



Dear Friends,

Greetings from IIT Bombay!

I hope you had a great start to 2021!

January was marked by the beginning of the online Spring semester on the 6th, with a new glimmer of hope, of nearing normalcy, as the vaccine hit the market. I am delighted to inform you that the recipients of Distinguished Alumnus Award (DAA) 2021 and Young Alumni Achiever Award (YAAA) 2021 were announced on January 26. We would like to thank you for the nominations sent by you for the awards. The committee has selected the following Alumni for the awards,

Distinguished Alumnus Award 2021:

- Mr. Sunil Shenoy - B. Tech., 1980, Electrical Engineering
- Mr. Subramanian Sarma - M. Tech., 1981, Chemical Engineering
- Dr. Pandurang Nayak – B. Tech., 1985, Computer Science & Engineering
- Dr. Harrick Vin - B.Tech., 1987, Computer Science & Engineering
- Mr. Ramesh Mangaleswaran - B. Tech., 1989, Metallurgical Engg. & Materials Science
- Mr. Sharad Sanghi- B. Tech., 1989, Electrical Engineering
- Prof. Kavita Bala - B. Tech., 1992, Computer Science & Engineering
- Prof. Vikram Deshpande - B.Tech., 1994, Mechanical Engineering
- Prof. Govindasamy Mugesh – Ph. D., 1999, Chemistry
- Prof. Devavrat Shah – B. Tech., 1999, Computer Science & Engineering

Young Alumni Achiever Award 2021:

- Prof. Zubin Jacob - B. Tech., 2004, Electrical Engineering
- Mr. Akhil Gupta – Dual Degree (B. Tech. + M. Tech.), 2005, Chemical Engineering
- Mr. Gaurav Porwal - Dual Degree (B. Tech. + M. Tech.), 2005, Chemical Engineering
- Mr. Mohit Soni - Dual Degree (B. Tech. + M. Tech.), 2005, Electrical Engineering
- Prof. Yashodhan Kanoria - B. Tech., 2007, Electrical Engineering

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News from IIT Bombay



Alumni Initiatives - Centre for Policy Studies

The Centre was set up in 2016 to provide a fillip to the study of Public Policy. The Policy Studies is a relatively nascent discipline in India. Given the increasing complexities of the economy, international relations, technology, and governance, it is imperative that this discipline takes firm roots in our polity and society. The academic community has an important role to play in this regard. In setting up this Centre, we hope to make useful contributions to the field of Policy Studies.

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Faculty Research at IIT Bombay

"It is challenging to teach a computer, the art of task decomposition"

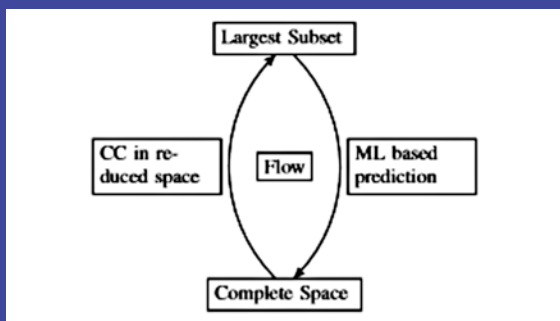
Soumen Chakrabarti is an Indian computer scientist and professor in the Department of Computer Science and Engineering at IIT Bombay. He is known for his work on,

- The CLEVER Web page ranking system based on hyperlinks, related to PageRank.
- Focused crawlers, which are Web crawlers guided by page topic classifiers.
- Keyword search on graph databases, later popularized by Facebook graph search.
- Named entity disambiguation in Web text.



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Student Research activities at IIT Bombay

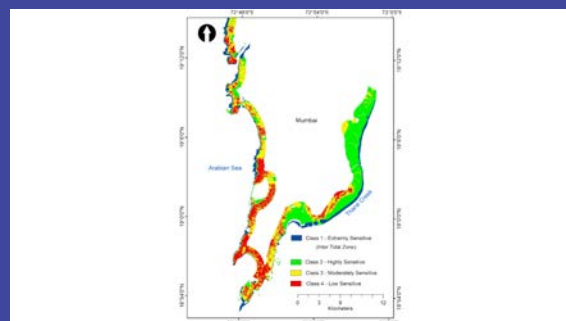


Coupled Cluster theory, Non-linear Dynamics, Machine Learning and Synergetics

Name: Valay Agarawal | **Guide:** Prof. Rahul Maitra | **Department:** Chemistry (M.Sc.)

