Interactive & Digital Media and Its Future

Ryohei Nakatsu
Interactive & Digital Media Institute
National University of Singapore

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Introduction to IDMI

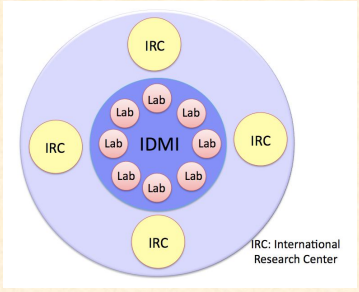
Interactive & Digital Media Institute

- Established in April 2007
- Leveraged on the diverse and growing research strength of Science, Computer Science, Engineering, Arts & Social Sciences, Performing Arts, Medicine and Architecture.
- As an interdisciplinary research entity within NUS – an intersection where technologists, artists and social scientists collaborate on research in Interactive & Digital Media.

Broad Research/Application Areas In IDMI

- **Entertainment**
- **Education**
- **Healthcare**
- **Tourism**
- **Homeland Security**
- **Arts & Culture**

Structure of IDMI



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8 Core Laboratories in IDMI

1. Mixed Reality (Lab Director: A/Prof Adrian Cheok)
2. Social Robotics (Lab Director: Prof Sam Ge)
3. Games (Lab Director: Dr Alexander Nareyek)
4. Ambient Intelligence (Lab Director: Prof Lawrence Wong)
5. Multimedia Sensing (Lab Director: Prof Mohan Kankanhalli)
6. Social & Cognitive (Lab Director: A/Prof Millie Rivera)
7. Arts & Creativity (Lab Director: A/Prof Lonce Wyse)
8. Multimodal Analysis (Lab Director: A/Prof Kay O'Halloran)

These core labs will collaborate with several Joint International Research Centers sponsored by the Media Development Authorities of Singapore

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Mixed Reality Lab

•Mission

•Pioneering Mixed reality and related advanced human computer interface research that will lead to development of IDM platform technologies.

Main Research Thrusts

- Mixed reality learning and entertainment systems
- Social and physical interactive media
- Novel communication technologies

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Social Robotics Lab

- **Mission**
- A leading laboratory in integrating robots into the social fabrics of the society.

- **Main Research Thrusts**
- Robotics for Education and Entertainment
- Humanoid Simulator for Medical Practice
- Elderly care, Childcare and Healthcare
- Human-Machine Interfaces & Interaction
- Immersive Interactions

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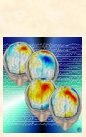
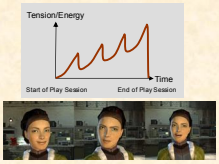
Games Lab

•Mission

•Pushing the boundaries in electronic gaming, focusing on new kinds of user experiences and ways to play games, as well as innovative production approaches





•Main research areas

- Automated story generation
- Procedural character generation
- Assessing/modeling/influencing the player's mental and emotional state
- Serious Games

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Ambient Intelligence Lab

- **Mission**
- To develop innovative sentient systems and environments for use-inspired IDM applications

Main Research Thrust

- Cognitive Sentient Platforms – modular & scalable to maximize re-usability & rapid prototyping
- Urban Sensing - good resolution localization for both indoor and outdoor situations, participatory sensing
- Live Spaces (POEM) – sentient environment, location awareness, 3D object tracking, virtual world
- iExplore – 3D scene modeling, virtual architecture

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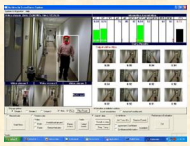
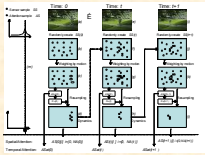
Multimedia Sensing Lab

- **Mission**
- Enable the information-centric approach to handling of live and archived multimedia data streams.





- **Main Research Thrusts**
- Active Multimedia Sensing
- Multimedia Event Capture through Sensors & Context
- Multimedia Event-handling Middleware
- Multimedia Event Presentation

Social and Cognitive Lab

- **Mission**
- Explore IDM's impact on individuals and social groups, and their impact on IDM
- Understand factors affecting users' engagement with IDM

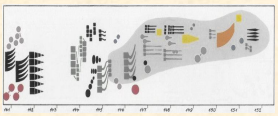
- **Main Research Thrusts**
- Online communities
- Ethical implications of serious gaming among youth
- Mobile devices, format, content and media engagement
- Techno-culture in developing countries
- Interactive and digital literacy

Arts and Creativity Lab

- **New Musical Expression**
- Instruments and interfaces
- Networked musical ensembles
- Transcoding (sonification, visualization, haptification)
- Psychological and neurological mechanisms of musical experience

- **Media Creativity Tools**
- Interactive Narrative
- Authoring tools

- **Artist Studio**
- Artists-in-residence
- Gallery/installation space



Multimodal Analysis Lab

- **Mission**
- Undertake fundamental research for the analysis, search and retrieval of information from images, video texts and interactive digital media sites.

- **Main Research Thrusts**
- Multimodal analysis of events and knowledge
- Prototype software development for multimodal analysis
- Advance relations between IDM and ways of thinking

External Research Projects

•Each IDMI Laboratory should stand on its own foot by getting external grant.

