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## International Conference on Computational Methods in Manufacturing

The International Conference on Computational Methods in Manufacturing (ICMM 2011) was held during 15-16 December 2011 at IIT Guwahati. The conference focussed on the latest developments in the field of computational methods applied to manufacturing and provided an excellent opportunity to exchange ideas and share knowledge in latest hard and soft computing methods that could be applied in the modelling and optimisation of manufacturing processes. The conference put major focus on industrial application of academic knowledge. In addition to contributory papers, the



Participants of the ICMM 2011



Shri Nayan Mani Borah, CMD, Oil India Ltd., inaugurating the conference in the presence of Prof. Gautam Barua, Director and Prof. D. Chakraborty, HoD, Mechanical Engineering

conference invited renowned experts for delivering keynote addresses and special lectures in the field of computational methods applied to manufacturing.

About eighty delegates from across the country and abroad took part in the conference. Shri Nayan Mani Borah, Chairman and Managing Director, Oil India Limited, was the Chief Guest of the inauguration function.

The keynote speakers were Prof. Kornel F. Ehmann, Mechanical Engineering, Northwestern University, USA; Prof. P. M. Dixit,

Head, Department of Mechanical Engineering, IIT Kanpur; Prof. Jay Gunasekera, Mechanical Engineering, Ohio University, USA; Prof. N. Venkata Reddy, Mechanical Engineering, IIT Kanpur; Mr. Michael Wohlmuth, Managing Director and CEO, Simufact Engineering GmbH; and Prof. S. S. Pande, Mechanical Engineering, IIT Bombay. Prof. Kornel Ehmann gave the inaugural talk on Generation of Multi-Scale High Density Surface Textures. Prof. Debabrata Chakraborty, Head, Department of Mechanical Engineering, IIT Guwahati, was the Chairman and Prof. Uday S. Dixit, Mechanical Engineering, was the Secretary of the organising committee.



Prof. U. S. Dixit addressing the gathering while on dais from L-R, Prof. S. Nandi, Dean, Academic Affairs; Prof. P. M. Dixit, IIT Kanpur and Prof. P. Mahanta, Mechanical Engineering, IIT Guwahati

# International Conference on Advanced Nanomaterials and Nanotechnology

The second edition of International Conference on Advanced Nanomaterials and Nanotechnology (ICANN-2011) was organised at IIT Guwahati during 8-10 December 2011. It was jointly organised by the Department of Physics and Centre for Nanotechnology.



*Prof. D. D. Sarma and Prof. M. Meyyappan inaugurating the conference*

The conference successfully brought together eminent scientists, technologists and young researchers from several disciplines across the globe on a common platform for discussing various aspects of nanotechnology. Some of the frontier areas of nanoscience and technology that were discussed and debated were – synthesis and self-assembly of nanomaterials, nanoscale characterisation, nanophotonics and nanoelectronics, nano-biotechnology, nanocomposites, nanomagnetism, nanomaterials for energy, computational nanotechnology, and commercialisation of nanotechnology, etc. Plenary sessions, invited talks, oral and poster presentations

were part of the conference.

The conference was represented by around 400 participants. Prof. D. D. Sarma from IISc, Bangalore and Prof. M. Meyyappan from NASA Ames Research Centre, USA were present as the chief guest and guest of honour in the inaugural function. Prof. G. Ramanath, RPI, USA; Prof. M. K. Sunkara, University of Louisville, USA; Prof. Manish Chhowalla, Rutgers University, USA; Prof. S. R. P. Silva, University of Surrey, UK; Prof. Yosio Bando, NIMS, Japan; Prof. T. Pradeep, IIT Madras among others delivered plenary talks.

In addition, several invited talks were delivered by leading experts in the field and a total of 345 papers (through invited talks, oral and poster presentations) by the delegates from fifteen countries and nine areas were covered in 21 sessions.

Dr. P. K. Giri, Dr. D. K. Goswami, and Dr. A. Perumal were the Chairman, Co-chairman, and Secretary of the conference organising committee, respectively.



