FACTSHEET

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About NTU’s IDM capabilities

The schools in NTU with the most significant amount of ongoing or new Interactive & Digital Media (IDM) activity are:

1) School of Electrical and Electronic Engineering (EEE)
2) School of Computer Engineering (SCE)
3) School of Communication and Information (SCI)
4) School of Art, Design and Media (ADM)
5) School of Humanities and Social Sciences (HSS)
6) National Institute of Education (NIE)
7) School of Mechanical and Aerospace Engineering (MAE)

Name of School : School of Electrical and Electronic Engineering (EEE)

Type of Degrees/Diplomas offered : Bachelor of Engineering (EEE) with specialization in the following:
  Digital Media Processing
  Computer Engineering
  Communications
  Infocommunication
  Graduate Diploma in Information Communication Technology
  Master of Engineering
  Master of Science (Signal Processing)
  Master of Science (Communication Engineering)
  Master of Science (Communication Software & Networks)
  Doctor of Philosophy

Key IDM-related Research Areas/Projects : Multimedia Processing Research Group
  - Image and Video Coding
  - Multiple Description Coding
  - Content-based Media Analysis
• Image and Video Indexing and Retrieval
• Image/Video Interpolation, Demosaicking and Super-resolution
• Image/Video Denoising and Artifact Removal
• Image/Video Segmentation, Classification and Summarization.
• Scalable Multimedia over Networks
• Media Adaptation and Streaming
• Mobile & Pervasive Media Processing

Digital Signal Processing Research Group
• Audio Beam System and Applications
• Active Noise Control for Headsets
• Virtual Surround Sound System using Two Speakers
• 3D Sound System
• Power Management for Embedded System
• Real-time Implementation of Digital Media Processing
• Audio Analysis & Synthesis via Pitch Estimation and Scaling
• Blind Source Separation and Audio Segmentation
• Audio Enhancement
• Speech Enhancement & Recognition

Media Communications Research Group
• Cross Layer Optimization for Multimedia Multi-hop Wireless Network
• Advanced Routing Techniques for Mobile Ad Hoc Networks
• Mobile Ad Hoc network Protocol Design with Multiple Channels
• Control of Traffic for QoS in Next Generation IP Networks
• Modeling and Performance Analysis of Jitter Index for Layered Video over IP networks
• Scalable Quality of Service (QoS) over Broadband Internet and Next Generation Mobile Network
• Protocol Design and Performance Analysis for Mobile Ad Hoc Networks

Centre for Signal Processing
• Intelligent Human-Machine Interface through Audio and Imaging (Video & IR) Sensor
• Intelligent Video Surveillance
• Smart Audio Surveillance
• Space-Time Signal Processing using Sensor Array
• Perception/Content based Analysis for Video Coding and Indexing
• Audio-Visual Enhancement and Human Understanding System
• Embedded Reconfigurable Multimedia Signal Processor
• Advanced Detection and Localization Algorithms for a Randomly Distributed Acoustic Sensor Network
• Beamforming for 4G Communications
• Beamforming for In-Vehicle Speech Detection and Recognition
• Perceptual Image Processing and Evaluation

Centre for Information Security
• Digital Watermarking
• Copyright Protection
• Authentication of Image and Document.
• Fingerprint Verification
• Face Recognition
• Multimodal Biometrics
• Digital Rights Management

Positioning and Wireless Technology Centre
• Software GPS and Galileo Receivers
• Ultra Wideband Devices
• Scalable Localization and Positioning Systems
• Radio Frequency Identification
• WiFi and WiMAX Based Indoor Positioning Systems
• WiMAX Testbed

IDM Resources (facilities and labs)
• Digital Signal Processing Lab
• Computer Engineering Lab
• Media Technology Lab

Name of School : School of Computer Engineering (SCE)

Type of Degrees/Diplomas offered : B.Eng (Computer Engineering/Computer Science)
Double Degree in Business and Engineering (B.Bus and B.Eng (Computer Science))
Key IDM-related Research Areas/Projects:

- Infrastructure: AE@SG: Digital Media Grid.
- National Grid Project: Drawing and Animation over the Grid and Computer Assisted Cel Animation (CACAni).
- Project TRACEA: Localisation using camera in urban areas.
- SmartEye: An Embedded Camera System.
- Virtual Worlds and Intelligent Agents for Learning Science: Innovative Technology and Pedagogy for Singapore Schools.
- Imaging and Restoration Approaches for Hierarchical Archives.
- Collaborative Creation and Application of Interactive Digital Media Over the Internet.
- Collaboration with media company 2XL on developing trained manpower by supporting Master of Engineering (Game Development).

