

POLYMER ELECTROLYTE MEMBRANE FUEL CELL

- Membrane allows positive ions to move from anode to cathode. Acts as barrier to electrons and neutral gas.
- Porous electrodes used in anode and cathode.
- Solid electrolyte, high efficiency, working temperature: 60°C-80°C – suitable for automotive purpose.
- $$E = 1.229 + \frac{\Delta S}{2F}(T - 298.15) + \frac{RT}{2F}(\ln(p_{H_2}) + \frac{1}{2} \ln(p_{O_2}))$$
- Activation polarization - Drop in voltage due to energy used for activation of reaction.
- Concentration polarization – Drop in voltage due to change in concentration of reactants

anode - cathode +

H₂ O₂ H⁺ H₂O

ion conductive membrane

U_{fc} j_{fc} [A/m²]

activation polarization ohmic polarization concentration polarization

Activate Windows Go to PC settings to activate Windows.

Audio Start Video Security Participants 70 Chat Share Screen Raise Hand Record Breakout Rooms Apps Leave

somnath sengu...
somnath sengupta

Dr. Amit Kumar...
Dr. Amit Kumar Choudh...

PRADEEP KUMA...
PRADEEP KUMAR Ver...

Rojina Hansda
Rojina Hansda

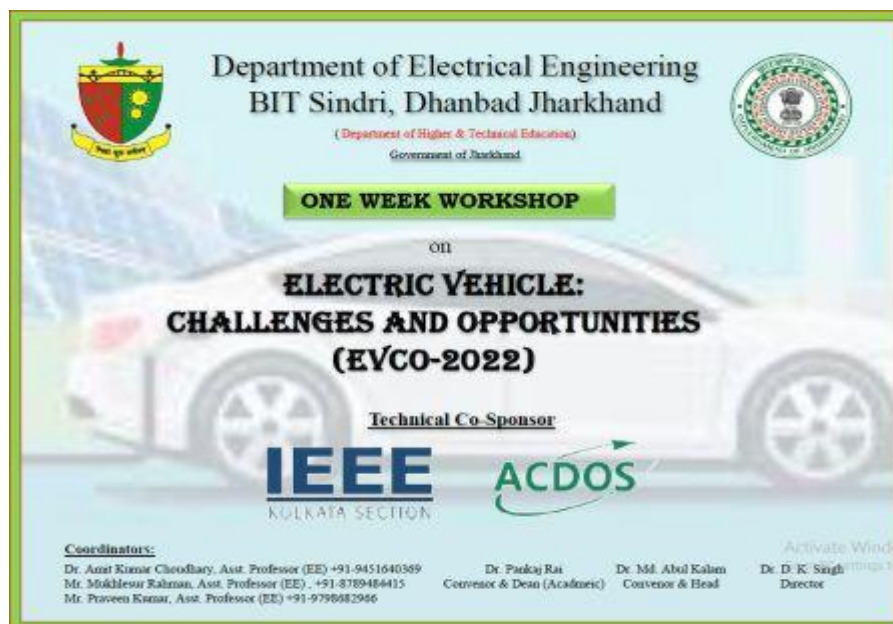
Vikash Gorai
Vikash Gorai

11:58 AM 8/25/2022

(g) Lecture by Dr. Somnath Sen Gupta, IIT Kharagpur.



(h) Lecture by Mr. Sameer Kumar Singh, OPAL RT India.



(i) Leaflet of the Workshop



ABOUT THE INSTITUTE

BIT, Sindri was started as College of Mechanical and Electrical Engineering in 1949 under the dynamic leadership of Prof. D. L. Deshpande, Director, regarded as the architect of the institute. It has a sprawling campus of about 450 acres of land near the eastern bank of river Damodar at a distance of 28Kms from Dhanbad railway station linked by rail as well as road. The institute is fully residential for students as well as teaching and non-teaching staff. The institute is administratively governed by the Department of Science and Technology, Government of Jharkhand and is academically affiliated to Jharkhand University of Technology, Ranchi. All the offered UG and PG courses are approved by AICTE and most of the undergraduate programs are accredited by the NBA.

