



 Grenoble INP



International Research Institute MICA
Multimedia, Information, Communication & Applications
Eric Castelli - French director
Nguyen Viet Son – Vietnamese director

International Research Institute MICA
 Multimedia, Information, Communication & Applications
 UMI 2954
 Hanoi University of Science and Technology
 1 Dai Co Viet - Hanoi - Vietnam

MICA Institute – UMI2954



Context

- Created in 2002 as joint laboratory
 - ◆ → UMI 2954 since 1st January 2006
- Located in



Đại học Bách khoa Hà nội
 Hanoi University of Science and Technology
 Institut Polytechnique de Hanoi

 - ◆ The biggest and the best university in S&T in Vietnam
 - ★ Grouping of 17 Engineering Schools
 - ★ ~ 42,000 students
 - 25,000 engineers, 12,000 technicians & over 5,000 Masters and PhDs
 - ★ 2,000 staff, including 1,500 teachers/researchers
 - ★ MICA is one of eight research institutes of HUST
- French “tutelles”
 - ◆ CNRS: InS2I, InSIS, InSHS

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Fields of research



- Using Information Technology tools

- ◆ to meet the needs, expectations and wishes of users **as closely as possible**

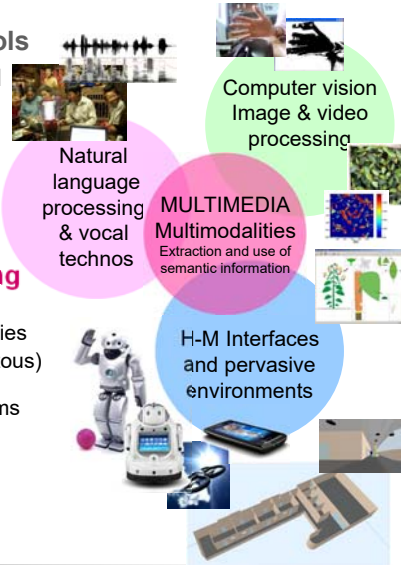
- “User-centered” approach

- ◆ “user-adapted” computing

- Multimedia and ambient computing

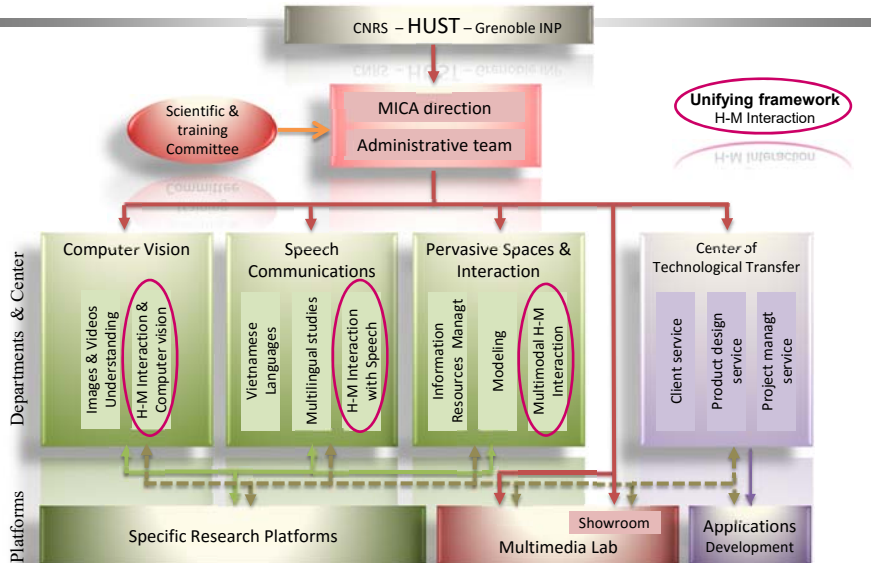
- ◆ Multimedia
 - ★ speech, images/videos, multimodalities
- ◆ Ambient computing (pervasive, ubiquitous)
 - ★ advanced instrumentation; human-system interfaces; embedded systems

- Goal:** to define and promote new services and new practices



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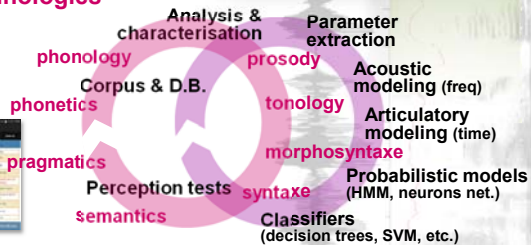
MICA structure



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Department Speech Communications

