

Participation by Industry and National Research Institutes



*Growth of ultrathin
tunnelling oxide via
Rapid Thermal
Processor.*

The participation by Industry and the NRIs is multi-faceted, as these organisations provide not only the time, space and opportunities for SMA's students to apply their knowledge to real and actual industrial problems and scenarios, they get to play a part in cultivating the talent from Asia.

Internship

SMA's industrial partners and the NRIs have been offering industry-related or research projects for the SMA Internship Programme. These projects address industry's and the NRIs' concerns and challenge the students' initiative, creativity and problem-solving capability in a very real way. Here, students are challenged not only to come up with solutions to complex problems that are innovative, but also to make sure these solutions can be applied to real and industry-related problems.

The organisations that participated in the S.M. Internship Programme (2001/2002) include:

- Agency for Science, Technology and Research (A*STAR)
- Agilent Technologies Singapore Pte Ltd
- Apple Computers Singapore
- Beecham Pharmaceuticals (Pte) Ltd
- Centre for Wireless Communications (CWC)
- Chartered Semiconductor Manufacturing Ltd
- Data Storage Institute (DSI)
- Defence Science & Technology Agency (DSTA)
- Delphi Automotive Systems (S) Pte Ltd
- Dow Chemicals Pacific (S) Pte Ltd
- FinIQ Consulting Pte Ltd
- Glaxo Wellcome Manufacturing Pte Ltd
- Hewlett-Packard Singapore (Pte) Ltd
- ILOG (S) Pte Ltd
- Institute of Chemical Sciences
- Institute of High Performance Computing (IHPC)
- Institute of Materials and Research Engineering (IMRE)
- Institute of Microelectronics (IME)
- Maritime & Port Authority of Singapore (MPA)
- Merck Sharp & Dohme (Singapore) Ltd
- National Semiconductor Corporation (Singapore) Pte Ltd
- National Semiconductor Manufacturer (S) Pte Ltd
- PSA Corporation Ltd
- Schering-Plough Ltd
- Singapore Institute of Manufacturing Technology (SIMTech)
- Singapore Technologies Engineering
- Systems on Silicon Manufacturing Co. Pte Ltd (SSMC)
- Temasek Laboratories

Book Prizes

Both industry and the NRIs award book prizes to the top students in programmes relevant to them.

Sponsors for the book prizes in 2001/2002 include:

- Advanced Systems Automation Pte Ltd
- Agilent Technologies Singapore Pte Ltd
- Apple Computers Singapore
- Chartered Semiconductor Manufacturing Ltd
- DSO National Laboratories
- Glaxo Wellcome Manufacturing Pte Ltd
- Hewlett-Packard Singapore (Pte) Ltd
- Hong Guan Technologies (S) Pte Ltd
- Institute of Materials and Research Engineering (IMRE)
- Institute of Microelectronics (IME)
- Integrated Decision Systems Consultancy Pte Ltd (IDSC)
- Motorola Electronics Pte Ltd
- Philips Electronics Singapore Pte Ltd
- Schering-Plough Ltd
- Singapore Institute of Manufacturing Technology (SIMTech)
- Singapore Technologies Engineering

Job Placement



Arc Melter used for preparation of metal alloys and casting of bulk amorphous metals.



SMA assists its graduates in their job placement upon graduation. The companies where SMA graduates (2001/2002) have found employment include:

- AFPD Pte Ltd
- APF Logistics Ltd
- Agilent Technologies Singapore Pte Ltd
- Apple Computer Ltd (Singapore)
- Bioprocessing Technology Centre
- Caterpillar Logistics Services Inc.
- Chartered Semiconductor Manufacturing Ltd
- CrimsonLogic Pte Ltd
- DaimlerChrysler South East Asia Pte Ltd
- Data Storage Institute
- Defence Science & Technology Agency
- DSO National Laboratories
- Economic Development Board
- Energizer Singapore Pte Ltd
- Hyundai Heavy Industry Co. Ltd
- Institute of High Performance Computing
- Institute of Materials Research & Engineering
- Integrated Decision Systems Consultancy Pte Ltd
- Laboratories for Information Technology
- Land Transport Authority
- Micron Semiconductor Asia Pte Ltd
- Motorola Electronics Pte Ltd
- National University of Singapore
- Netrust Pte Ltd
- Obagashi Corp
- Philips Electronics Singapore Pte Ltd
- PhytoProtein Biotech Pte Ltd
- Republic of Singapore Air Force
- Rohwedder Asia Pacific (Malaysia)
- SembCorp Industries
- Senoko Power Station
- Singapore Institute of Manufacturing Technology
- Sony Electronic (S) Pte Ltd
- Standard Chartered Bank
- Systems on Silicon Manufacturing Co. Pte Ltd
- Tech Semiconductor Singapore Pte Ltd
- Temasek Laboratories
- The Logistics Institute - Asia Pacific

Admissions

RE-MIT ALLIANCE (SMA)
tion for Graduate Admission

applicants
black or blue ink.

the in :

1st choice
S.M.
2nd choice

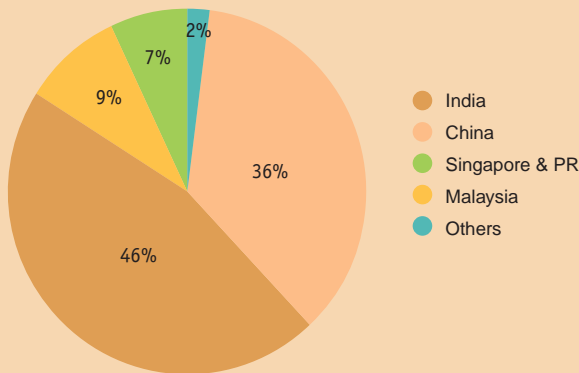


Application and Enrolment

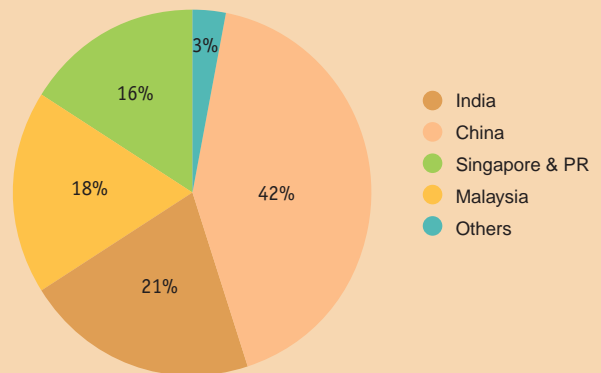
AMM&NS Programme

As many as 225 applications were received for the 2001/2002 intake, 46% of which were from India and 36% from China. 38 of the 69 applicants who were offered admission, accepted the offer. Most of the candidates were from China, India and Malaysia.

Applications (Yr 2001/2002)



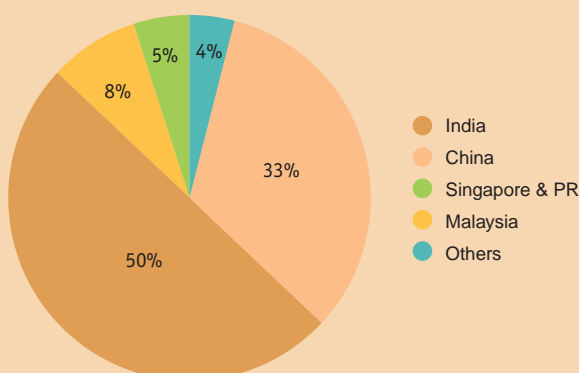
Enrolment (Yr 2001/2002)



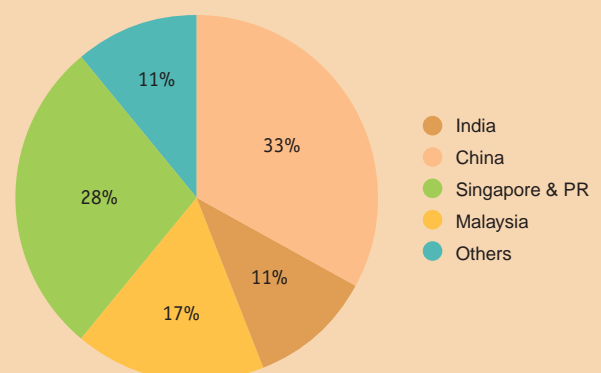
HPCES Programme

315 applications were received for the 2001/2002 intake, of which almost 50% of whom were applicants from India. 67 places were offered, out of which 36 were accepted and more than half of these were accepted by students from China and Singapore.