The main aim of the institute is to provide valuable human resources for the industry and society through excellence in technical education and research for sustainable development. The college offers B.Tech courses in 10 disciplines of engineering namely Mechanical, Electrical, Metallurgy, Production & Industrial, Chemical, Electronics & Communications, Civil, Mining, Computer Science, and Information Technology. Additionally, the institute also offers M.Tech specializations and Doctorate. The college possesses modern amenities which include multimedia auditoriums, seminar rooms, class rooms, state-of-the art well-stocked rich E- library, well- equipped modern laboratories and campus wide network & state of art Siemens lab which is regarded as Centre of Excellence to meet the industry 4.0 demand.



ABOUT THE DEPARTMENT

This was the pioneer branch at the institute in 1949. The department offers 4 years B.Tech. Degree course with an annual intake of hundred students. It also offers Doctorate Degree and M.Tech. Degree course with specialization in Control System and Power System. It is also look after an electrical sub-station and maintain the distribution line of BIT campus. The department pose well equipped laboratories required in all the 3 courses. The prestigious million volt Atkinson High Tension Laboratory, first of its kind in India is under the department supervision.

VISION OF THE DEPARTMENT

To emerge as a globally recognized center in the field of Electrical Engineering to provide valuable human resource and ambience for innovative research for sustainable development of industry and society.

MISSION OF THE DEPARTMENT

- ❖ To offer state-of-the-art undergraduate, post graduate and doctorate programmes by providing a conducive environment towards outcome-based teaching learning process with knowledge and skill creation, suitable for contemporary and future needs of industry.
- ❖ To promote creative ambience in order to generate new knowledge by conducting quality research in collaboration with Electrical, Electronics and allied industries.
- ❖ To bridge the gap between industry and academia by framing curriculum and syllabi based on industrial and societal needs so that competency of the students matches the upcoming challenges in education, profession and life.
- ❖ To instill moral and ethical values among the students through holistic personality development so as to ensure human intellectual capacity to its full potential.

**ONE WEEK WORKSHOP
ON**

**ELECTRIC VEHICLE:
CHALLENGES AND OPPORTUNITIES**

(EVCO-2022)
(Virtual Mode)

22nd – 26th August, 2022




Organized by
Department of Electrical Engineering
BIT Sindri, Dhanbad
Jharkhand-828123 (INDIA)
www.bitsindri.ac.in

Technically Co-Sponsored by




(j) Brochure

Section C: Upcoming Events/Activities during 2022-23**❖ Event 1: ACDOS AGM Cum Seminar Talk - Online**

ACDOS AGM along with two virtual talks online on 29th October 2022. There will be one seminar talk:

“Birkhoff Pseudospectral Optimal Control Theory” by Prof. I. M. Ross, Naval Postgraduate School, Monterey, CA, USA

❖ Event 2: 22nd IFAC International Symposium on Automatic Control in Aerospace (ACA) 2022 to be held in IIT Bombay during 21-25 November 2022

The 22nd IFAC International Symposium on Automatic Control in Aerospace (ACA) 2022 is a core triennial event of the IFAC Technical Committee on Aerospace. The IFAC International Symposium on ACA 2022 aims to provide an opportunity to present and discuss new developments in methodologies and techniques in the general area of Guidance, Navigation and Control of Spacecraft, Aircraft, Helicopters, Launchers and UAV, Filtering, Estimation, and Identification, Fault Detection, Trajectory Design and Trajectory Optimization. Special attention will be paid to bringing researchers and practitioners in the field of aerospace together to discuss common problems of theoretical and practical applications, describe scientific and commercial applications, and explore the possibilities for future research. The IFAC International Symposium on ACA 2022 will be organized by the Indian Institute of Technology Bombay at Victor Menezes Convention Centre, IIT Bombay, Mumbai, India during 21–25 November 2022. ACA 2022 will be held in hybrid mode.