- Fundamental Research**
 - Linguistics, phonetics, phonology
 - Prosody and tones
- Development of vocal technologies**
 - Speech synthesis, automatic recognition, automatic translation



- MICA is the only lab in Vietnam studying both aspects simultaneously**
- ¶ languages (under-resourced and endangered languages)**
 - Khmer, Lao
 - Minority dialects of Vietnam

Minorities
H-Mong
Mo Piu



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Department Speech Communication Studied languages



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Department Computer vision

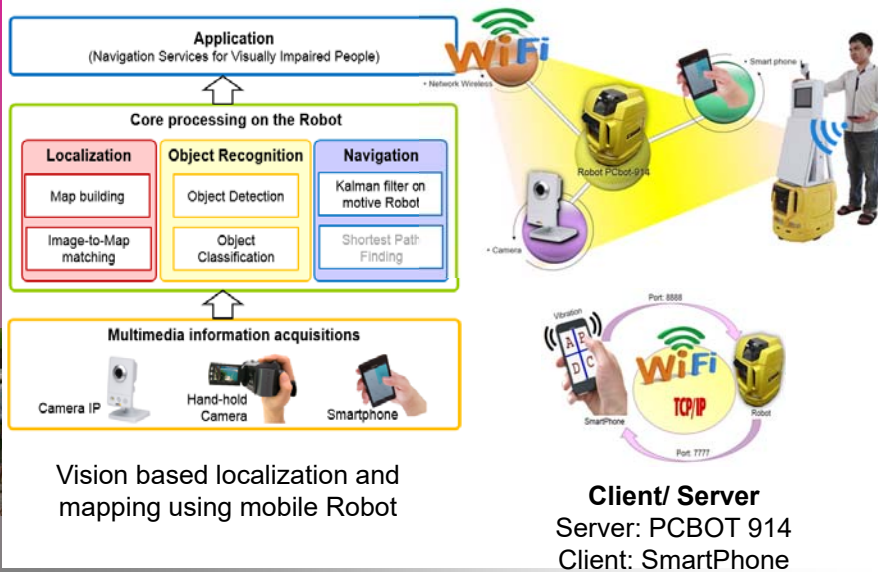
- **Objectives** Allow the machine:
 - ◆ “see” and “perceive” what is present in the pictures and what is happening in the videos.
 - ★ Object detection/recognition in fix images
 - Chinese characters, Nôm characters in granit stela, Defaults in woven textiles, Plants, ...
 - ★ Tracking moving objects in video.
 - ★ Recognition of activities in video
 - ◆ “interact” with users
 - ★ Analysis of behavior of the user during interaction with the machine
 - ★ Recognition of gestures, postures, facial expressions, etc.
- **Two main research axes:**
 - ◆ Interpretation of the content of images and videos
 - ◆ Human-machine interaction based on vision
- **A focus on Vietnamese applications**



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Department Computer Vision – one example

Navigational aids for visually impaired using mobile robot



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Department Pervasive Spaces & Interaction

Pervasive Spaces & Interaction
Information Resources Managt
Modeling
Multimodal H-M Interaction

- Information technologies and multimedia are powerful enough to allow a **new approach** in the managements of environments
- Study of perceptive and pervasive environments
 - Room → building → area → district → city, etc.
- Study of multimodal interaction
 - Human-machine → human-complexe systems



MICA building



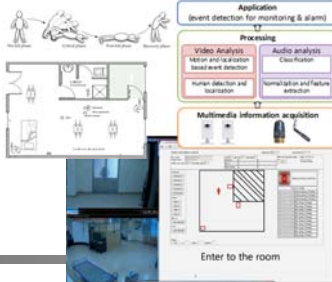
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Departement Pervasive Spaces & Interaction - applications

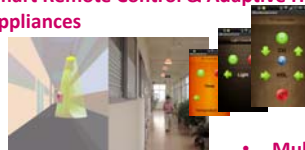
- Aids for Visually Impaired People in Navigation and Finding Objects



- Abnormal event detection for monitoring systems



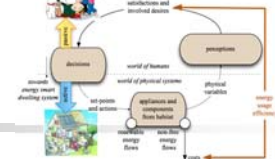
- Smart Remote Control & Adaptive Home Appliances



- Multimodal Interaction and Navigation Guidance for Autonomous devices or devices



- Efficient management of Energy building consumption



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Center of Technological Transfer & Applications

- **Main objectives**
 - ◆ Prototypes development
 - ★ For MICA researchers → research prototypes
 - ★ For Vietnamese industrials → industrial prototypes
- **Create new industrial partnerships**
 - ◆ Dissemination MICA research results
 - ◆ Center of TT → a bridge between MICA researchers and companies