IDM Resources (facilities and labs):

- Interaction and Entertainment Research Centre (IERC)
- Game Lab (gameLAB)
- Centre for Advanced Information Systems (CAIS)
- Centre for Advanced Media Technology (CAMTech)
- Centre for Multimedia & Network Technology (CEMNET)
- Centre for Computational Intelligence (C2I)
- Emerging Research Lab (ER Lab)
- Forensics and Security Lab (ForSe Lab)
- Parallel and Distributed Computing Centre (PDCC)

Name of School: School of Communication and Information (SCI)

Type of Degrees/Diplomas offered: Bachelor of Communication Studies

Graduate by Research
PhD in Communication Studies
Master of Communication Studies
Master of Applied Science

Graduate by Coursework
Master of Mass Communication
Master of Science in Information Studies
Master of Science in Knowledge Management
Master of Science in Information Systems
Graduate Diploma in Mass Communication

Key IDM-related Research Areas/Projects:
- Reusable Learning Objects project
- Summarisation
- Information Mining and Retrieval

IDM Resources (facilities and labs):
- Asian Media Information and Communication Centre
- Electronic Media Studio
- Computer-Assisted Telephone Interview system (CATI)
- Asian Resource Communication Centre (ACRC)
- Usability Lab

Name of School: School of Art, Design and Media (ADM)

Type of Degrees offered:
- BFA (Digital Animation)
- BFA (Digital Filmmaking)
- BFA (Photography and Digital Imaging)
- BFA (Interactive Media)
- BFA (Product Design)
- BFA (Visual Communication)

(scheduled for 2007):
- MFA Digital Arts
- MD Design

(scheduled for 2008):
- PhD

Key IDM-related Research Areas/Projects:
- Merging Cinema with New Technologies
- Environmental Media
- Digital Imaging for 21st Fine Art Editioning
- A Low-Budget All-Digital Production Pipeline
- Telematic nomadology: locative media in the city, design, and scenography
- Live Robotic Interactive
Environments
• Tradigital Mythmaking, Singaporean Animation for the 21st century
• Integration of Communication Technologies in Everyday Wear

IDM Resources (facilities and labs): 8 labs/studios
Digital Creative Centre in formation; part research centre, think-tank and production centre

Name of School: School of Humanities and Social Sciences (HSS)
Type of Degrees/Diplomas offered:
- BA (Eng Literature)
- BA (Economics)
- BA (Sociology)
- BA (Chinese)
- BA (Psychology)
- MA (Eng Lit)
- MA (Sociology)
- MA (Chin)
- MA (Psy)
- Doc in Philosophy (Econ)
- Doc in Philosophy (Chin)
- Doc in Philosophy (Psy)
- Doc in Philosophy (Eng)

Key IDM-related Research Areas/Projects:
• The Ultimate Commodity – from the Gopal Baratham short story. Produced for Sparks at the Esplanade
• Preliminary Research for Augmented Reality Location Based Entertainment Project: The Long Bar – Raffles Hotel

IDM Resources (facilities and labs): Collaboration with SCE’s Interaction and Entertainment Research Centre

Name of School: National Institute of Education (NIE)
Type of Degrees/Diplomas offered:
- Diploma in Education
- Diploma in Art Education
- Diploma in Home Economics Education
- Diploma in Music Education
- Diploma in Physical Education
Graduate Diploma in Education

MA (Applied Linguistics)
MA (Applied Psychology)
MA (Educational Management)
MA (Instructional Design and Technology)
MA (Social Studies)
Master of Education
MS (Exercise and Sport Studies)
MS (Life Sciences)
MS (Mathematics for Educators)

Doc in Philosophy (Education)
Doc of Education

Key IDM-related Research Areas/Projects:

IDM enabled literacies and pedagogies, such as games for learning, intelligent agent based innovative learning environment, online society, etc. Some proposals include:

- Games for National Education
- Developing Students' Critical Understandings of Film and Video as a Communicative Medium
- Worlds of Possibility: A Design-Centred Approach to Teaching and Learning Game Development
- Telling Cultural Stories using Machinima
- Ubiquity and Immersion in Educational Games
- Language and Multimodality: An Intervention Project
- Games & Cultural Perspectives: Designing Games to Illustrate Cultural Contrasts
- Alchemist Academy: Expanding Options for Game-Based Learning of Chemistry
- Embodied Learning through Agent-Augmented Interactive Games Contextualized in 3-D Chinese Painting
- Research and Development of Virtual Participatory Simulations for Science as Systems Learning
- A Multi-scale, Multi-modality Analysis of Collective Dynamics using Computational Agent-based Modeling
- Community-Embodiment based onLine Learning Systems (CELLS)
- Generative Design and Next-Generation Classroom Networks
- Embodied Understanding: Constructing Learning Experience
Within A Multi-User Virtual Environment

- GroupScribbles: Flexible Collaboration for Interactive WhiteBoard (IWB) Classrooms
- Singapore Digital Historical Inquiry Project

IDM Resources (facilities and labs): Learning Sciences Lab (LSL) which is dedicated to IDM and learning sciences research

Name of School: **School of Mechanical and Aerospace Engineering (MAE)**

Type of Degrees/Diplomas offered:
- BEng(Mech) including specializations in Design and Mechatronics
- BEng(Aero)
- Master of Science
- Master of Engineering
- Doctor of Philosophy

Key IDM-related Research Areas/Projects:
- Research Areas:
  - Virtual Reality and Soft Computing
  - Human Factors Engineering
  - Smart Product Design and Modeling
  - Intelligent Machines and Entertainment
  - Sensors and Actuators
  - Grid Computing & Engineering Applications
  - Parallel Computing
  - Intelligent Computing Systems

IDM Resources (facilities and labs):
- Visual Immersive Projection (VIP) room is equipped with high fidelity projection system, 16 sensor motion capture system, and SGI supercomputers.
- Centre for Human Factors Engineering
- Robotic Research Centre
- Advance Design and Modeling Lab equipped with supercomputing facilities

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