Pattern recognition & speech technologies (http://grah.ehu.es)

M. I. Torres, R. Justo, A. Pérez, V. Guijarrubia, J.M. Olaso, G. Sánchez, E. Alonso, J.M. Alcaide

Department of Electricity and Electronics. University of the Basque Country. Spain

`manes.torres@ehu.es`

Abstract

The Pattern Recognition & Speech Technology group (PR&ST) is devoted to the research and technological development in areas related to pattern recognition and speech and language technologies. We are also aimed to advise PhD students, to train technical experts and to transfer technology to companies.

1. Introduction

The PR&ST group of the University of the Basque Country was constituted in 1990. The work carried out in the group was mainly focused on technologies based on machine learning for Automatic Speech Recognition (ASR) systems. However, other fields such as speech understanding and dialogue systems have also been considered. In the last years we have also worked to adapt recognition systems to real working conditions, specially treating spontaneous speech. On the other hand, alternative research lines have also been tackled in the framework of machine translation and language identification . These activities have led to the publication of numerous publications in international conferences and journals.

We have experience in collaborating on coordinate R&D projects and working with companies (Telefonica I+D, EITB, Adur Software Productions, Rosetta Testu Zerbitzuak, Fagor Electrodomésticos, Telvent, Softec, Scansoft). We have also collaborate with technological centers (Ametzagaia, Ikerlan, Cidemco) and public agencies (UZEI, Euskoiker Foundation, Linguistic Policy Ministry of Basque Government)

We have developed several demos of automatic speech recognition systems in Spanish and Basque for different tasks. On the other hand, we have acquired different text and speech corpora and language resources in Spanish, English and Basque. Finally, it is worth mentioning the development of dialogue system prototypes in the framework of R&D projects.

2. Scientific Objectives in the coming years

- Acoustic modelling techniques aimed to deal with speech variability.

- Development of hierarchical, cooperative language models. Application to recognition, understanding, dialogue and machine translation.

- Development of specific technologies for lexical processing of the Basque Language.

- Speech-to-speech translation in limited domains: model inference based on finite state transducers. Use of linguistic knowledge. Integration of ASR and translation components for systems operating in limited domains for Spanish/Basque and Spanish/English language pairs.

- Including user in the formulation of dialogue systems. Management of multimodality in models of understanding and decoding in speech-based interactive systems.

3. Technical Objectives and Technology Transfer

- Compile linguistic resources to develop the proposed technologies.

- Working spoken dialogue systems that push the envelope of naturalness and sophistication.

- Integrate multilingual and multimodal input/output in speech-based interactive systems.

- Develop advanced multimodal interactive systems in collaboration with the industrial sector to explore the creation of technology-based spin-off companies.

- One of the main goals of the group: proposal and development of doctoral thesis for phd training as well as the training of specialists in speech technologies.

4. Current projects

- SD-TEAM: "Interactive Learning. Sefl-Evaluation and Multimodal Technologies for Multidomain Spoken Dialogue Systems" (MICINN)

- MIPRCV: Multimodal Interaction in Pattern Recognition and Computer Vision (CONSOLIDER-INGENIO 2010)

- VOACDIS: "Mejora de la accesibilidad a vivienda de personas discapacitadas mediante sistemas de reconocimiento" (MICINN-Program of applied research with companies)

5. Funds

- Regional: UPV/EHU research group, EJIE/UPV agreement, Intek, Gaitek,...

- National : MICINN. CONSOLIDER-INGENIO 2010, thematic networks,...

- European: SEVENTH FRAMEWORK PROGRAM (FP7): ICT - IP Call 2008-3

- Projects to develop technology and research contracts.

Stable collaborations with first-level national and international universities and centers.

Organizers of numerous scientific meetings and events such as the **AERFAI Summer School 2008**: "New trends in Pattern recognition for Speech technologies": 7 first-level professors (6 countries), 50 european students in Science Faculty, June 2008.