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Some figures



- **89 persons in May 2016**
 - ◆ 51 persons = researchers (permanents, postdoc, PhD and masters) + admin staff
 - ◆ 38 engineer student internships
- **PhD**
 - ◆ 27 completed PhD
 - ◆ 15 PhD in progress
- **Over 1,250 scientific publications**
 - ◆ 55 % = books, journal articles, and conferences
- **73 research projects**
 - ◆ MICA leader of 54 projects
 - ◆ 60 completed projects and 13 projects in progress
- **International cooperation with over 100 international partners from 24 countries**
 - ◆ MICA received over 50 invited researchers
- **23 R&D projects with industrials**
- **MICA = H-Q research spot**
 - ◆ In Vietnam but also in South-East Asia

14 nationalities

Vietnam, France, Cambodia, Laos, China, Malaysia, Cameroon, U.S., Switzerland, Madagascar, Romania, Canada, Algeria



<http://www.mica.edu.vn>

Nguyen Viet Son, Vietnamese co-director
Eric Castelli, French co-director, UMI director

MICA 2016



INTERNATIONAL MASTER PROGRAM Ambient Computing, Multimedia & Interaction

<http://acmi.mica.edu.vn>

After this master, you will be able to **understand** the main ideas and key issues in *ambient computing, multimedia information processing, speech and image/video processing context-aware, sensors and sensor network, human-machine interaction* to **propose** solutions to handle these issues, to **imagine and conceive** new applications in this field; and to **participate in innovation** in Vietnam and Asia.

INTERNATIONAL MASTER Ambient Computing, Multimedia & Interaction

International Research Institute MICA - Hanoi University of Science and Technology
 1 Dai Co Viet - Hanoi - Vietnam

2016 : **completed** projects



- **DoReMiFa "Données des Recherches linguistiques de Michel Ferlus en Asie du sud-est"**
 - ◆ Funded by the MESR/BSN
 - ◆ Partners : LACITO (France), **MICA** (Vietnam)
 - ◆ Digitalization/collection of linguistic data from 40 ethnic languages of the area



- **VOVA "**
 - ◆ R&D project with **SAMSUNG** Vietnam
 - ◆ High quality Vietnamese TTS engine for Android



- **Some advanced statistical learning techniques for computer vision**
 - ◆ Funded by NAFOSTED (Vietnamese agency)









- **Abnormal situation detection with Kinect device**
 - ◆ Funded by MOST (Vietnamese Ministry of Science and Technology)



- **Development of an optimal path-finding system with application in aiding blind people navigation**
 - ◆ Funded by MOET (Vietnamese Ministry of Education and Training)

2016 – 2017 : ongoing projects

- 
 - ◆ **ANR Himalco** Parallel Corpora in languages of the Greater Himalayas
 - ★ Funded by ANR Program "Corpus, données et outils de la recherche en sciences humaines et sociales"
 - ★ Partners: CRLAO (France), HTL (France), LACITO (France), **MICA** (Vietnam)
- 
 - ◆ **Geometric scene analysis** as a navigational aid to the visual impaired
 - ★ Funded by NAFOSTED-FWO (Vietnam)
 - ★ Partner : **MICA**, Blind Pupils School of Hanoi (Vietnam)
- 
 - ◆ **Rice seed assessment** using advanced image processing techniques and machine vision tool
 - ★ Funded by Belgian CUI Research program
 - ★ Partners: Hanoi University of Agriculture (Vietnam), **MICA** (Vietnam), Thai Binh Seeds Cooperation TSC (Vietnam)
- 
 - ◆ **Medicinal Plant Identification** and Collaborative Information System
 - ★ Funded by the AUN/SEED-Net Program
 - ★ Partners: **MICA** (Vietnam), KMITL (Thailand), Osaka University (Tokyo), Vietnam Forestry University (Vietnam) - MICA leader
- 
 - ◆ **ShootMyMind** "The first Natural-Language-2-video system"
 - ★ Funded by the STIC-ASIE program
 - ★ Partners: **MICA** (Vietnam) - **JFLI** (Japan) - NII (Japan) - LIG (France) - GIC/ITC (Cambodia) - D3I/HUST (Vietnam)
- 
 - ◆ **SIM-Cities**
 - ★ Funded by the STIC-ASIE program
 - ★ Partners: INRIA (France), **MICA** (Vietnam), ITSI (Japan), Shanghai Jiao Tong University (China), Nanyang Technological Univ (Singapore), NUS (Singapore) - IRCCyN (France)
- 
 - ◆ **VIPPA** "Visually Impaired People Assistance using multimodal technologies"
 - ★ Funded by the VLIR program (Belgium-Vietnam)
 - ★ Partners: **MICA**, Blind Pupils School of Hanoi & Danang Univ (Vietnam), IMEP-LAHC & LIG/PRIMA (France), Ghent Univ (Belgium)