*Participants of ICANN-2011*

## North East Regional Conference on Mathematics Education

Department of Mathematics, organised a two-day North East Regional Conference on Mathematics Education (NERCME-2011) jointly with the Institute for Competency Advancement of Teachers (i-CAT), IGNOU, Guwahati, at IIT Guwahati during 25-26 November 2011. The conference was aimed at bringing together the researchers in mathematics

education, educators, policy makers, people engaged in mathematics education at various levels of this region to a common platform.

The conference was attended by about fifty participants from eight states of the North East region of the country. The deliberations included ten invited lectures by eminent persons in the country who are involved in Mathematics education and twenty two contributed lectures. Sharing their experiences and studies, the participants discussed different issues pertinent to mathematics education in this region. NERCME-2011 tried to address the prevailing ground realities in the mathematics education scenario in the region, its problems and their possible remedies. Prof. Bhaba Kumar Sarma, Department of Mathematics, was the coordinator of the programme.



*A view of the on going conference*

## Publications (Research Journal/Book/Book Chapter)

### Biotechnology

V. Kesari, L. Rangan, "Co-ordinated changes in storage proteins during development and germination of elite seeds of *Pongamia pinnata*, a versatile biodiesel legume", *Annals of Botany Plants*, DOI: 10.1093/aobpla/plr026, 2011

V. Kesari, L. Rangan, "Assessment of genetic diversity by RAPD markers in candidate plus trees of *P. pinnata*, a promising biodiesel plant", *Biomass and Bioenergy*, 35, pp 3123-3128, 2011

A. Jain, S. Hallihosur, L. Rangan, "Dynamics of nanotechnology patenting – An Indian scenario", *Technology in Society*, 33, pp 137-144, 2011

P. Vatsyayan, M. Chakraborty, S. Bordoloi, and P. Goswami, "Electrochemical investigations of fungal cytochrome P450", *Journal of Electroanalytical Chemistry*, 662, pp 312-316, 2011

### Computer Science and Engineering

P. Mitra, G. Sundaram and A. Tripathi, "Business process based database recovery and experimental results", *International Journal of Database Management Systems (IJDBMS)*, 3 (4), pp 118–130, November 2011

S. B. Nair, W. Godfrey, D. H. Kim, "On realising a multi-agent emotion engine", *International Journal of Synthetic Emotions (IJSE)*, IGI Global, 2 (2), pp 1-27, July-December 2011

C. L. Shrinivasa Naika, V. Nikhra, S. S. Jha, P. K. Das, S. B. Nair, "An intelligent face tracking system for human-robot interaction using camshift tracking algorithm", *International Journal of Machine Intelligence*, 3 (4), pp 263-267, 2011

W. Godfrey and S. B. Nair, "A bio-inspired technique for servicing networked robots", *International Journal of Rapid Manufacturing*, 2 (4), 2011

### Electronics and Electrical Engineering

S. Chouhan, M. Balakrishnan, R. Bose, "System level design space exploration methodology for energy efficient sensor node configurations: An experimental validation" *IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (TCAD)*, 2011

R. Bose, S. Chouhan, "Alternate Measure of Information Useful for DNA Sequences", *Physical Review E*, 83 (5), pp 051918, 2011

### Humanities and Social Sciences

S. Mallick, E. Haribabu and B. B. Reddy, "Industrialisation of seed production: Implications for agriculture in India", *Perspectives*

on *Global Development and Technology*, 10 (3-4), pp 441-457, December 2011

K. Bora and R. M. Puneekar, "Maximum city: Mumbai, spatial politics and representation", *Spaces and Flows: An International Journal of Urban and ExtraUrban Studies*, 1 (3), pp 151-166, 2011

### Mathematics

J. Mohapatra, S. Natesan, "Parameter-uniform numerical methods for singularly perturbed mixed boundary value problems using grid equidistribution", *Journal of Applied Mathematics and Computing*, 37, pp 247-265, October 2011

J. Mohapatra, S. Natesan, "Uniformly convergent numerical method for singularly perturbed differential-difference equation using grid equidistribution", *International Journal for Numerical Methods in Biomedical Engineering*, 27 (9), pp 1427-1445, September 2011

J. C. Kalita, A. K. Das, "Higher order compact simulation of double-diffusive natural convection in a vertical porous annulus", *Engineering Applications of Computational Fluid Mechanics*, 5 (3), pp 351-371, September 2011