Applications (Yr 2001/2002)



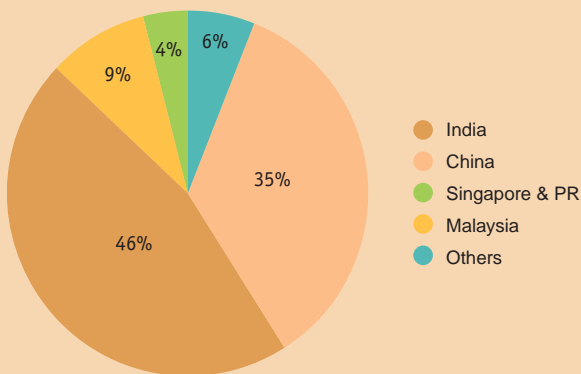
Enrolment (Yr 2001/2002)



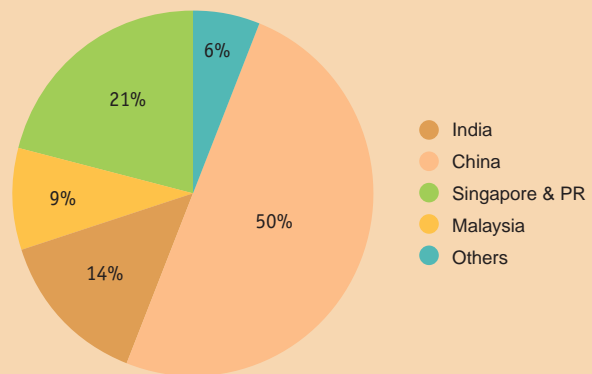
IMST Programme

232 applications were received for the 2001/2002 intake, 46% of which came from India. 54 places were offered and 34 accepted the offer, half of which were taken up by students from China.

Applications (Yr 2001/2002)



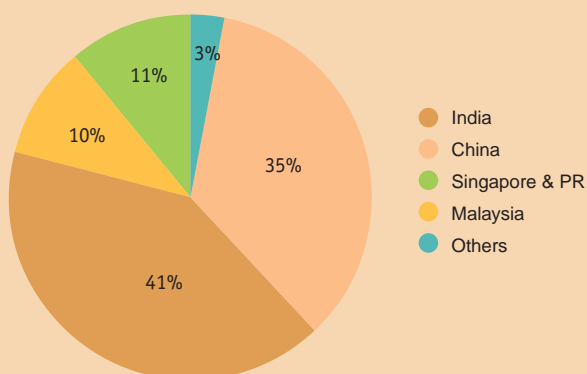
Enrolment (Yr 2001/2002)



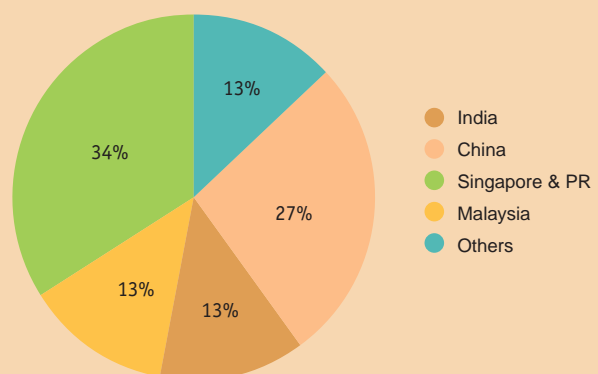
MEBCS Programme

169 applications were received for the 2001/2002 intake, 76% of which were made by students from China and India. Of the 42 places offered, 15 were accepted.

Applications (Yr 2001/2002)



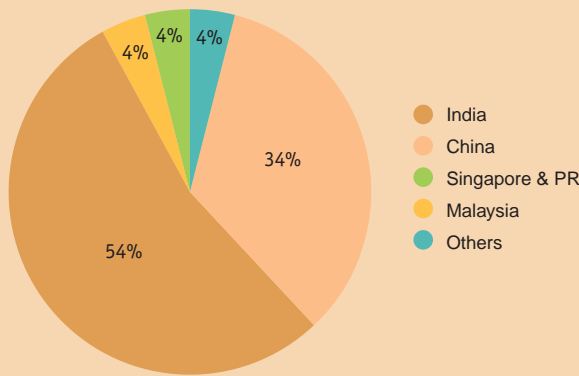
Enrolment (Yr 2001/2002)



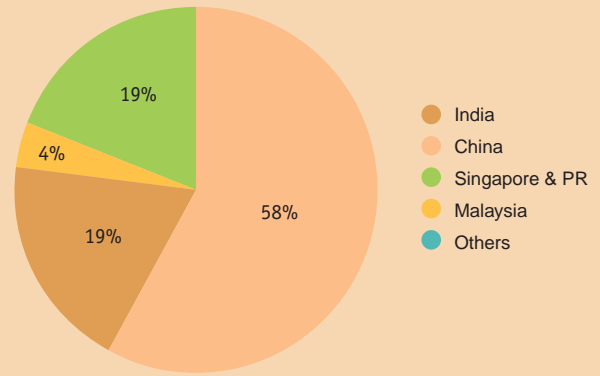
CS Programme

There was a total of 413 applications, mainly from China and India for the 2001/2002 intake. 65 applicants were offered admission, half of whom accepted, with the majority of them from China.

Applications (Yr 2001/2002)



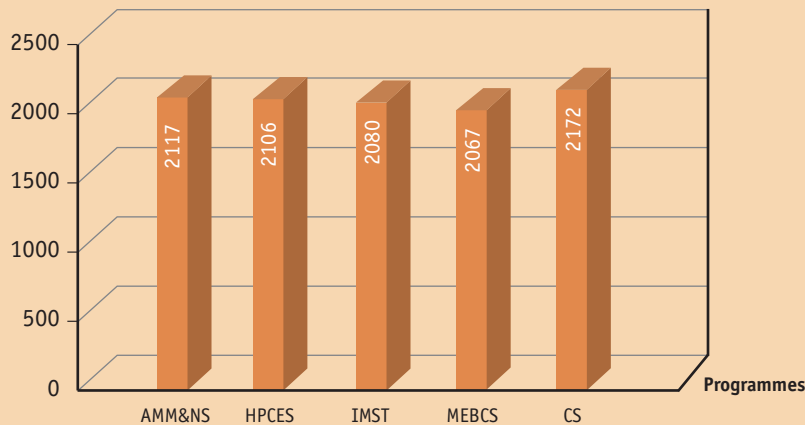
Enrolment (Yr 2001/2002)



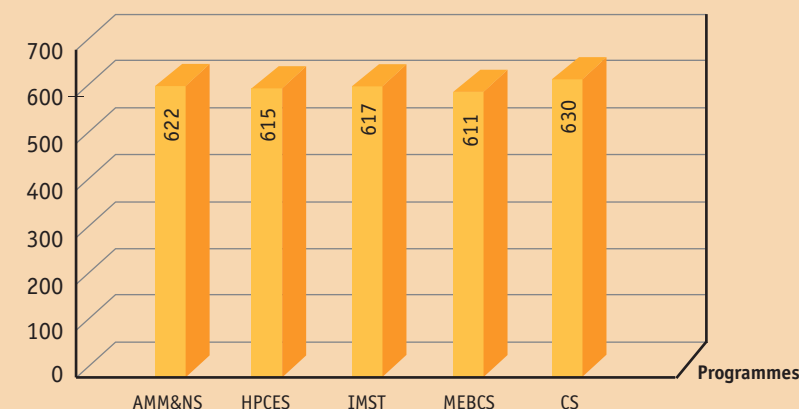
Average GRE and TOEFL scores of SMA Students

GRE and TOEFL scores are only two out of several stringent selection criteria for admission to SMA. Applicants are also evaluated based on their undergraduate performance (academically and in terms of participation in extra-curricular activities), performance during interviews and professional promise. The overall average GRE and TOEFL scores for all the 5 programmes in Year 2001/2002 are 2116 (against the maximum score of 2400) and 621 (against the maximum score of 677) respectively.