The iteration scheme associated with single reference coupled cluster theory has been analysed using nonlinear dynamics. The solutions to the iterative scheme have been shown to follow the non-linear dynamics principle under perturbation. The period doubling cascade of the solutions, followed by chaotic regime has been recovered, along with recovery of accurate value of the Feigenbaum constant to high accuracy. The novelty of the work lies in exploiting the non-linear nature of the Coupled Cluster equations. The work also includes aspects of machine learning, & the saving in computational costs.

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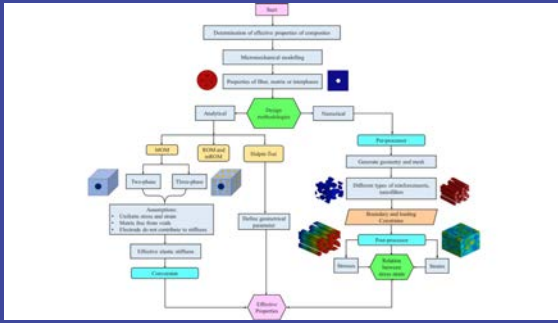


Geospatial approaches for land-use planning of coastal urban regions

Name: Dr. Ravinder Dhiman | **Guide:** Prof. Pradip Kalbar | **Department:** Centre for Urban Science and Engineering (Ph.D.)

Coastal cities are witnessing unprecedented growth caused by urbanization & industrialization. This uncontrolled growth exerts enormous stress on natural resources of coastal regions. Therefore, land-use planning of the coastal zones is a priority issue with regard to coastal zone management & sustainable development. Coastal Regulation Zone (CRZ) guidelines are currently being practiced for the management of the Indian coastal zone. In this research work, the issues related to current CRZ practices were identified through expert surveys as well as from the literature.

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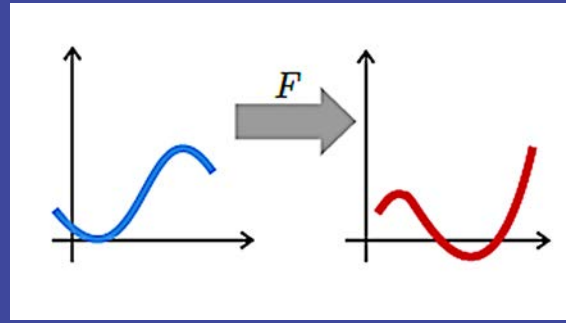


Probing the prediction of piezoelectric properties for graphene-based composites

Name: Dr. Kishor Shingare | **Guide:** Prof. Susmita Naskar | **Department:** Aerospace Engineering (Post-Doctoral Fellow)

In the twenty-first century, graphene is considered as one of the most striking 2D material to form next generation micro and nano-electromechanical systems due to its unique multifunctional properties with size-dependent physical structure. Owing to its remarkable electro-thermo-mechanical properties such as high Young's modulus (~ 1.1 TPa), electrical conductivity (~ 6000 S/cm), thermal conductivity (~ 5000 W/m/K) and scale-dependent electronic properties, graphene fascinated rigorous research interests. Hence, with the rapid use of graphene in nanocomposite structures, it becomes important to investigate its effective piezoelectric properties and its use in different energy harvesters for illustrating various global responses in future.

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Learning with Operator-valued Kernels in Reproducing Kernel Krein Spaces

Name: Akash Saha | **Guide:** Prof. P. Balamurugan | **Department:** Industrial Engineering & Operations Research (Ph.D.)

A functional regression problem is based on learning a function F , of the form $F: x \rightarrow y$, mapping an input from an appropriate input space x to a function which belongs to a space of functions denoted as y . Functional regression problems find applications in audio-visual tasks and weather forecasting, etc. Scalar-valued kernels have been popular tools for machine learning tasks where input elements (e.g. vectors) from the input space X need to be compared. In scalar valued kernel setting, a pair of inputs u, v , is mapped to a real-number $k(u, v)$. Every scalar-valued kernel can further be associated in a one-to-one manner with a reproducing kernel Hilbert space (RKHS), which simplifies the task of obtaining a relationship between the inputs.

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