

ABOUT WORKSHOP

Present machinery and structural condition monitoring systems depend on human expertise and measurement accuracies. However, the modern trend all over the world has been changed towards implementation of Artificial Intelligence techniques for diagnostics and control. In condition monitoring, various types of signals including sound, vibration, temperature etc. are utilized and the raw data after processing can be easily fed to the AI tools for further interpretation. Today's developments in machine learning towards, deep learning tools have opened several arenas in direct analysis of condition monitoring. Earlier condition monitoring systems were based on various heuristics and statistical concepts. The so called predictive maintenance strategies require updates from time to time. The signal processing techniques are part of the study and modern engineers should acquaint the basic knowledge of signal processing and AI tools using software such as Matlab and LabVIEW.

The objective of this workshop is to bring together final year master students and active researchers from various fields of Engineering and introduce some major advances in the field of applied Artificial Intelligence in machine condition monitoring using Matlab and LabVIEW, with special emphasis on hands-on training with these software. By the end of the program, the participants acquire proficiency in applying various kinds of machine learning and knowledge based algorithms for given kind of applications like classifications and regressions. The workshop improves the knowledge of the participants and provides a platform to interact with experts to conduct research activities in the fields of AI based condition monitoring for modern industrial sector.

CONTACT DETAILS

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Support Team for Further Assistance:

Mr. Subhransu Kumar Panda

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ELIGIBILITY CRITERIA FOR PARTICIPANTS

- The proposed workshop is meant to support motivated PG and Ph.D. level students, who are having a strong willingness to get excellence in their scientific and engineering research pursuits in the area of joining and analysis of materials.
- The applicants must produce a letter of authentication from their Supervisor/Head of the Department/Head of the Institute indicating their association with the institute and "No Objection Certificate (NOC)" for allowing their student to undergo training in the workshop, if selected. There is no dedicated format for the same; however, it must be obtained on the institute/university letter head.
- The course will be completely free of cost.
- Maximum number of participants is limited to 25.
- All the selected participants will be given accommodation in Institute hostel with catering facilities.
- The participants will be eligible for TA reimbursement for their journey to the host institute from their home institute, both ways, as per the GoI norms.
- A certificate regarding successful completion of workshop shall be issued to the participants.
- More details can be found in Accelerate Vigyan website
- Participants interested to attend this program should register online in the below mentioned link or QR code:

<https://forms.gle/3zbxsbANjsYtMHCb6>

- The candidates must provide valid E-mail IDs while doing the online registration.
- The selected candidates will have to acknowledge and accept the offer for participating in the workshop through return email, failing which the waitlisted candidates may be called for the workshop.
- There are guest house and hostel accommodations.



SERB Sponsored
One Week High-End Workshop
on
Artificial Intelligence
Techniques for Machinery
Condition Monitoring
(using Matlab and LabVIEW)
(Physical Mode)
9th Jan 2023 – 15th Jan 2023



Organized by:



Department of Mechanical Engineering
NIT, Rourkela-769008
Website: www.nitrkl.ac.in

TECHNICAL TOPICS TO BE COVERED

The Seven-day workshop on “Artificial Intelligence Techniques for machinery condition Monitoring” primarily aims to cover the following topics.

- ❖ Fundamentals of condition monitoring techniques.
- ❖ Basic types of signals and signal processing.
- ❖ Conventional methods of monitoring.
- ❖ Basic AI tools used in condition monitoring.
- ❖ Applications and case studies of the AI tools in condition monitoring and control of machinery.

The course content will be delivered from a pool of resource persons on the subject from leading prestigious academic institutions including IITs, NITs.

ABOUT KARYASHALA SCHEME

SERB has a vision to position science and technology as the fulcrum for social and economic change by supporting competitive, relevant and quality scientific research and development. As the premier national research funding agency, the mission is to raise the quality and footprint of Indian science and engineering to the highest global levels in an accelerated mode, through calibrated, competitive support of research and development.