### Physics

A. K. Sarma and P. Kumar, "Modulation instability of ultrashort pulses in quadratic nonlinear media beyond the slowly varying envelope approximation", *Applied Physics B*, DOI: 10.1007/s00340-011-4826-3, 2011

P. Kumar and A. K. Sarma, "Optical force on two-level atoms by few-cycle-pulse Gaussian laser fields beyond the rotating-wave approximation", *Physical Review A*, 84, pp 043402, 2011

### Energy

S. Khanna, A. Goyal, V. S. Moholkar, "Microbial conversion of glycerol: present status and future prospects", *Critical Reviews in Biotechnology*, 2011, DOI:10.3109/07388551.2011.604839

S. Khanna, A. Goyal, V. S. Moholkar, "Production of n-butanol from biodiesel derived crude glycerol using *Clostridium pasteurianum* immobilised on amberlite", *Fuel*, 2011, DOI:10.1016/j.fuel.2011.10.071

### Book, Book Chapter

#### Chemical Engineering

B. K. Kakati and A. Verma, *Carbon-polymer composite bipolar plate for PEM fuel cell: Development, characterisation, and performance evaluation*, LAP LAMBERT Academic Publishing, Germany, pp 176, 2011 (ISBN: 9783846503119)



### Civil Engineering

A. Dey and P. K. Basudhar, 'Inverse formulation for burger model parameter estimation', *Advances in Ground Technology and Geo-Information*, Ed. K. K. Phoon, S. H. Goh, R. F. Shen and H. Zhu, Research Publishing, Singapore, pp. 483-491 (ISBN No. 9789810701888)

### Humanities and Social Sciences

S. Borbora, 'Gandhian economic thought and economic planning in India', *A Study on Gandhian Philosophy*, Ed. Dr. K. J. Handique, Unika Prakashan, 2011

M. K. Dutta

*Irrigation Potential in Agriculture of Assam*, Concept Publishing Company (P) Ltd., New Delhi, 2011 (ISBN No. 9788180697753)

### Mechanical Engineering

S. D. Kore, J. Imbert, Y. Zhou, and M. Worswick, 'Magnetic Pulse Welding', *ASM Handbook, Volume 6A, Welding Fundamentals and Processes*, Eds. T. Lienert, T. Siewert, S. Babu, and V. Acoff, pp. 704-710, November 2011

## New Joinings



Bodhisatta Sengupta  
Assistant Professor  
Humanities and Social  
Sciences



Saswata Shannigrahi  
Assistant Professor  
Computer Science and  
Engineering



Gaurav Trivedi  
Assistant Professor  
Electronics and Electrical  
Engineering



Hrishikesh Sharma  
Assistant Professor  
Civil Engineering

## Inter IIT Sports Meet

IIT Guwahati students participated in the 47th Inter IIT sports meet 2011 held at IIT Kharagpur winning one gold, five silver and three bronze. Gold was won in pole vault; silver in javelin throw, weightlifting, basketball (women); and bronze in swimming (freestyle 50, 100 and 200 m).



In the 19th Inter IIT Staff sports meet held at IIT Kharagpur from 21-25 December 2011 the faculty and staff members of the Institute fared well with three gold in discus throw, shotput (men and women); and two bronze in javelin throw and long jump.



## Alumni Connect Campaign

The Alumni Connect Campaign, is an initiative aimed at promoting student-alumni as well as alumni-alumni interaction. Led by a team of student volunteers it aims to connect the alumni of the Institute in coordination with the alumni association and the office of the alumni affairs.

The campaign has already organised three talks by IIT Guwahati alumni. They are Mr. Manish Jha (BTech, Electronics and Communication Engineering, 2006 batch), Mr. Soumen Das (BTech, Mechanical Engineering, 2006 batch) and Mr. Ankit Nagori (BDes, Design, 2008 batch).



Mr. Ankit Nagori, an alumnus of the Institute and now Vice President, Flipkart, speaking on 'Flipkart: An Indian success story – History and business model'

# Seminar/Workshop/Invited Talk/Short Term Course Organised

## Civil Engineering

Prof. D. Nagesh Kumar, Department of Civil Engineering, IISc, Bangalore, delivered a guest lecture on 'Remote sensing and GIS applications in water resources' on 19 December 2011.