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Exchanges and actions scheduled in the framework of AURA

■ Exchanges **MICA** ↔ **JFLI**

◆ **ShootMyMind**

★ Objectives



- The first **Natural-Language-2-video** system
 - Starting from a hand written scenario, the system gathers relevant videos and helps the user to stitch existing contents by a multimedia approach
 - To propose a smarter way to search in the video databases
 - Not just keywords and some poor filters
 - We propose to start from the natural language in order to generate complex video queries

★ Partners

- **MICA** Institute, Hanoi, Vietnam - **JFLI**, Tokyo, Japan - NII, Japan - LIG, France – GIC/ITC, Cambodia - D3I/HUST, Vietnam

★ Working meetings and missions

- Kick-off meeting: June 2015 in Hanoi
- Mission NII → MICA, November in Hanoi
- 2nd meeting: December 2015 in Tokyo
- Mission MICA → JFLI, November 2016 in Tokyo → **Aura**
- 3rd meeting: November 2016 in Phnom Penh
- Final meeting: April 2017 in Grenoble



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Submitting projects

- MELISSA → Submitted to AFD



A platform for rapid prototyping of ASEAN under-resourced languages with applications for social and economic development



- CAMELIA Computer Aided Mobile Exchanges using Language Interaction for ASEAN



→ will be submitted to Horizon 2020 ICT-39-2017 program



MICA 2016

Industrial coop and R&D projects



- MICA member of the **French Tech Vietnam**
 - ◆ EC member of the steering committee and one of the Ambassadors of the French Tech Hub



- Participation of LINAGORA and UNIITY

- ◆ MELISSA project



- MUSEUM project

- ◆ With UNIITY



- Discussion in progress

- ◆ Softbank Telecom (Vietnam branch)
 - ★ Realization of a speech processing toolkit for NAO robot



- ◆ Start-up incubator/accelerator
 - ★ hosted by MICA
 - ★ Managed by Unity/Pentalabbs (Pentalog) and MICA

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Last events

■ MICA co-organised SLTU'16

- ◆ The 5th International Workshop on Spoken Language Technologies for Under-resourced Languages
→ 09-12 May 2016 – Indonesia

www.mica.edu.vn/sltu2016



■ MICA organized

- 09-10 May 2016 – Hanoi, Vietnam
- Connected to the ASEAN-EU STI Dava 2016



Workshop on ICT Research and Innovation for Sustainable Economic and social development in ASEAN



www.mica.edu.vn/RISE2016

MICA 2016

HUST 60th anniversary



■ Science & Technology exhibition

3D rendering of an exhibition booth for HUST 60th anniversary. The booth features several informational panels and displays. A yellow circle highlights a specific area on the booth. A pink MICA logo is overlaid on the image with an arrow pointing to the highlighted area.

Informational panels include:

- HỆ THỐNG TRẢ CƯỚC BA PHƯƠNG THỨC LẤY THUỐC NHẼ NHÀ TRÊN THIẾT BỊ DI ĐỘNG** (VEN MICA)
- HỆ THỐNG ĐIỀU KHIỂN THIẾT BỊ TRONG NHÀ ĐIỀU KHIỂN THÔNG MINH NHÀ** (VEN MICA)
- MÁY PHÁT TIN HIỆU, MÁY HIỂN SÁNG ĐIỀU KHIỂN BẰNG TIẾNG NÓI** (VEN MICA)
- HỆ THỐNG ĐIỀU KHIỂN THIẾT BỊ TRONG NHÀ ĐIỀU KHIỂN THÔNG MINH NHÀ** (VEN MICA)

Contact information for VEN MICA:

Email: venmca@hust.edu.vn
Tel: +84.4.38823887 ext.157

MICA 2016

Nominations & Awards

Congratulations

■ Nominations

- ◆ Ass Prof Tran Do Dat
 - ★ Formal Director of Speech Com. Depart. → **Ministry MOST**
- ◆ Dr Le Minh Hoang
 - ★ Director of TTA Center → **Vice-director of Secretary off. of the HUST President**
- ◆ Ms Dr Le Thi Lan
 - ★ Director of ComVis Depart. → **Associate Professor**

■ Satisficet of merit

- ◆ Dr Dao Trung Kien



■ Singing contest award

MICA bronze medal !



■ Recognition award for contribution to HUST development

- ◆ Eric Castelli



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