‘KARYASHALA’ is an effort to improve research productivity of promising PG and PhD students from universities and colleges through high-end workshops on specific themes. This program aims to provide opportunities to acquire specialized research skills.

ABOUT THE INSTITUTE

National Institute of Technology Rourkela is an Institute of national importance created under the act of parliament. NIT Rourkela has been ranked as 225 and 31th position in QS Asia University and QS Indian University Ranking 2021, respectively. It has also been ranked in 121st position in QS BRICS category, 2020. Times Higher Education has figured NIT Rourkela in the group of 801-1000 in World University Ranking 2022. The institute provides quality education in a diverse and multicultural environment. The mission of the institute is to become an internationally acclaimed institution of higher learning that will serve as a source of knowledge and expertise for the society and be a preferred destination for undergraduate and post graduate studies. The institute is offering undergraduate, post graduate and PhD programs in 21 branches of Engineering. The departments are engaged in consultancy and research activities of several government bodies such as DST, DAE, CSIR, DRDO, BARC, ISRO and private industries. The campus has green and beautiful gardens.

ABOUT THE DEPARTMENT

The Mechanical Engineering Department is well known for teaching and research activities. The main research works are on the Industrial vibrations and condition monitoring, robotics, CAD/CAM, precision engineering, Metal forming, manufacturing, CFD, Industrial refrigeration and Cryogenics. Both core and interdisciplinary topics are included in curriculum. The department at present has over two hundred research scholars pursuing projects on diverse fields. The faculty specializations are organized under three divisions: Machine design and analysis, Production Engineering and Thermal Engineering. There are four PG specializations including industrial cryogenics. The department has well equipped laboratories for both PG classes and research works. Department has at present 31 faculty members and around 100 PG students in all four specializations. The department organizes several short term courses, conferences as well as student level programs through-out the year. It has dedicated computer center with licensed software and a workshop for fabrication works.

APPLICATION FORMAT

SERB Sponsored
One Week High-End Workshop on
Artificial Intelligence Techniques for
Machinery Condition Monitoring
(9th-15th January 2023)

1. Name:
2. Address:
3. E-mail:
4. Phone number:
5. Present course of study & Year:
6. Research interests:
7. Accommodation reqd. from ____ to ____
8. Authentication letter from HOD (enclosed)
9. Google form filled (Yes/No)

Signature

NB: Last date for filling form: 28th Dec 2022

ORGANIZING TEAM

Patron

Prof. K. Umamaheshwar Rao
Hon. Director, NIT Rourkela

Chairman

Prof. Susanta Kumar Sahoo
HOD, Mechanical Engineering, NIT-Rourkela

Coordinators

Prof. J. Srinivas & Prof. P.S. Balaji
Department of Mechanical Engineering,
NIT-Rourkela



SERB Sponsored

One Week High-End Workshop on

Artificial Intelligence Techniques for Machinery Condition Monitoring

(Physical Mode)

9th Jan 2023 – 15th Jan 2023

No Objection Certificate from the Head of the Department

This is to certify that:

1. Dr./ Mr. / Ms. / Mrs. _____, is a bonafide student of our University / Institute / College and will assume full responsibility for actively participating in the Training and Skill Internship on “**Artificial Intelligence Techniques for Machinery Condition Monitoring**” sponsored by SERB under the Accelerate Vigyan Scheme, and organized by NIT Rourkela from 9th Jan 2023 to 15th Jan, 2023.
2. The Applicant is a Full-time / part-time student of our University/ Institute/ College and enrolled in Ph.D/ Master’s Programme in Department.
3. The candidate has secured _____% / CGPA till date (if applicable).
4. The University/ Institute/ College also endorses the conduct of the applicant to be of highest order who bears a good moral character.
5. The University/ Institute/ College has “No-Objection” for the candidate participation during the above said period.
6. The candidate, if selected for participation, shall be duly permitted to attend the Training and Skill Internship on physical mode. The University/ Institute/ College may provide the necessary facilitation needed for this purpose.

Date

Signature and seal with name

(Head of the Department)