National Committee Members:

Chair: Arnab Maity, Indian Institute of Technology Bombay, Mumbai

Co-Chair: Radhakant Padhi, Indian Institute of Science, Bengaluru

Vice-Chair from Industry: Kaushik Das, Tata Consultancy Services, Bengaluru

International Committee Members:

Chair: Antonios Tsourdos, Cranfield University, UK

Co-Chair: Houria Siguerdidjane, CentraleSupélec, France

Vice-Chair from Industry: Prasiddha N Dwivedi, DRDO, India

Editor:

Bidyadhar Subudhi, IIT Goa, Goa

Scope of the conference:

Focusing on aerospace applications, the symposium will cover all aspects of dynamics, navigation, guidance and control in astronautics and aeronautics, ranging from theoretical studies to industrial applications. It will include navigation, guidance and control of aircraft, helicopters, missiles, satellites and probes, ELV and RLV launchers. Autonomous, intelligent, unmanned and networked are keywords for



rapidly evolving fields of aerospace systems. Particularly, cooperative/ distributed control for multiple air/space vehicles including formation flight and air traffic control is a hot topic. Space exploration and transportation to planets, satellites, comets, asteroids, etc., is a typical application field of automatic control. In addition, forthcoming trends, perspectives and future research projects are welcome, as well as current projects and technologies.

Snapshot of Call for Papers:



**22nd IFAC International Symposium on
AUTOMATIC CONTROL IN AEROSPACE (ACA) 2022**
Organized by
Indian Institute of Technology Bombay, Mumbai, India
21-25 November 2022







Committees

National Organizing Committee

Chair: Arnab Maity, Indian Institute of Technology Bombay, Mumbai

Co-Chair: Radhakant Padhi, Indian Institute of Science, Bengaluru

Vice-Chair from Industry: Kaushik Das, Tata Consultancy Services, Ben-

International Program Committee

Chair: Antonios Tsourdos, Cranfield University, UK

Co-Chair: Houria Siguerdidjane, CentraleSupélec, France

Vice-Chair from Industry: Prasiddha N Dwivedi, Defence Research and Development Organization, India

Background

The 22nd IFAC International Symposium on Automatic Control in Aerospace (ACA) 2022 will be held at Victor Menezes Convention Centre (VMCC), Indian Institute of Technology Bombay, Mumbai, India during 21-25 November 2022. Some of past symposia took place in Cranfield (UK, 2019), Sherbrooke (Canada, 2016), Würzburg (Germany, 2013), Nara (Japan, 2010), Toulouse (France, 2007), Saint Petersburg (Russia, 2004). The special emphasis of this year's symposium will be on favouring the participation of students with a reduced registration fee and three student best-paper awards.

Schedule

Regular Paper Submission Deadline	31 July 2022 (Final)
Invited Paper Submission Deadline	31 July 2022 (Final)
Workshop/Tutorial Submission Deadline	15 August 2022
Invited Session Proposal Submission Deadline	30 June 2022
Acceptance/Rejection	15 September 2022
Final Submission Deadline	10 October 2022
Early Registration Deadline	31 October 2022

Section D: ACDOS Budget

The following are the details of ACDOS 2021-2022 budget approved by auditor Hiranmayi Nitish and Company



Hiranmayi Nitish & Co

J Nitish +91 98455 22652 | Hiranmayi Vinay +91 98452 36440

CHARTERED ACCOUNTANTS

To:

The Members,
Automatic Control and Dynamic Optimization Society,
31/2, 4th Cross, 6th Main Road,
Mathikere Extension,
Bangalore-560054

1. We have examined the Balance sheet of Automatic Control and Dynamic Optimization Society, Bangalore, as on 31st March 2022 and The Income and Expenditure account for the period 01-04-2021 to 31-03-2022. These financial statements are the responsibility of the management. My responsibility is to express opinion on these financial statements based on our audit.
2. We conducted the audit in accordance with standards on auditing issued by the Institute of Chartered Accountants of India. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement. An audit includes examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements. An audit also includes assessing the accounting principles used and significant estimates made by management, as well as evaluating the overall financial statement presentation. We believe that our audit provides a reasonable basis for our opinion.
3. We have obtained all the information and explanations, to the best of our knowledge and belief that were necessary for the purpose of audit. In our opinion, proper books of account have been maintained by the Society as far as appears from our examination of the books.
4. In Our opinion and to the best of our information and according to information given to us, the said accounts give a true and fair view.
 - i. In the case of the Balance Sheet, of the state of affairs of the above named society as on 31st March 2022 and
 - ii. In the case of the Income & Expenditure Account, of the excess of Income over Expenditure for period 01-04-2021 to 31-03-2022.