## Chemistry

Dr. Hubert Mutin, Directeur de Recherche CNRS, Institut Charles Gerhardt Montpellier, University Montpellier 2, Montpellier, France gave a lecture on 'Design of mixed-oxide catalysts using non-hydrolytic Sol-Gel routes' on 8 November 2011.

## Computer Science and Engineering

A short term course on 'Society and the Web' was organised during 19-23 September 2011 under QIP. Thirty teachers from various engineering colleges across the nation participated in the course. The course focussed on introducing the participants to various data mining techniques, web technologies and its potential applications for the Indian society. Dr. Sanasam Ranbir Singh and Dr. Amit Awekar, Assistant Professors, Computer Science and Engineering, were the course coordinators.

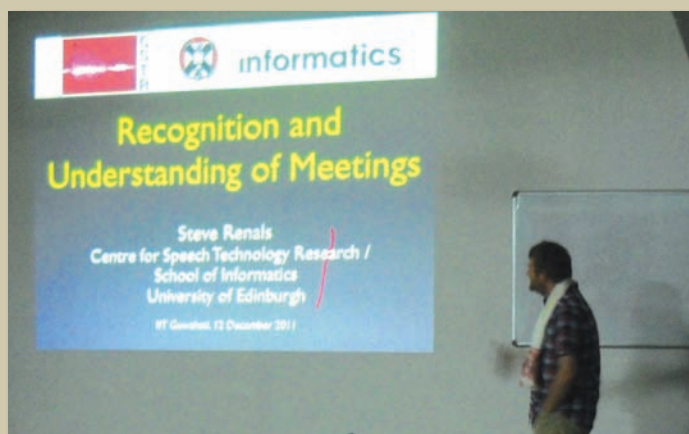
A research promotion workshop on 'Introduction to graph and geometric algorithms' was organised during 21-23 October 2011. Dr. Pinaki Mitra, Associate Professor, and Dr. R. Inkulu, Assistant Professor, Computer Science and Engineering were the coordinators of the workshop.

## Computer Science and Engineering, and Electronics and Electrical Engineering

Prof. Hynek Hermansky, JHU, USA, delivered a talk on 'Dealing with unknown unknowns in speech' on 9 December 2011.

Prof. Steve Renals, University of Edinburgh, delivered an invited talk 'Recognition and understanding of meetings' on 12 December 2011.

Prof. Hervé Bourlard, IDIAP Research Institute, Switzerland, delivered a talk on 'Analysis and understanding of communication scenes' on 13 December 2011.



Prof. Steve Renals, University of Edinburgh, delivering talk

## Electronics and Electrical Engineering

Prof. Preeti Rao, Department of Electrical Engineering, IIT Bombay, delivered an invited talk on 'Feature extraction for music information retrieval' on 27 December 2011.

Prof. T. V. Sreenivas, Department of Electronics and Communication Engineering, IISc, Bangalore, delivered an invited talk on 'Time-varying signal adaptive transform and IHT recovery of compressive sensed speech' on 29 December 2011.

## Humanities and Social Sciences

Dr. Purnamitra Dasgupta, Ford Foundation Chair in Environmental Economics and Acting Head, Environmental Economics Unit, Institute of Economic Growth, Delhi University, delivered a lecture on 'Forests, for 'rest'? Macro and micro economics of forests in India' on 18 November 2011. The lecture was part of the annual lecture series on the theme 'Political Economy of Development in India'.

## Mathematics

Prof. Mrinal K. Ghosh, Department of Mathematics, IISc, Bangalore, delivered a speech on 'Application of nonlinear filtering to credit risk' on 20 October 2011.

Prof. B. N. Mandal, NASI Platinum Jubilee Senior Scientist Fellow, Physics and Applied Mathematics Unit, Indian Statistical Institute Kolkata, gave a lecture on 'Cauchy Poisson problems in the linearised theory of water waves' on 20 October 2011.

Prof. Subhas C. Nandy, Advanced Computing and Microelectronic Unit, Indian Statistical Institute, Kolkata, gave a lecture on 'In-place algorithms for priority search tree and its application to largest empty rectangle recognition' on 15 November 2011.

Prof. Ram N. Mohapatra, Department of Mathematics, University of Central Florida, gave a talk on 'Frames for erasers' on 20 December 2011.