Average GRE scores (Yr 2001/2002)



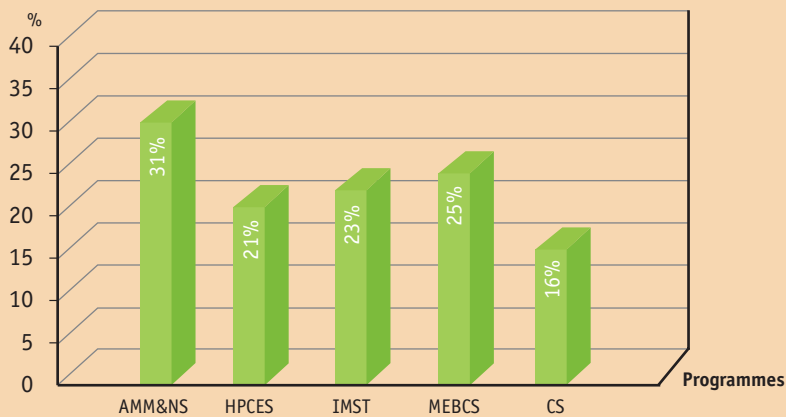
Average TOEFL scores (Yr 2001/2002)



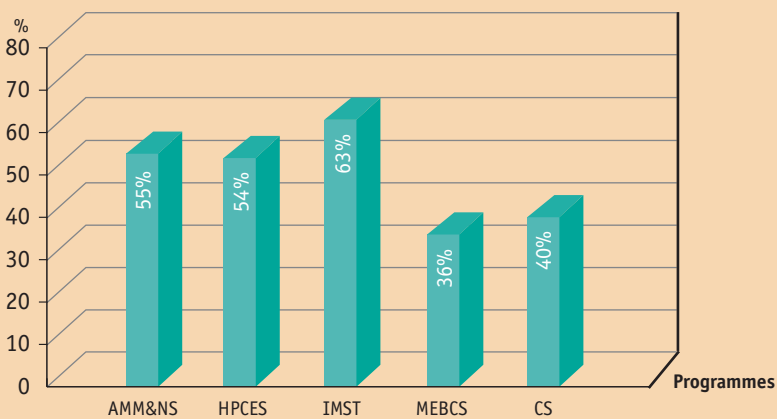
Selectivity and Yield

Selectivity is the percentage of offers over the number of applications while Yield is the number of students enrolled over the number offered. The overall average of Selectivity and Yield for all the 5 programmes are 31% and 50% respectively.

Selectivity (Yr 2001/2002)



Yield (Yr 2001/2002)



Faculty and Staff



Administrative, Professional and Non-Academic Staff Training and Development

To remain adaptable to the demanding needs of the changing economy, staff members are constantly encouraged to upgrade and learn new skills and practices through training and development.

The courses conducted for the staff range from specialised programmes on communication and language, personal effectiveness and change management to computer-based training on Microsoft Office tools and desktop publishing.

International Exposure

SMA's Singapore Fellows have gained better international exposure by attending overseas conferences and carrying out research at MIT.

In 2001/2002, 25 Singapore Fellows and Associates attended a total of 23 conferences, three meetings, five symposiums, one workshop and two congresses overseas. 15 trips were made to MIT and other overseas universities for research collaboration.

SMA Fellows also invited foreign lecturers for short-term visits to do research collaboration and conduct seminars for the SMA students and the academic staff of both NUS and NTU.

Fellows and Associates

Biographical summaries can be viewed online on the SMA website (<http://www.sma.nus.edu.sg>).

AMM&NS Programme

Singapore Fellows

CHUA, Soo-Jin

Deputy Co-Director & Programme Advisor
Professor, Department of Electrical and Computer Engineering, NUS

Ph.D. in Electrical Engineering - University of Wales, Cardiff, UK 1977

Expertise: Molecular beam epitaxy, metal organic vapor phase epitaxy, optoelectronic and photonic devices, high speed devices and device stimulation.

CHOI, Wee Kiong

Programme Co-Chair

Associate Professor, Department of Electrical and Computer Engineering, NUS

Ph.D. in Electrical Engineering - Edinburgh University, Scotland, UK 1986

M.B.A. - Edinburgh University 1991

Expertise: Silicon-silicon oxide system, SiC films, amorphous and crystalline SiGe films, rapid thermal oxidation, rapid thermal annealing and nanotechnology.

CHIM, Wai Kin

Course Coordinator

Associate Professor, Department of Electrical and Computer Engineering, NUS

Ph.D. - National University of Singapore

Expertise: Photon emission microscopy, MOS device reliability, integrated circuit failure analysis, scanning electron microscopy and scanning probe microscopy.

DU, Hejun

Associate Professor, School of Mechanical and Production Engineering, NTU

Ph.D. in Aeronautical Engineering - Imperial College, UK 1991

Expertise: MEMS sensors and actuators, shape memory thin films, smart materials and structures, topology optimisation, computational mechanics and modelling.

LI, Yi

Associate Professor, Department of Materials Science, NUS

Ph.D. - Department of Metallurgy, University of Sheffield, UK 1990

Expertise: Formation and structure of bulk metallic glass, solidification of peritectic alloys and rapid solidification of lightweight metals.

LU, Li

Associate Professor, Department of Mechanical Engineering, NUS

Ph.D. - Department of Metallurgy and Materials Engineering, Catholic University of Leuven 1989

M.Eng. - Department of Mechanical Engineering, Tsinghua University, China

Expertise: Powder metallurgy, functional materials, in-situ reaction, phase transformation and thin film.

WONG, Chee Chong

Associate Professor, School of Materials Engineering, NTU
Ph.D. - MIT

Expertise: Microelectronic and optical interconnects, flip chip packaging and subsystem integration, flat panel display materials and processes, fundamentals of thin film growth.

WU, Ping

Senior member of technical staff, IHPC

Adjunct Associate Professor of Materials Science and Engineering, NUS

Ph.D. in Materials Science and Engineering - University of Montreal, Canada 1992

Expertise: Atomistic computer modelling of materials computational thermodynamics, pattern recognition and data mining for materials research, materials design.

Singapore Associates

TAY, Andrew

Professor, Department of Mechanical Engineering, NUS
Ph.D. in Mechanical Engineering - University of New South Wales 1974

Expertise: Electronics packaging, numerical simulation, interfacial delamination, moisture diffusion in plastic integrated circuit packages, wirebonding and solder joint reliability.

YEADON, Mark

Assistant Professor, Department of Materials Science, NUS

Ph.D. - University of Birmingham 1995

Expertise: In-situ growth and characterisation of thin films and nanostructured materials by ultrahigh vacuum transmission electron microscopy (UHVTEM), epitaxial and polycrystalline silicides, oxides and nitrides and ultrathin amorphous materials.

MIT Fellows

THOMPSON, Carl V.

Programme Co-Chair

Stavros Salapatos Professor of Materials Science and Engineering, MIT

Ph.D. in Applied Physics - Harvard University 1982

Expertise: Processing and properties of thin films for applications in electronic, magnetic, and microelectromechanical devices and systems.