For HIRANMAYI NITISH & CO
Chartered Accountants
FRN. 0119185



HIRANMAYI VINAY
(PARTNER)
MRN.206173
UDIN- 22206173AXZADS3896
Place: Bangalore
Date: 28/09/2022



CONFIDENTIAL

Hiranmayi Nitish & Co No.286, 1st floor 2nd Main Road, Between 17th & 18th Cross Sampige Road Malleshwaram
Bangalore 560 003 Phone 080 4205 0246 | 4128 0000 email info@cahnco.com | www.cahnco.com

AUTOMATIC CONTROL AND DYNAMIC OPTIMIZATION SOCIETY
INCOME AND EXPENDITURE ACCOUNT FOR THE PERIOD 01-04-2021 To 31-03-2022

Amount 2020-21	Expenditure	Amount 2021-22	Amount 2020-21	Income	Amount 2021-22
1,30,000	Salary to secretary	1,44,000	1,04,883	Interest on FD	1,25,369
36,000	Rent	36,000	2,000	ACDOS Membership fees	-
2,500	Profession Tax paid	-	32,771	Savings Bank Interest	4,889
1,454	Other Expenses	-		ACDOS- 2020	3,39,618
54	BSNL Phone bill	-			
2,000	Printing and Stationery	2,540			
13,320	Professional fees	12,140			
15,000	Audit Fees	15,000			
86,151	Awards to student	-			
58,400	Website maintainance	25,000			
67,499	Subscription fees	1,28,685			
2,775	Bank Charges	1,415			
1,675	Rates and Taxes	1,500			
8,550	GST payment	-			
1,752	Office Expenses	-			
-2,87,475.50	Excess of income over Expenditure	1,03,596			
1,39,654		4,69,876	1,39,654		4,69,876

For Hiranmayi Nitish & Co
Chartered Accountants


HIRANMAYI VINAY
(Partner)
Membership No. 206173

Place: Bangalore
Date: 28-09-2022
UDIN:



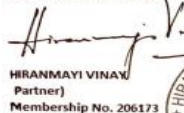
For AUTOMATIC CONTROL AND DYNAMIC OPTIMIZATION SOCIETY


TREASURER
Automatic Control and Dynamic
Optimization Society

AUTOMATIC CONTROL AND DYNAMIC OPTIMIZATION SOCIETY
Balance Sheet as on 31-03-2022

31-03-2021	LIABILITIES		31-03-2022	31-03-2021	ASSETS	31-03-2022
28,44,131	Fund Account:				Current Asset Loans & Advances	
-2,87,476	Opening Balance	25,56,655	25,39,489	2,06,417	Cash with Bank	
	Add: Excess of Income over Expenditure	1,03,596		23,12,367	Savings account	65,382
	Less: Income Tax paid	1,20,762			FD With Canara bank	24,25,199
25,56,655	Closing balance			7,398	Cash in hand	5,898
					Advances ,Deposits and Receivables	
	Current Liabilities and Provisions			10,000	Rent Deposit	10,000
15,000	Audit fees payable		15,000	7,428	TDS receivable 2020-21	7,428
				28,045	TDS receivable 2019-20	28,045
				-	TDS receivable 2021-22	12,537
25,71,655	Total		25,54,489	25,71,655	Total	25,54,489

For Hiranmayi Nitish & Co
Chartered Accountants


HIRANMAYI VINAY
(Partner)
Membership No. 206173

Place: Bangalore
Date: 28-09-2022



For AUTOMATIC CONTROL AND DYNAMIC OPTIMIZATION SOCIETY


TREASURER
Automatic Control and Dynamic
Optimization Society

This brings an end to the Annual Report 2021—2022. Thanking all the members for their support and wishing everyone a fruitful year ahead.

Arnab Maity

Dr. Arnab Maity

General Secretary, ACDOS



Automatic Control & Dynamic Optimization Society
Indian National Member Organization of
INTERNATIONAL FEDERATION OF AUTOMATIC CONTROL