## Energy

A short term course on 'Hydroelectric power development' was organised during 5-9 December 2011 under QIP. About 25 participants from various engineering colleges of India attended the course.



Participants of short term course on Hydroelectric power development



A scene of the national workshop on use and deployment of web and video courses

### Centre for Educational Technology

A national workshop on use and deployment of web and video courses for enriching engineering education was organised during 4-5 November 2011. It was organised by Centre for Educational Technology.



Prof. A. K. Mallik delivering lecture

A popular lecture titled 'Mathemagical black holes, chaos and fractals' was delivered by Prof. A. K. Mallik, Honorary Distinguished Professor at BESU Shibpur and Former Professor of IIT Kanpur, on 31 October 2011. The lecture was organised by the Guwahati chapter of IIT Guwahati alumni association.

## New Projects Started

### Biotechnology

**Title:** Molecular and physico-chemical characterisation of selected ginger species from NE region; **Sponsor:** DBT; **Principle Investigator:** Latha Rangan

### Chemical Engineering

Visualisation of pebbles movement in generation IV innovative high temperature reactor by using radioisotope techniques; BRNS; Rajesh K. Upadhyay

Design and fabrication of a compact membrane based hydrogen separation system; DRDO; Rajesh K. Upadhyay

### Electronics and Electrical Engineering

Advanced embedded systems laboratory; Intel; Sonali Chouhan

### Mechanical Engineering

Mechanisation of Food Corporation of India (FCI) godown operations; S. N. Joshi, S. D. Kore

## Campus Placement

The campus placement of students at IIT Guwahati for the year 2011-2012 has been very encouraging. 81 companies from various sectors have already participated in the recruitment process. Another 30 or so companies are expected to visit the campus in January-February 2012.

A total of 693 students have registered for the campus placement of which 355 are BTech/BDes, 268 MTech/MDes, and 70 MSc/MA. 285 BTech/BDes have already been placed with a total of 307 jobs in hand. The highest pay package offered is US\$ 150000 (₹ 80 lakh approx.) and the average salary for the BTech/BDes stands at ₹ 9.3 lakh. The placement session will continue upto May 2012.

## Student Exchange

IIT Guwahati has signed MoUs with many universities and engineering institutions across the globe on exchange of students and researchers, and research collaborations. As a result of such MoUs students from University of Pardubice, Ecole des Ingenieurs da la Ville de Paris (EIVP) visited IIT Guwahati for short academic programmes. One research student from the Institute also visited University of Pardubice for a three months student exchange programme. Another foreign student also visited the Institute under C. V. Raman Fellowship for International students.



Two foreign students along with Prof. Sanjay K. Bose, Dean, Alumni Affairs and External Relations

## Young Ecologist Talk and Interact

Young Ecologist Talk and Interact (YETI), the largest students' scientific conference in the country on ecology, evolution, animal behaviour and conservation, was held at IIT Guwahati during 13-15 December 2011.

YETI is being organised entirely by student volunteers from across the country with support from several organisations, including WWF-India, Nature Conservation Foundation (NCF), National Centre for Biological Sciences (NCBS) and Aaranyak. YETI provides a friendly and inspiring platform for young



ecologists and conservation biologists, early in their career, to present and discuss their work, exchange ideas, and establish collaborations with their peers and contemporaries across the country.



A YETI 2011 session in progress

YETI 2011 primarily focussed upon the unique yet understudied rich biodiversity of the Northeast region of the country. YETI 2011 was organised in partnership with the Centre for the Environment of IIT Guwahati. Besides IIT Guwahati, YETI 2011 was being supported by 20 universities, 38 institutes and NGOs, and 40 colleges from Northeast India, in addition to several independent researchers.

With a turnout of 500 students and researchers, YETI 2011 featured a series of plenary lectures, popular talks, documentary screenings, workshops and interactive sessions by prominent national and international scientists, as well as more than 100 presentations by research students alone.

## Awards and Honours

Dr. Rakhi Chaturvedi, Associate Professor, Biotechnology, was felicitated with Prof. Y. S. Murty Medal 2011, instituted by Indian Botanical Society (IBS), at Lucknow University during the 34th Annual Congress of IBS from 10-12 October 2011.



