

REGISTRATION FORM

DST Sponsored SERC School on
Applications of Novel Artificial Intelligence
and Machine Learning Techniques for Chemical
and Petrochemical Industries
December 28, 2009 – January 2, 2010

Name (Print): _____

Gender: M / F Age: _____ Yrs.

Designation: _____

Affiliation: _____

Mailing Address: _____

Telephone: _____ FAX: _____

Email: _____

Qualification (highest Degree): _____

Discipline: _____ Experience: _____ Years.

Broad area of work Teaching /Research / Industry experience:
(attach a list of publications)

Familiarity / Proficiency:

Mathematics: HIGH / MEDIUM

Computer programming: HIGH / MEDIUM

Numerical Methods: HIGH / MEDIUM

Internet/Web Browsing: HIGH / MEDIUM

Academic Research Institution Certificate attached:

YES / NO

Accommodation Required Yes No

Registration/Commitment Fees (DD in favor of "Centre for
Development of Advanced Computing ", Payable at Pune)

D.D. No.: _____ Dated: _____

Rs _____

Bank Name _____

Date: _____ Signature of the Applicant

Place: _____

School Organization

The course will be for six days organized in eleven sessions. The morning sessions would be mainly lectures, which would give a perspective view of the area. Afternoon sessions would have hands-on and working group methods as well as presentation of case studies. More emphasis would be given on hands-on so that participants gain better understanding of the topics covered.

Course Material

Lecture notes and appropriate reference material would be given to all the participants.

School Fee

The proposed school is free for teachers from academic institutes and researchers from various Government aided research institutions. Lunch and tea will be provided free of cost on all the course days. Applicants from academic institutions and Government funded laboratories must provide an official certificate from their institute. They will also be provided 3 tier A/C return rail fare by shortest route from the place of work on production of original tickets/receipts. Although the course is free for teachers from academia and scientists from Government funded R & D laboratories, a commitment fee of Rs. 2000/- must be paid in advance which shall be refunded upon attending the course.

Fee per participant from industry would be Rs. 6000/-

Registration

The interested participants are requested to fill in the registration form and send it along with a demand draft drawn in favour of "Centre For Development of Advanced Computing" payable at Pune towards the registration/commitment fee to the address given below. Due to limited number of available seats, registration would be done on the "first come first served" basis and fulfilling the prerequisites.

Deadline for Registration: 15 Nov 2009

Selected participants would be informed by 20 November 2009

Dates and Venue

The School will be held during 28th December to 2nd January 2010 at Maharashtra Institute of Technology, Pune. The participants are requested to report at MIT, Paud Road, Kothrud, Pune, Maharashtra 411038. Tel: 020 30273459

Contact Details:

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WEB URL: www.cdac.in/serc2009

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**Applications of Novel Artificial Intelligence
and Machine Learning
Techniques for Chemical and
Petrochemical Industries**
December 28, 2009 – January 2, 2010

Jointly organized by
Centre for Development of Advanced Computing, Pune
Maharashtra Institute of Technology, Pune

E-MAIL: serc2009@cdac.in
WEB URL: <http://cdac.in/html/events/serc/serc2009.asp>



Coordinators:

Jayaraman V.K. C-DAC, & MIT Pune
Sundararajan V. C-DAC, Pune

About C-DAC

Centre for Development of Advanced Computing (C-DAC) as a premier initiative of the Department of Information Technology (DIT), Ministry of Communications and Information Technology (MC&IT), Government of India embodies the national spirit of indigenous high-end research and development of state-of-the-art technologies and solutions. To proliferate the inherent benefits of Information Technology towards the advancement of its citizens as well as society, C-DAC has mobilized its indigenous human and technical resources towards the design, development and deployment of electronics and advanced Information Technology (IT) products and solutions.

About MIT

Maharashtra Institute of Technology (MIT) is among the first few engineering colleges established by the private sector in Maharashtra and is the flagship institution of Maharashtra Academy of Engineering and Educational Research (MAEER). Today, MIT offers under graduate engineering studies in nine disciplines: Civil, Mechanical, Mechanical (Sandwich), Electronics & Telecommunication, Computer, Information Technology, Petroleum, Petro-Chemical, Polymer and post-graduate studies in five areas: Civil structures, electronics, Polymers and Petroleum, along with industry specific, technology-oriented courses.

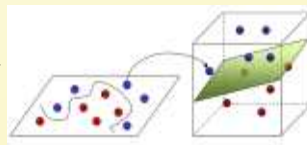
About SERC

The Science and Engineering Research Council (SERC) is an apex body through which the Department of Science and Technology (DST), government of India, implements its programmes related to promoting and encouraging research in newly emerging/advanced and challenging areas of science and engineering. The SERC also sponsors state-of-the-art courses in engineering and science for the benefit of faculty of engineering colleges, as well as scientists and engineers working in industry, R & D organizations, CSIR laboratories, and Government Departments in the country. These courses offer an opportunity for increasing interaction between industry, academia and R & D organizations

About the School

Artificial Intelligence and Machine learning are now being increasingly employed in several process industries including petroleum and petrochemical industries. These techniques are used for global optimization of reactors, unit operations and processes, for data driven modeling and several other tasks. These techniques enable the solution and implementation of large-scale real-life industrial problems, which were hitherto, not easily solvable.

The proposed SERC School aims to cover the fundamentals of a) evolutionary optimization b) classification and regression techniques employing novel machine learning paradigms like SVM and Random forests techniques for chemical engineers, using a tutorial approach all through. A few case studies (based on recent research) on the optimization of industrial systems and on data driven modeling will be covered. In addition, application of these techniques to multi-objective optimization of a phthalic anhydride reactor, a heat exchanger network, and a pressure swing adsorption unit, online fault detection, dynamic optimization of reactors, data driven modeling of various processes will be covered.



This should be useful for the participants in their teaching, and should also help them in undertaking research on challenging industrial problems.

Scope of the School

The school will introduce Machine learning and Pattern Evolution algorithms:

1. The Machine learning methods would include Support Vector Machines and Random Forests, Kernel Methods.
2. The Pattern Evolution Methods would include Genetic Algorithms (GA), Ant Colony System (ACS), Simulated Annealing (SA) and allied methods.

There would be pedagogic lectures to deal with each method along with important case studies for illustration. This will be well complemented with the hands-on sessions to demonstrate these techniques.

Case Studies

Apart from lectures there will be discussions on case studies, which include, but not restricted to, the following list:

- Multi-objective optimization of a phthalic anhydride reactor
- Optimization of a heat exchanger network,
- Optimization of a pressure swing adsorption unit
- Online Fault Detection
- Dynamic Optimization of Petrochemical & Bio Reactors
- Data driven modelling of various unit operations & Processes
- Identification of regimes of operations
- QSPR

Faculty

Name	Affiliation	Topic
Prof. Santosh K. Gupta	IIT Bombay	SA, GA & Applications
Dr. Shrikant Butt	ABB, Bangalore	SA, GA & Applications
Dr. Abhijit Kulkarni	SAS Softwares, Pune	SVM Regression & Kernel Methods
Dr. Jayaraman V.K.	MIT & C-DAC, Pune	SVM, ACS and their applications
Dr. Sundararajan V.	C-DAC, Pune	Parallel GA

Who will Benefit

The school would be beneficial to:

Young faculty, Research Scientists in the Chemical, Petroleum or Petrochemical Engineering who are working in Academic Institutions and Government Research Laboratories and Practicing Scientists in the Industries.

Prerequisite

Graduation in Chemical, petroleum or Petrochemical engineering or a higher degree with proven interest in research. At least few years of practicing experience in computer programming is essential.