ANAND, Lallit

Professor of Mechanical Engineering, MIT

Ph.D. - Brown University 1975

Expertise: Mechanics and materials: plasticity, deformation processing, friction, and powders.

ANTONIADIS, Dimitri A.

Ray and Maria Stata Professor of Electrical Engineering, MIT

Ph.D. - Stanford University 1976

Expertise: MOSFET device physics and technology.

CARTER, Craig

Associate Professor of Materials Science and Engineering, MIT

Ph.D. - University of California, Berkeley 1989

Expertise: Computational materials science, theory and simulation of materials and material properties, surface and interfacial phenomena, ceramics, and materials processing.

CEDER, Gerbrand

Union Minière Professor of Materials Science, MIT

Ph.D. - University of California, Berkeley 1991

Expertise: Computational materials science, phase stability, electroceramics, and Li batteries.

FITZGERALD, Eugene A.

Professor of Materials Science and Engineering, Lord Chair, MIT

Ph.D. in Materials Science and Engineering - Cornell University 1989

Expertise: Electronic materials, heteroepitaxy, and lattice-mismatched materials.

FONSTAD, Jr., Clifton G.

Vitesse Professor of Electrical Engineering and Computer Science, MIT

Ph.D. in Electrical Engineering - MIT 1970

Expertise: Compound semiconductor heterostructure devices and physics, optoelectronic devices and their monolithic integration with GaAs and Si ICs, GaAs IC design, and nanoscale thermophotovoltaics.

SPEARING, Mark

Associate Professor of Aeronautics and Astronautics, MIT

Ph.D. - Cambridge University 1990

Expertise: Mechanism-based modeling and design with composites, structures, materials, and packaging for high power density MEMS.

MIT Associate**MARZARI, Nicola**

Assistant Professor, Computational Materials Science, MIT

Laureate in Physics, University of Trieste, 1992

Ph.D. in Physics - Cambridge University 1996

Expertise: Development and application of "computer experiments" to understand the microscopic behavior of materials.

HPCES Programme**Singapore Fellows****KHOO, Boo Cheong**

Programme Co-Chair

Associate Professor, Department of Mechanical Engineering, NUS

Ph.D. in Mechanical Engineering - MIT 1988

Expertise: Near-wall hot-wire measurements, underwater explosion and bubble dynamics, flow stability, microflows and numerical techniques.

LI, Le-Wei

Course Coordinator

Associate Professor, Department of Electrical and Computer Engineering, NUS

Ph.D. in Electrical and Computer Systems Engineering - Monash University 1992

Expertise: Computational electromagnetics, electromagnetic theory, antenna analysis and design, EMC and EMI, and radiowave propagation, radiation and scattering.

DAMODARAN, Murali

Associate Professor, School of Mechanical and Production Engineering, NTU

Ph.D. in Aerospace Engineering - Cornell University 1987

Expertise: Computational fluid dynamics, aerodynamics, engineering design optimisation with advanced computational analysis, computational modelling of multi-disciplinary engineering problems, high performance computing, computer graphics and animation.

LEE, Kwok Hong

Director (Research), IHPC

Associate Professor, Department of Mechanical Engineering, NUS

Ph.D. in Mechanical Engineering - Imperial College 1983

Expertise: Modelling of mechanical behaviour of materials and devices.

LIU, Guirong

Associate Professor, Department of Mechanical Engineering, NUS

Ph.D. in Mechanical Engineering - Tohoku University 1991

Expertise: Computational mechanics, finite element methods, mesh free methods, inverse problems, structural dynamics, fluid-structural interaction and mechanics for composites.

SUN, Jie

Professor, Department of Decision Sciences, NUS

Ph.D. in Applied Mathematics - University of Washington 1986

Expertise: Mathematical optimisation, convex programming and interior point methods.

TAI, Kang

Assistant Professor, School of Mechanical and Production Engineering, NTU

Ph.D. in Mechanical Engineering - Imperial College 1995

Expertise: Optimisation, genetic and evolutionary algorithms, structural design optimisation, synthesis of compliant mechanisms by topology and shape optimisation.

TEO, Chung Piau

Johnson and Johnson Associate Professor of Supply Chain Management, Department of Decision Sciences, NUS

Ph.D. in Operations Research - MIT 1996

Expertise: Discrete optimisation and supply chain management.

TOH, Kim Chuan

Assistant Professor, Department of Mathematics, NUS
Ph.D in Applied Mathematics - Cornell University 1996
Expertise: Optimisation theory and algorithms for convex programming, self-scaled cone programming, iterative methods for solving large-scale linear systems of equations and eigenvalue problems.

WANG, Jian-Sheng

Associate Professor, Department of Computational Science, NUS
Ph.D. in Physics - Carnegie-Mellon University 1987
Expertise: Monte Carlo methods and statistical physics.

Singapore Associates**CHOU, Cheng-Feng Mabel**

Assistant Professor, Department of Decision Sciences, NUS
Ph.D. in Industrial Engineering and Management Sciences - Northwestern University 2001
Expertise: System optimisation, machine scheduling, logistics and supply chain analysis.

HUANG, Huei Chuen

Associate Professor, Department of Industrial and Systems Engineering, NUS
Ph.D. - Yale University 1976
Expertise: Combinatorial optimisation, logistics, mathematical methods in social choice.

NHAN, Phan-Thien

FAA
Professor, Department of Mechanical Engineering, NUS
Ph.D. - Sydney University 1978
Expertise: Rheology, constitutive and numerical modelling, suspensions and soft viscoelastic solids.

MIT Fellows**PATERA, Anthony T.**

SMA Co-Director
Professor of Mechanical Engineering, MIT
Ph.D. in Applied Mathematics - MIT 1982
Expertise: Scientific and engineering computation, numerical methods and analysis, in particular spectral element and finite element methods for partial differential equations, optimisation, parallel processing, and applied mechanics, in particular fluid dynamics and transport phenomena, and stability theory.

PERAIRE, Jaime

Programme Co-Chair
Professor of Aeronautics and Astronautics, MIT
Doctor Ingeniero de Caminos, Canales y Puertos - University of Barcelona 1987
Expertise: Numerical analysis, finite elements, computational aerodynamics, and high performance computing.

MAGNANTI, Thomas L.

Programme Advisor
Dean of the School of Engineering, MIT
Institute Professor, MIT
Ph.D. in Operations Research - Stanford University 1972
Expertise: Large-scale optimisation, communication systems, logistics, manufacturing, and transportation.

BERTSIMAS, Dimitris J.

Boeing Professor of Operations Research, MIT
Ph.D. in Applied Mathematics and Operations Research - MIT 1988
Ph.D. - University of Manchester, Institute of Science and Technology (UMIST) 1973
Expertise: Finance, optimisation, revenue management, and stochastic control.

FREUND, Robert M.

Theresa Seley Professor of Management Science, MIT
Ph.D. in Operations Research - Stanford University 1980
Expertise: Operations research, linear and nonlinear optimisation, complexity theory, and fixed point methods.

WHITE, Jacob K.

Professor of Electrical Engineering, MIT
Ph.D. - University of California, Berkeley 1985
Expertise: Computational electromagnetics, integrated circuit computer-aided design, microelectromechanical systems (MEMS) computer-aided design, and computational ocean structure analysis.

MIT Associates**HADJICONSTANTINO, Nicolas**

Assistant Professor of Mechanical Engineering, MIT
Ph.D. in Mechanical Engineering - MIT 1998
Expertise: Computational fluid dynamics, computational statistical mechanics, interface phenomena, microscale fluid mechanics, and thermodynamics.

PERAKIS, Georgia

Assistant Professor of Operations Research, MIT
Ph.D. in Applied Mathematics - Brown University 1993
Expertise: Theory and applications of static and dynamic, optimisation, equilibrium problems, variational inequalities, applications in transportation, pricing, and revenue management.

SCHULZ, Andreas S.

