

Speech understanding in dialogue systems

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Index

1. Education.
2. Professional experience.
3. Research.
4. Papers.
5. Current research interests.

Education

- 2003 - present Ph.D. student in Robust Speech Understanding in a Dialogue System. Department of Information Systems and Computation. Technical University of Valencia, Spain. Expected Graduation Date: May 2007.
- 2003 - 2005 Master of Science in Pattern Recognition and Artificial Intelligence. Department of Information Systems and Computation. Technical University of Valencia, Spain. Master Thesis Topic: Speech Recognition and Understanding in the Dihana Dialogue System.
- 2001 - 2002 Master in Networked Computer Design and Deployment. Ecole Nationale Supérieure des Telecommunications de Bretagne (ENST), France.
- 1997 - 2002 Computer Science Engineer. Faculty of Computer Science. Technical University of Valencia, Spain. Final Project Thesis Topic: Realization of a Document Recognition Platform.

Professional experience

- June 2003 - present Graduate Research Assistant in the Department of Information Systems and Computation. Technical University of Valencia (Spain).
Project Dihana: Development of a robust dialogue system for information access using spontaneous speech in different environments.
Subject: Speech Recognition and Understanding in the Dihana Dialogue System. Acquisition and labeling of a large spoken dialogue corpus in Spanish. Development of a speech understanding module. Development of a dialogue act classification module. Development of a speech recognition module using the Sphinx utilities.
- April - September 2002 Final Project Thesis in the Computer Science Department at the ENST Bretagne (France).
TeDeVi Project: E-Teaching of Palliatives Techniques for blind and partially-sighted persons
Subject: Realization of a Document Recognition Platform
State of the art on Optical Character Recognition (OCR). State of the art on Neural Networks. Implementation of the application in JAVA.

Research tasks

- The acquisition and labeling of a large spoken dialogue corpus in Spanish
- A Speech recognition module for the Spanish language using the Sphinx library
- Speech understanding modules using HMMs and statistical machine translation
- A dialogue act classification module in order to detect discourse structure

Papers

- 1) Acquisition and labeling of a large spoken dialogue corpus in Spanish:
 - “Adquisición de un corpus de diálogo en el proyecto DIHANA”. Nieves Alcácer, Ramón Granell, Sergio Grau, David Griol. Actas del Curso de Tecnologías Lingüísticas. “Preguntar al ordenador: las aplicaciones de los sistemas de diálogo”. Fundación Duques de Soria. Soria, 12-16 de julio de 2004.
 - “Diseño de un corpus de diálogo: DIHANA”. Nieves Alcácer, María José Castro, Isabel Galiano, Ramón Granell, Sergio Grau, David Griol. Actas de las III Jornadas en Tecnología del Habla. Valencia, 16-19 de noviembre de 2004.

Papers (2)

2) Robust speech Understanding:

- “Hidden Markov Models for Understanding in a Dialogue System”. Fernando Blat, Sergio Grau, Emilio Sanchis, María José Castro. Lecture Notes in Progress in Pattern Recognition, Image Analysis and Applications. 9th Iberoamerican Congress on Pattern Recognition (CIARP 2004). Puebla (Mexico), octubre 2004

Papers (3)

3) Dialogue act classification and discourse structure:

- “Dialogue act classification using a Bayesian approach”. Sergio Grau, Emilio Sanchis, María José Castro, David Vilar. Proceedings of the Ninth International Conference Speech and Computer (SPECOM 2004). San Petersburgo, septiembre 2004.
- “Clasificación de actos de diálogo usando Naive Bayes y una Gramática del Discurso”. Ramón Granell, Sergio Grau, María José Castro. Actas de las III Jornadas en Tecnología del Habla. Valencia, noviembre 2004.
- “An approach to Dialogue Act Classification based on Utterances and Dialogue History”. Ramón Granell, Fernando Blat, María José Castro, Sergio Grau, David Griol. SPECOM 2005.

Papers (4)

3) Spoken dialogue systems:

- “Sistema de diálogo para el proyecto DIHANA”. Lluís Hurtado, David Griol, Sergio Grau, Fernando Blat, Fernando García, Francisco Torres, Emilio Sanchis, Encarna Segarra. XXI Congreso de la Sociedad Española de Procesamiento de Lenguaje Natural (SEPLN). Granada, 14-16 de septiembre de 2005.
- “A dialog system for the DIHANA project” David Griol, Francisco Torres, Lluís Hurtado, Sergio Grau, Fernando García, Emilio Sanchis, Encarna Segarra. Universidad Politécnica de Valencia. SPECOM 2006 (To appear).
- “Development and evaluation of the DIHANA project dialog system” D. Griol, F. Torres, L. Hurtado, S. Grau, E. Sanchis, E. Segarra Dialogs on Dialogs Workshop. Interspeech 2006 (To appear).

Current research interests

- Automatic Speech Recognition:
 - Integration of different knowledge sources in the language model
 - Dynamic selection of language models
 - N-Best

- Robust Speech Understanding.
 - Automatic learning of segments.
 - Confidence measures.
 - Integration with the recognizer using semantic language models.

- Dialogue act classification.
 - Integration in the dialogue system.
 - Specific models for recognition and understanding.