Dr. Rakhi Chaturvedi (Centre) receiving Prof. Y. S. Murty Medal 2011

Dr. Latha Rangan, Associate Professor, Biotechnology, was (1) selected for Professor Hira Lal Chakravarty Memorial Award of Indian Science Congress Association (ISCA) for the year 2011-2012; (2) inducted editorial member of the open access 'Agriculture and Food Security' journal by BioMedCentral.

Dr. Anil Verma, Assistant Professor, Chemical Engineering,



Dr. T. Venkatesh (R) receiving the best paper award at ICON-2011

received Amar Dye-Chem Award (2011) by Chemical Engineers in India, IChE, during CHEMCON 2011.

Dr. Anil Verma, Assistant Professor and Dr. B. K. Kakati, research scholar, Chemical Engineering, received the best paper award in the 3rd International Conference on Fuel Cell and Hydrogen Technology during 22-23 November 2011, Kuala Lumpur, Malaysia for their paper titled "Efficient composite bipolar plate reinforced with graphene for proton exchange membrane fuel cell".

Prof. Arun Chattopadhyay, Chemistry, has been invited to serve on the editorial advisory board of *Nanoscale*, a journal of the Royal Society of Chemistry, for a two-year term, starting from January 2012.

Dr. T. Venkatesh, Assistant Professor, Computer Science and Engineering, and Mr. K. Phani Prakash, a former student of the same department, received best paper award at the 17th IEEE International Conference on Networks (ICON) held during 14-16 December 2011 at Singapore for the paper titled "A deadline-aware rate-adaptive packet pacing algorithm for small buffer networks".

Dr. S. R. Mahadeva Prasanna, Associate Professor, Electronics and Electrical Engineering, received research grants of US\$ 25,000 and US\$ 5,000 from IBM USA and IBM IRL India respectively to carryout research and developmental activities for coming up with computer based methods and tools for therapy and rehabilitation in case of speech, hearing and language disorders.

Dr. Vigya Kesari, a former student of the Department of Biotechnology has been selected for Young Scientist Award of Indian Science Congress in Agriculture and Forestry Sciences for the year 2011-2012.

Mr. Sankar Chakma, an MTech student of Chemical Engineering, received IChE Awards for the Year 2011 : Ambuja's Young Researcher's Awards for doing Post-Graduate Studies in India after GATE Examination for his thesis on "Mechanistic Optimisation of Ultrasonic Desorption of Aromatic Pollutants".

Dr. Jashmini Deka, Research Associate, Chemistry, received best poster award in 'Winter School 2011 on Chemistry and Physics of Materials' organised and sponsored by International Centre for Materials Science (ICMS, JNCASR, Bangalore) and University of Cambridge, during 5-10 December 2011.

## Memoranda of Understanding

IIT Guwahati signed MoUs on exchange of faculty, students and researchers, and research collaboration with the following universities:

1. College of Engineering, Hanyang University, Korea in November 2011.



*Prof. Gautam Barua and Prof. Dong Hyuk Shin, Dean, College of Engineering, Hanyang University after the signing of MoU*

2. Disaster Prevention Research Institute, Kyoto University, Japan in November 2011.

3. IDIAP Research Institute, Martigny, Switzerland in December 2011.



*Prof. Gautam Barua and Prof. Hervé Bourlard, Director, IDIAP Research Institute, Martigny, Switzerland after the signing of MoU*

4. University of Della Calabria, Italy in December 2011.

5. Universidad Carlos III De Madrid, Spain in December 2011.

## PhDs Completed During October–December 2011

Department/Centre	No. of Students
Biotechnology	1
Chemical Engineering	2
Civil Engineering	3
Electronics and Electrical Engineering	4
Mathematics	1
Mechanical Engineering	1
<b>Total</b>	<b>12</b>

## New admissions in PhD Programmes

Department/Centre	No. of students
Biotechnology	5
Chemical Engineering	4
Chemistry	3
Civil Engineering	9
Computer Science and Engineering	7
Design	1
Electronics and Electrical Engineering	18
Humanities and Social Sciences	7
Mathematics	3
Mechanical Engineering	12
Physics	4
Centre for the Environment	2
<b>Total</b>	<b>75</b>