Class of 1958 Associate Professor of Operations Research, MIT
Ph.D. in Mathematics - Technische Universitaet Berlin, Germany 1996
Expertise: Mathematical optimisation, operations research, and scheduling.

STRANG, Gilbert

Professor of Mathematics, MIT
Ph.D. - University of California, Los Angeles 1959
Expertise: Wavelets, finite elements, theory and applications of linear algebra, mathematical exposition.

WILLCOX, Karen E.

Charles Stark Draper Assistant Professor of Aeronautics and Astronautics, MIT
Ph.D. - MIT 2000
Expertise: Computational fluid dynamics, reduced-order modeling, aeroelasticity, turbomachinery, system design, and optimisation.

IMST Programme

Singapore Fellows

NEE, Yeh Ching Andrew

SMA Co-Director

*Professor, Department of Mechanical Engineering, NUS
Active Member CIRP*

Ph.D. - University of Manchester, Institute of Science and Technology (UMIST) 1973

Expertise: Computer-aided design of metal stamping dies and plastic injection moulds, rapid prototyping, computer-aided process and fixture planning, application of AI techniques in manufacturing.

YUE, Chee Yoon

Programme Co-Chair

Professor and Dean, School of Mechanical and Production Engineering, NTU

Ph.D. - Monash University 1983

Expertise: Manufacturing physics and advanced materials processing.

TOR, Shu Beng

Course Coordinator

*Director, Design Research Centre,
Associate Professor, School of Mechanical and Production Engineering, NTU*

Ph.D. in CAD/CAM, Mechanical Engineering - University of Westminster, U.K. 1985

Expertise: CAD/CAM, design automation and process threads automation.

APPA IYER, Sivakumar

Associate Professor, School of Mechanical and Production Engineering, NTU

Ph.D. in Manufacturing Systems Engineering - Bradford, UK 1985

Expertise: Manufacturing systems engineering, advanced manufacturing planning & scheduling, on-line discrete event simulation and near real time decision support systems.

BHATNAGAR, Rohit

Assistant Professor, Nanyang Business School, NTU

Ph.D. - McGill University 1994

Expertise: Location and coordination issues in global supply chains, multi-plant coordination, logistics alliances, simulation of manufacturing systems, shop floor coordination and lead-time management.

Chen, I-Ming

Associate Professor, School of Mechanical & Production Engineering, NTU

Ph.D. in Mechanical Engineering -

California Institute of Technology 1994

Expertise: Reconfigurable automation, sensor-based mechanical system simulations, biomedical applications of reconfigurable robotic systems parallel kinematics machines (PKM) and smart material based actuators.

LAM, Yee Cheong

Professor, School of Mechanical and Production Engineering, NTU

Ph.D. - Melbourne University 1983

Expertise: Optimisation of manufacturing processes, numerical and physical modelling of material behaviours and manufacturing processes.

LOH, Han Tong

Associate Professor, Department of Mechanical Engineering, NUS

Ph.D. in Mechanical Engineering - University of Michigan, Ann Arbor 1989

Expertise: Robust design, rapid prototyping, design optimisation and CAD/CAM.

LU, Wen Feng

Manager, Process Optimisation and Management, Manufacturing Information Technology Division, SIMTech

Ph.D. in Mechanical Engineering - University of Minnesota 1990

Expertise: Design methodologies, enterprise knowledge management and decision support, enterprise process management, AI applications and intelligent machining.

NGOI, Kok Ann Bryan

Associate Professor, School of Mechanical and Production Engineering, NTU

Ph.D. - University of Canterbury 1990

Expertise: Ultra-precision engineering, micro-/nano-fabrication and nanometrology.

SUBRAMANIAM, Velusamy

Assistant Professor, Department of Mechanical Engineering, NUS

Ph.D. in Mechanical Engineering - MIT 1995

Expertise: Scheduling of manufacturing systems.

YOON, Soon Fatt

Professor and Vice-Dean (Research), School of Electrical and Electronic Engineering, NTU

Ph.D. in Electrical Engineering - University of Wales, Cardiff, UK, 1986

Expertise: Advanced semiconductor device processing and epitaxy, IC manufacturing, technology management in silicon wafer manufacturing.

Singapore Associate

XIE, Ming

Associate Professor, School of Mechanical and Production Engineering, NTU

Ph.D. - INRIA Rennes 1989

Expertise: Robotics, robotic vision and industrial automation.

MIT Fellows

HARDT, David E.

Programme Co-Chair

Professor of Mechanical Engineering, MIT

Ph.D. - MIT 1978

Expertise: Modeling and control of manufacturing processes, and system dynamics and control.

ANAND, Lallit*Professor of Mechanical Engineering, MIT**Ph.D. - Brown University 1975***Expertise:** Mechanics and materials: plasticity, deformation processing, friction, and powders.**CHUN, Jung-Hoon***Professor of Mechanical Engineering, MIT**Ph.D. in Mechanical Engineering - MIT 1984***Expertise:** Innovative manufacturing processes, semiconductor fabrication processes, and chemical-mechanical polishing (CMP).**GRAVES, Stephen C.***Abraham J. Siegel Professor, Sloan School of Management, MIT**Ph.D. - University of Rochester 1977***Expertise:** Mathematical modeling of supply chains and manufacturing systems for the purpose of providing decision support for the design and planning of these systems.**YOUCEF-TOUMI, Kamal***Professor of Mechanical Engineering, MIT**Sc.D. in Mechanical Engineering - MIT 1985***Expertise:** Systems and controls, precision machines design, robotics, and manufacturing automation.**MIT Associate****GERSHWIN, Stanley***Senior Research Scientist, Department of Mechanical Engineering, MIT**Ph.D. in Applied Mathematics - Harvard University 1971***Expertise:** Manufacturing systems, operations research, control theory, and engineering.**MEBCS Programme****Singapore Fellows****YAP, Miranda GS***Programme Co-Chair**Director, Bioprocessing Technology Centre**Professor, Department of Chemical and Environmental Engineering, NUS**Ph.D. in Chemical Engineering - University of Toronto 1979***Expertise:** Recombinant cell culture technology and proteomics applications.**LEE, Jim Yang***Course Coordinator**Associate Professor, Department of Chemical and Environmental Engineering, NUS**Ph.D. in Chemical Engineering - University of Michigan 1985***Expertise:** Electrochemical energy conversion and detection methodologies, battery materials synthesis and modification, and chemical and electrochemical metallisation.**CHEN, Yuzong***Associate Professor, Department of Computational Science, NUS**Ph.D. in Mathematics - UMIST, U.K. 1989***Expertise:** Computational chemistry, molecular modelling and computer-aided drug design.**CHOW, Gan-Moog***Associate Professor, Department of Materials Science, NUS**Ph.D. in Materials Science - University of Connecticut 1988***Expertise:** Synthesis, characterisation and properties of nanostructured materials.**TAM, Michael K. C.***Associate Professor, School of Mechanical and Production Engineering, NTU**Ph.D. in Chemical Engineering - Monash University 1991***Expertise:** Rheology and microstructure of associative polymer systems.**TOO, Heng-Phon***Associate Professor, Department of Biochemistry, NUS**Ph.D. in Biochemistry - Imperial College, UK 1985***Expertise:** Molecular neurobiology, molecular structures and functions of neurotrophic factors/receptors, gene expression, g-protein coupled receptors.**VALIYAVEETIL, Suresh***Assistant Professor, Department of Chemistry, NUS**Ph.D. in Supramolecular Chemistry and Organic Synthesis - University of Victoria 1992***Expertise:** Organic synthesis, multiphase self-assembly, biomaterials & biomineralisation, crystal engineering and supramolecular chemistry.**WANG, Chi-Hwa***Assistant Professor, Department of Chemical and Environmental Engineering, NUS**Ph.D. in Chemical Engineering - Princeton University 1995***Expertise:** Fluid mechanics and biomedical engineering.**MIT Fellows****YING, Jackie Y.***Programme Co-Chair**Professor of Chemical Engineering, MIT**Ph.D. - Princeton University 1991***Expertise:** Synthesis of nanostructured materials and molecular sieves, catalysts design for fine chemicals synthesis and environmental catalysis, surface chemistry and functionalisation of inorganic systems, and polymer-based biomaterials.**BROWN, Robert A.***Programme Advisor**Provost and Warren K. Lewis Professor of Chemical Engineering, MIT**Ph.D. - University of Minnesota 1979***Expertise:** Newtonian and non-Newtonian fluid mechanics, heat and mass transfer, solidification theory and defect formation in crystalline solids, applications to materials processing, applied mathematics, and numerical analysis.

