

Background

The current energy market is dominated by large power plants and utilities, with central power generation, transmission and well-regulated distribution. In the near future, as more and more decentralised renewable sources of energy are deployed and connected (i.e. the Smart Grid), markets are going to change.

This workshop will explore the potential of a distributed approach to self-optimisation and self-healing in the new energy market in which the new electricity grid, the Smart Grid, is of crucial importance. The approach is based on 'dynamic clustering', that has the potential to allow large-scale Distributed Energy Resource (DER) systems to reorganize them so as to make more optimal use of their resources based on dynamic clustering in grids, to reduce the complexity of high-speed Supply / Demand (S/D) matching and the cost of smart grid management. With such cost-effective solutions, a reduction of energy losses due to unbalanced S/D, and a smooth and fast incorporation of durable energy in the grid, can be acquired supporting self-healing and self-optimisation of essential elements of the Smart Grid.

Agents negotiate service level agreements (SLAs) for cluster participation. The framework to be discussed includes: agent models for resource consumers and resource providers; clustering algorithms as the basis for coordination: criteria and objectives; market mechanisms and negotiation strategies for cluster formation/ reconfiguration; effective forecasting tool.

Objective

The main objective of this workshop is share the knowledge gained during the NWO-DST project. The participants will be familiarized with the recent works done at IIT Kanpur, IIT Delhi, TU Delft and CWI Netherlands. The following research questions are to be addressed in this project.

- Which knowledge and abilities (e.g. matching functions) about devices (and users) and their forecasted supply-demand do agents need to have to be able to match with other device agents? And how should these be represented in profiles with limited complexity?
- How do we customise the forecasting techniques according to the type of distributed energy resource?
- Which clustering criteria and boundaries are most effective in which conditions?
- Which market mechanisms are most effective for decentralized and adaptive clustering, when only local knowledge about S/D profiles is available, to efficiently reduce uncertainty in the electricity S/D?

Speakers

Various topics will be covered by the following speakers.

- Dr SN Singh, IIT Kanpur
- Dr AR Abhyankar, IIT Delhi
- Dr SC Srivastava, IIT Kanpur
- Dr Frances Brazier, TU Delft, Netherland
- Dr Han La Poutre, CWI, Netherlands
- Dr Martijn Warnier, TU Delft, Netherland
- Research Scholars of IITK, IITD, TUD & CWI

Nomination Form

International Workshop
On

Agent Based Self-Healing Energy Systems: Design and Implementation

February 21-22, 2017, IIT Kanpur

Name: _____

Designation: _____

Qualification: _____

Organization: _____

Gender (for accommodation): M F

Accommodation required: Yes No

Correspondence Address: _____

_____ PIN: _____

Phone: _____ Fax: _____

E-mail: _____

Category

- Academic Institution Utility
 Industry R&D organization

(Signature of Participant)

Forwarded

(Head of the Institution/Department)
Signature with seal

Nomination & Workshop Registration

Nominations are invited from the academic Institutes, R&D organizations, power utilities and industries for attending this two day workshop at IIT Kanpur. The filled up nomination form duly signed by the Head of the Organization or Unit, giving details of the person attending the workshop, should reach us latest by 25th January 2017. There is no registration charge to attend the conference. However, the participants have to bear their travel, lodging and boarding charges. The accommodation in the Visitors' Hostel (Guest House) at IIT Kanpur is available on sharing basis. The participants must indicate in case they want to stay in the Visitors' Hostel in their nomination form.

Schedule and Venue

The workshop will be held during February 21-22, 2017 in the Pioneer Batch Continuing Education Centre (PBCEC) seminar room in the Visitors' Hostel at IIT Kanpur. The RTDS facility is located in the Department of Electrical Engineering, ACES Building IIT Kanpur, wherein the lab demonstration will be held on 22th February, 2017 afternoon.

Coordinator

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International Workshop

on

**Agent Based Self Healing Energy
Systems: Design and
Implementation**

February 21-22, 2017

at

Indian Institute of Technology Kanpur

Jointly Organized by



Indian Institute of Technology Kanpur

&

Indian Institute of Technology Delhi

Sponsored by

**Science and Engineering Research
Board (SERB), Department of Science
and Technology (DST), New Delhi**