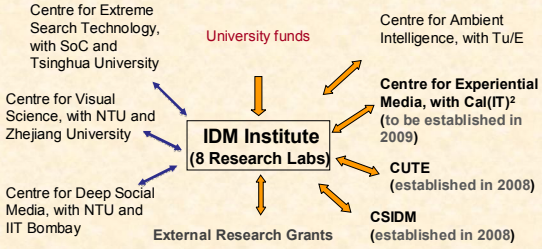
•IDMI has successfully partnered academic staff from different NUS departments to obtain external research project funding from MDA, MOE and other agencies.

•The total external grant administered by IDMI is about S$17 millions over a 3-year period.

Joint International Research Centers (IRCs)

- IDMI is a major Singapore partner in several new joint international research centers.

- Two IRCs have started their activities.
  - **CSIDM**
    - China Singapore Institute of Digital Media (CSIDM) by Chinese Academy of Sciences, Institute of Automation (CASIA) and MDA;
    - MDA, NUS and CASIA will co-fund a total of S$20M over a 5-year period.
  - **CUTE**
    - Keio- NUS CUTE (Connective Ubiquitous Technology for Embodiments) with Keio University
    - MDA, NUS and Keio University will co-fund a total of S$20M over a 5-year period.



Future Direction of IDM

- We already have almost everything we want.

Technologies and Our Life

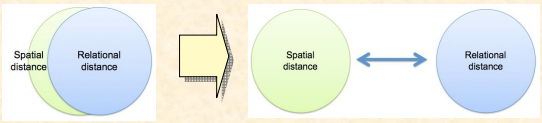
- The role of technologies has been providing people material satisfaction.
- Now people seem to be satisfied with what they already have.
- It will become more and more important for technologies to realize mental satisfaction.

Several Issues for IDM Direction

- Communications
- Entertainment
- Network society
- Culture

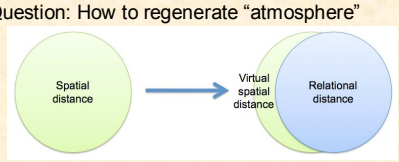
Communications

- Human relations and spatial distance were closely connected.
- Because of the network, these two are separated now.



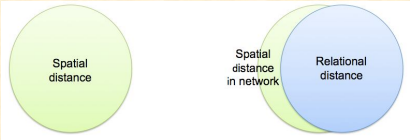
How to Cope with This (1)

- Method 1: To reduce the distance of these two by technologies
- Examples: Video conference, Virtual reality, Telexistence, etc.
- Question: How to regenerate “atmosphere”



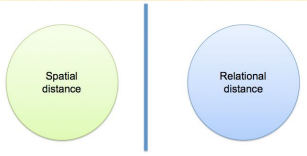
How to Cope with This (2)

- Method2: Construct a new concept of special distance in network
- Examples: Social network, Web 2.0, etc.



How to Cope with This (3)

- Methods3: Neglect the spatial distance and search new communication way using network
- Examples: Wikipedia, etc.
- Question: How to realize network (collective) creativity

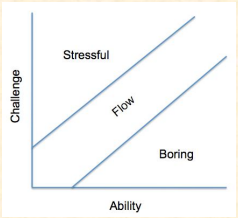


Entertainment

- Digital entertainment has become more and more popular.
- *Interactivity* is the source of the power for such entertainment.
- But still we don't know its full power nor how to utilize the power.

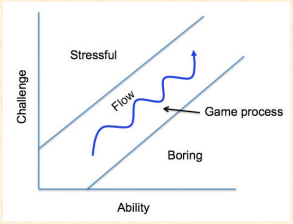
Flow and Interactivity

- Interactivity easily leads people into flow



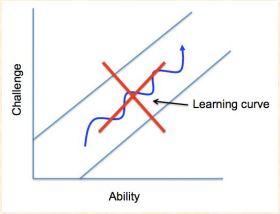
Games and Flow

- Most of good games apply this theory well.



Serious Games and Flow

- Unfortunately so far in most serious games learning curve does not follow this theory.



Network Society & Human Behaviors

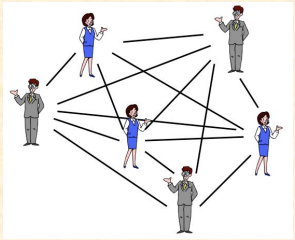
- Human behaviors are changing especially in Western countries.
- Examples
  - People like to take photos anywhere, anytime.
  - People like to communicate with their familiar persons anytime, anywhere.
  - People like Japanese animations, comics, etc.
- Are westerners' behaviors Asianized?

Why?

- Probably there are two major reasons.
- Network
- Media

Network Society

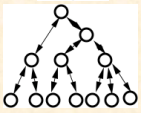
- Everybody connected all the time through networks.



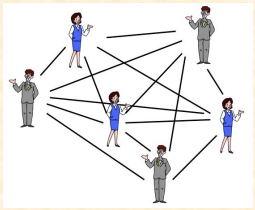
Network Society

- Aren't we going back to the old times?

Greek Society

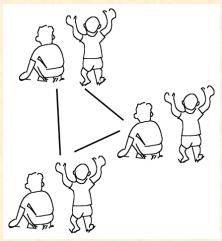


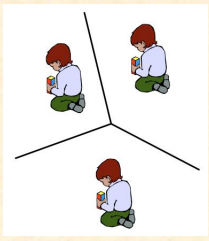
Modern Society



Network Society

Asian Culture v.s. Western Culture





Great Inventions in Media History

- Invention of written characters
- Invention of printing typography
- These inventions made people literal brain dependent, especially in western countries.