HATTON, T. Alan

Ralph Landau Professor of Chemical Engineering Practice, MIT

Ph.D. - University of Wisconsin 1981

Expertise: Thermodynamics and dynamics of self-assembly and solubilisation, biological and environmental separation processes, green processing, and tailored magnetic fluids.

LAIBINIS, Paul E.

Associate Professor of Chemical Engineering, MIT

Ph.D. - Harvard University 1991

Expertise: Organic surface chemistry, interfacial engineering, sensor design, biosurfaces, and tailored magnetic fluids.

LODISH, Harvey F.

Professor of Biology and Professor of Bioengineering, MIT Member, Whitehead Institute for Biomedical Research, MIT

Ph.D. - Rockefeller University 1966

Expertise: Expression cloning and characterisation of cell surface receptors, signal transduction proteins, and novel growth factors.

SMITH, Kenneth A.

Edwin R. Gilliland Professor of Chemical Engineering, MIT

Sc.D. - MIT 1962

Expertise: Applications of fluid mechanics and transport principles to a variety of phenomena, including those found in living systems and in the processing of biologically relevant materials.

STEPHANOPOULOS, Gregory N.

Professor of Chemical Engineering, MIT

Ph.D. - University of Minnesota 1978

Expertise: Metabolic engineering, genomics, biotechnology, and bioinformatics.

WANG, Daniel I. C.

Institute Professor of Chemical Engineering, MIT

Ph.D. - University of Pennsylvania 1963

Expertise: Bioreactor design, animal cell technology, protein characterisation, and protein stability and protein refolding.

MIT Associate**TROUT, Bernhardt L.**

Doherty Professorship in Ocean Utilisation and Assistant Professor of Chemical Engineering, MIT

Ph.D. - University of California, Berkeley 1996

Expertise: Molecular computations, sustainable development, heterogeneous catalysis, and reactions of proteins.

CS programme**Singapore Fellows****Leong, Tze Yun**

Programme Co-Chair

Associate Professor, School of Computing, NUS

Ph.D. - MIT 1994

Expertise: Artificial intelligence, uncertain reasoning, temporal reasoning, machine learning, biomedical informatics.

WONG, Weng-Fai

Course Coordinator

Associate Professor, School of Computing, NUS

Ph.D. in Engineering Science - University of Tsukuba, Japan 1993

Expertise: Computer architecture and parallel processing.

CHIN, Wei Ngan

Associate Professor, School of Computing, NUS

Ph.D. in Computing - Imperial College, University of London 1990

Expertise: Programming languages, advanced compilation techniques, programme transformation and static analysis, software models and methods.

HSU, Wen Jing

Associate Professor, School of Computer Engineering, NTU

Ph.D. - National Chiao Tung

Expertise: Parallel and distributed processing and analysis of algorithms.

HSU, Wynne

Associate Professor, School of Computing, NUS

Ph.D. in Computer and Electrical Engineering - Purdue University 1994

Expertise: Data and image mining, content-based retrieval and artificial intelligence systems.

LEE, Wee Sun

Assistant Professor, School of Computing, NUS

Ph.D. - Australian National University 1996

Expertise: Machine learning and data compression.

OOI, Beng Chin

Professor and Vice Dean, School of Computing, NUS

Ph.D. in Philosophy (Computer Science) - Monash University (Australia) 1989

Expertise: Database performance issues, indexing techniques, multimedia databases, high-dimensional databases, P2P and distributed computing, and internet and genomic applications.

TAN, Kian Lee

Associate Professor, School of Computing, NUS

Ph.D. - NUS

Expertise: Join algorithms, multi-join optimisation, high dimensional indexing, index on air and energy efficient caching.

TEO, Yong Meng

Associate Professor, School of Computing, NUS

Ph.D. - University of Manchester 1989

Expertise: Grid computing, parallel and distributed systems, performance evaluation.

Singapore Associate**NG, Teck Khim**

Adjunct Fellow, School of Computing, NUS

Ph.D. in Electrical and Computer Science - Carnegie Mellon University 1999

Expertise: 3D scene reconstruction from images, view synthesis techniques, video processing, pattern recognition.

MIT Fellows

LEISERSON, Charles

Programme Co-Chair

Professor of Computer Science and Engineering,

MIT, Adjunct Professor, NUS

Ph.D. - Carnegie Mellon University 1981

Expertise: Algorithms, large-scale systems, and parallel and distributed computing.

AMARASINGHE, Saman

Associate Professor of Computer Science and Engineering, MIT

Ph.D. - Stanford University 1997

Expertise: Compiler optimizations, computer architectures, software engineering, and parallel computing.

EDELMAN, Alan

Associate Professor of Mathematics, MIT

Ph.D. - MIT 1989

Expertise: Numerical analysis and high performance computing.

KAEHLING, Leslie

Professor of Computer Science and Engineering, MIT

Ph.D. in Computer Science - Stanford University 1990

Expertise: Artificial intelligence, machine learning, and robotics.

LOZANO-PEREZ, Tomas

Professor of Computer Science and Engineering, MIT

Ph.D. - MIT 1980

Expertise: Artificial intelligence, computational chemistry and biology, computational geometry, and robotics.

MADNICK, Stuart

John Norris Maguire Professor of Information

Technology and Leaders for Manufacturing Professor of

Management Science, MIT Sloan School of Management

Ph.D. - MIT 1972

Expertise: Database and information integration technologies, impact of information technologies, and Internet applications.

RINARD, Martin

Associate Professor of Computer Science and Engineering, MIT

Ph.D. in Computer Science - Stanford University 1994

Expertise: Automatic programme analysis and compilation technique, with an emphasis on problems in distributed, embedded, and parallel systems.

RUDOLPH, Larry

Principle Research Scientist, Laboratory for Computer Science, MIT

Ph.D. in Mathematical Sciences - New York University, 1982

Expertise: Computer architecture, parallel processing, handheld devices, pervasive computing, and operating systems.

Student and Alumni Matters





Student Committees

SMA students participate actively not only academically, but also in co-curricular activities. The students form Student Committees to organise social and sports events, which provide opportunities for them to interact and foster close bonds, not just among themselves, but also with SMA Fellows.

Events organised by The Social Committee in 2001/2002

- The Mooncake Festival
- HPCES BBQ Event
- IMST BBQ Event
- AMM&NS BBQ Event

Events organised by The Sports and Facility Committee in 2001/2002

- 1st SMA Sports Day 2001
- 2nd SMA Sports Day 2001
- 1st GSS Soccer Cup Competition (joint effort with the Social Committee)
- SMA Inter-Programme Games Day (relay run around NUS campus)

SMA Alumni Club

The SMA Alumni Club has served as an important channel for all of the SMA students, graduates and professors to interact. It was formed after SMA's first cohort of students graduated in year 2000. Elected alumni members, who represent the various cohorts from the different programmes, form the core management committee. After two graduating batches, the Alumni Club now has more than 40 alumni signed up as Ordinary Members. More than 40 M.Eng. and Ph.D. students have also signed up as Associate Members.



The management committee has organised numerous social and professional activities for the SMA students, graduates and professors. These activities provide them with opportunities to interact and catch up with one another be it on work-related issues, career development or to provide feedback on the SMA Programmes. Through these activities, the SMA Alumni Club also hopes to create a homely environment for the foreign students so that they feel comfortable and secure enough to settle down in Singapore and establish their careers here.

A pool of dedicated students assist the core management committee in various areas, mainly, in helping the students settle down quickly in Singapore before the commencement of SMA coursework and linking the students to the alumni, helping them especially in the area of employment opportunities. This group of students serve as an important communication channel between the management committee and the student population.

MIT Club of Singapore

In line with SMA's aims to create a research hub with high quality students and develop the engines of growth through nurturing innovations, the MIT Club of Singapore is another of the various avenues in which to provide interaction and collaboration opportunities for the SMA students, Alumni and Fellows, through social events and informal forums. This enables the network of professionals and entrepreneurs in Singapore to share their invaluable experiences with the SMA students and foster industrial linkages with the SMA programmes.

Its main objectives include fostering relationships among MIT alumnae in Singapore and promoting programmes which will foster relationships with the faculty of MIT as well as other MIT clubs elsewhere, encouraging research activities and providing a forum for the discussion of all matters of science and the humanities beneficial to the people of Singapore, assisting and providing information to intending students to MIT, and also sponsoring programmes of a social nature between the Club and other similar clubs in Singapore.



As part of its long-term commitment to establish a mutually beneficial relationship with the students, it offers to the students affordable membership that enables them to enjoy many of the Club's privileges. The Club has also contributed to book prizes for the past few years.

Seminars

Seminars and workshops that were organised for the students in 2001/2002 include:

- Venture Investing and Building Successful Companies - What all engineers need to know (by Temasek Capital of Temasek Holdings).
- Seeking Venture Capital Financing - Perspective from a VC (by Intel Capital).
- Total Quality Management (by Professor Shoji Shiba, Professor Emeritus of Tsukuba University, Japan).
- Career Development Programme (by Organization Technology International (S) Pte Ltd.
- From Start to Finish... Challenges in the Evolution of Technology Startups (by INCUBE, Temasek Capital and Economic Development Board).

New Initiatives



*High Performance
Computational facility used
for research and teaching
activities for the HPCES
programme: the IBM
Regattas at IHPC.*



OL and SMA Course in February 2002.

Organisational Learning

Organisational Learning (OL) taps on SMA's role as the link between the local universities and MIT. It creates opportunities for the local universities to learn from MIT's experiences and adopt the best of MIT's practices. It aims to be a platform for long-term interaction and involvement with MIT.

Through the SMA programmes, for example, local tertiary institutions have ample opportunities to learn about MIT's achievements in areas of education, upstream (use-inspired) research and commercialisation. The local universities get to understand, for example, MIT's innovative aspects of educating its students, including the use of web-based teaching, its ability to develop its students to their fullest potential and instill the entrepreneurial spirit in them, its research and development activities funded by the private industry and close contacts the institute has with its faculty members. They get to understand how MIT comes up with inventions and patents and also its versatility in venturing into commercialisation and spurring the growth of spin-off companies.

OL aims to help the local universities and SMA itself achieve these and in time, create their own success stories.

Some OL mechanisms have been initiated, including inviting SMA staff from MIT to share their success stories to learn from and emulate; having Communities of Practice (CoPs) that encourage small-group learning and brainstorming sessions among the SMA staff; promote risk-taking and innovation among the staff while leaving them room to make errors; encourage participation and feedback of management departments in OL; and having formal teaching by experts to learn to incorporate OL concepts in their actual work practices and implementing long-term projects to gain tacit knowledge.

The Organisational Learning Working Group (OLWG)

The Organisational Learning Working Group (OLWG) was formed in September 2001. It is responsible for the development of OL strategies, the implementation of OL in which the staff are encouraged to participate and provide feedback and the refinement and improvement of the OL strategies and techniques, which include having short courses, workshops and seminars.

The OLWG comprises of Prof Andrew Nee Yeh Ching, the Co-Director, SMA (Singapore) who is the Advisor for the Working Group; NUS representatives - Prof Ng Wun Jern (Dean, Faculty of Engineering) and Ms Aw Guat Hwee (Senior Administrative Officer, Office of Provost); NTU representatives - Assoc Prof Teh Cee Ing (Head, Division of Geotechnical & Transportation Engineering, School of Civil & Environmental Engineering) and Mrs Lim Paik Suan (Deputy Director, Office of Academic Services); and SMA Secretariat Ms Rachel Tan (Administrative Officer).

The Singapore - MIT Alliance Industry Consortium

The Singapore - MIT Alliance Industry Consortium (SMAIC) was forged as a link between SMA and industry.

By raising the profile of SMA's activities in research, education and training, the SMAIC aims to spur even more activities in these areas, encourage innovation and also bring about the creative application and deployment of technology between SMA and the industries in Singapore.

Functioning as an active link between the SMA and industry, SMAIC adopts, as its terms of reference, the promotion of SMA to industry and raising awareness of SMA activities; establishing links with industry to enhance understanding of the trends in the science and technology arenas; functioning as a forum to facilitate dialogue among focus groups; promoting research collaboration between members; encouraging industry participation in major research projects initiated by SMA; and enhancing the use of advanced distance interaction; technology for joint projects and collaboration on R&D; supporting SMA activities through an industry top-up scheme, book prizes and internship.

Industries that participate in the SMAIC stand to reap member privileges that include priority registration for SMA activities, updates on relevant MIT research programmes, access to a forum for feedback and input on research direction, summaries of research progress, projects and activities, invitations to events and activities organised by SMA, networking opportunities, access to relevant MIT, NUS and NTU departments, increased interaction between industry and SMA staff/students, potential joint-projects on development of patents and new technologies, first access to students for employment, first selection for attachment to companies during internship, updates on use of advanced interactive distance education technology and priority access to future courses organised by SMA. Membership to the SMAIC is open to all the organisations in Singapore.

SMAIC members enjoy an initial two-year membership, which is subsequently renewable on a yearly basis, at a rate of S\$2,000 per annum.

Members of SMAIC currently include:

1. Chartered Semiconductor Manufacturing Ltd
2. Dou Yee Enterprises (S) Pte Ltd
3. DSO National Laboratories
4. Inmac Singapore Pte Ltd
5. Institute of Environmental Science & Engineering
6. Micron Semiconductor Asia Pte Ltd
7. PSA Corporation Ltd
8. Shell Eastern Petroleum (Pte) Ltd
9. Surromed Pte Ltd

The Board of Directors for SMAIC comprises one SMA representative each from MIT and Singapore, one EDB-SMA Industry Advisor and two representatives from industry. The SMA Secretariat is the SMA Office.

MIT Outreach Programme

Master Class in Music

SMA's technologically advanced videoconferencing facilities were utilised in what one would have previously considered impossible for the delivery of the Master Class in Music on 4 December 2001.



Professor Marcus Thompson, MIT's Robert R. Taylor Professor of Music and Margaret MacVicar Faculty Fellow, was

able to deliver his class virtually face-to-face with students in Singapore, showcasing to them intricate details in posture, positioning and fingering all the way from the other side of the globe. The gaps in time and physical space were once again bridged with the videoconferencing facilities.

The first live Master Class in Music between MIT and NUS (Singapore) via videoconferencing.

SMA was thrilled to host an event that featured the fine tuning of Professor Thompson's musical finesse together with the fine tuning of the videoconferencing facilities. SMA has successfully accomplished yet another innovative endeavour of the Interactive Distance Education Programme, with the effort and support from 60 NUS and MIT students who attended the class, the NUS Office of Student Affairs, The Centre for the Arts, the MIT Music Department and the many hours of preparation put in by the MIT and NUS technical staff.

SMA-2

With the first phase of SMA firmly established in place, plans are now underway for the second phase of SMA.

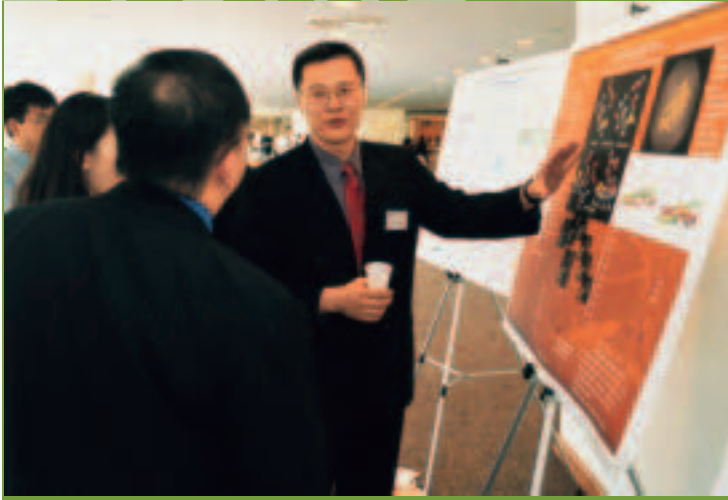
In this new phase of collaboration, SMA students will be able to earn dual postgraduate degrees. Currently, the Master's and Ph.D degrees awarded to SMA students are conferred by either of the local universities with endorsement from MIT. In SMA-2, students will be able to earn two degrees, one from MIT and the other from NUS or NTU.

The features in these second-generation programme include co-teaching in which Singapore SMA Fellows will be involved in teaching MIT students, providing SMA-2 the leverage to be on par with MIT in both research and teaching and helping it develop, in time, to be an active node for research collaboration and an Asian hub for interactive distance education.

Other items on the agenda include the intensification of the Ph.D. and postdoctoral training and research collaboration among the three universities and A*STAR research institutes and the development of close relationships with universities from China and India.

These are planned as improvements in the alliance programme, that seek to secure stronger and more in-depth collaboration between the universities and participants and a wider base of support from the MIT, NUS, and NTU communities.

Events





Commencement

SMA's second Commencement Ceremony was held on 20 July 2001. 10 students were conferred the Master of Engineering degree in the AMM&NS or HPCES programme and 59 were conferred the Master of Science degree in the AMM&NS, HPCES or IMST programme.

Annual Symposium

SMA's second Annual Symposium was held from 14 to 16 January 2002 at the University Cultural Centre of the National University of Singapore.

The audience for the Symposium included SMA Faculty Fellows from Singapore and MIT, SMA students, SMA Alumni, MIT Club Members, industry members and invited guests from some of the top universities in Asia. The participants were from the government, academia and industry.

The Symposium showcased SMA's achievements in both education and research and served as a venue for the dissemination of research results and also to stimulate further research collaboration. This year, the Symposium touched on the broader impact of global education and highlighted research projects that were undertaken in the various SMA programmes.

Highlights of the Symposium included:

- Keynote Address by Dr Tony Tan, Deputy Prime Minister and Minister for Defence, Singapore
- "A Vision of MIT's Future" by Dr Charles Vest, President of MIT
- "Human Resources for Technology & Innovation in Southeast Asia" by Dr Morris Chang, Chairman of the Board and CEO, Taiwan Semiconductor Manufacturing Company, Taiwan
- Industry Forum chaired by Mr Ko Kheng Hwa, Managing Director of Economic Development Board
- Research and Project Presentations by Faculty, Research Fellows and students from SMA
- Poster Sessions/Exhibits of Research



Seminars

Seminars that were delivered by successful entrepreneurs were held by the MIT Enterprise Forum to provide students with insights on the commercial and industrial applications of their research and even setting up business entities that promote these applications. These seminars touched on topics including product design and development, marketing, sales, entrepreneurship, investment banking, venture capital and law.

Seminars that were held the past year included:

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| 16 April 2002 | Cashing Out Successfully: Exit Strategies to Capture Value
<i>(Members of the panel were from Goldman, Sachs & Co., Highland Capital Partners, Saturn Management, LLC and Cortek, Inc.)</i> |
| 6 June 2002 | Winning in the Marketplace: Successful Entrepreneurs Tell How They Did It
<i>(Members of the panel were from Captive Network Inc., MarketSoft Corporation, Keurig Inc. and Color Kinetics Inc.)</i> |

Industrial Liaison Programme

Talks and seminars that touch on a wide range of topics, from the economic recovery in the Asia Pacific region to the genetics and technology were successfully held for the SMA staff and students.

Seminars held under the Industrial Liaison Programme included:

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| 28 November 2001 | Gene Expression in Mammalian Cells: RNA Splicing and Silencing by siRNAs
<i>(by Dr Phillip A. Sharp, Nobel Laureate, Institute Professor, Director of the McGovern Institute for Brain Research, MIT Department of Biology.)</i> |
| 21 February 2002 | Ingredients for Global Economic Recovery and Implications for the Asia/Pacific Region
<i>(by Professor Lester Thurow, Jerome and Dorothy Lemelson Professor of Management & Economics, Dean Emeritus and Coordinator, Asia-Pacific Initiatives, Sloan School of Management.)</i> |
| 17 April 2002 | Technology Innovation In a New Asia via videoconferencing
<i>(Members of the panel were from Economic Development Board, Chartered Semiconductor Manufacturing and MMI Holdings Ltd in Singapore and Center for International Studies, MIT Entrepreneurship Center and International Management Behavioral Policy Science in MIT.)</i> |



Recruitment

Presentations

In October 2001, SMA held presentations to the final-year undergraduates at NUS and NTU.

Roadshows

SMA organised numerous roadshows to introduce its programmes and seek out the best talent from around the regions. From September to December 2001, it held roadshows in China, India, Malaysia, Philippines, Sri Lanka and Vietnam, which attracted many applicants from these countries.

Exhibitions

In October 2001, SMA participated in the China Education Expo 2001 in Beijing and Shanghai, China.

In March 2002, SMA participated in the Education India 2002 Exhibition and Conference in New Delhi, India.

Visits by Institutions

Delegates from distinguished universities and technological institutions in Europe, Korea, Japan and China have visited SMA over the past year to learn more about the programmes offered in SMA.

2001

FEB	1	A visit by the Duke University and Ms Marianne Risley of Pratt School of Engineering was made to SMA office. They were welcomed by Prof Chua Soo Jin.
JULY	4	Hiro(omi) Homma of Toyohashi University of Technology, Ryoichi Nambu of Social Development Co-operation Department and Satoru Takahashi of Educational Development from Japan came to find out more about SMA.



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| JULY | 9 | A delegation from Fudan University led by Prof Yang Yu Liang, Vice President and Prof Jiang Yi Hua, Dean of School of Humanities visited NUS and SMA. |
| | 10 | Prof Ioan Alfred Letia from the Department of Computer Science, Technical University of Cluj-Napoca, Romania visited SMA. |
| | 13 | A delegation from Matsushita Communication Industrial (MCI) led by Yasuyuki Suzuki, Chief Executive Engineer came to understand SMA's research effort and programmes. |
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| SEP | 19 | PRC media journalists visited SMA and had a discussion with Prof Chua Soo Jin after the video presentation. |
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| OCT | 16 | A delegation from the Seoul National University, Korea visited NUS and SMA. Prof Chua Soo Jin met Mr Seo Nam-Soo, Director-General for University Supporting Bureau and Mr Kim Doh-Yueon from the College of Materials Science & Engineering. |
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| NOV | 29 | SMA hosted a visit by Dr Chun Soung Soon, Chairman of The Presidential Advisory Council on Science & Technology, Korea. Dr Chun met up with Prof Hang Chang Chieh, Prof Chua Soo Jin and a team from Faculty of Engineering, NUS. |
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| DEC | 3 | SMA welcomed three visitors from Japan - Prof Niyama from Tokyo Institute of Technology, Dr Nishihara from Education Technology Development Center (TITech) and Mr Teraoka, JICA Expert of NSTDA. These visitors also interviewed some students and had the opportunity to observe a lecture via videoconferencing. |
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