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LUNA Project

SPOKEN LANGUAGE UNDERSTANDING IN MULTILINGUAL COMMUNICATION SYSTEMS

OVERVIEW

The vision of LUNA project is to improve current automated telephone systems allowing easy human-machine interactions through spontaneous and unconstrained speech, overcoming the menu-driven voice recognition. The project aims to enhance the users' experience, helping the callers in using vocal services quickly and accurately.

The LUNA project is set to be at the forefront of the third generation of spoken language interfaces:

- The project will collect data from real users engaged in complex tasks such as cooperative problem solving.
- Algorithms for Spoken Language Understanding (SLU) will be investigated in order to solve such complex tasks and adapt in the context of a dialog system.
- SLU research will be validated in different domains in three languages (French, Italian and Polish).

SCIENTIFIC OBJECTIVES

A set of challenging scientific problems are being addressed in order to make Spoken Language Understanding systems more robust and capable of dealing with spontaneous speech:

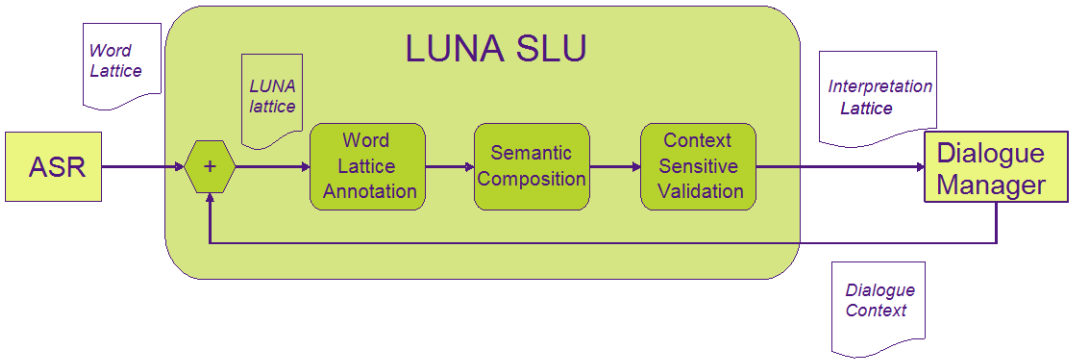
- Language Modelling for Speech Understanding;
- Semantic Modelling for Speech Understanding;
- Automatic Learning (including Active and On-Line Learning);
- Robustness issues for SLU;
- Multilingual portability of SLU components.

RESEARCH

Three levels will be considered for the SLU interpretation process:

- generation of semantic concepts for SLU - by means of translation from a word lattice to a conceptual constituents lattice;
- generation and validation of semantic structure hypotheses - through semantic composition, combination of confidence indicators and active learning;
- context-sensitive semantic validation.

LUNA is a STREP supported by funding in the thematic area Information Society Technology under the Sixth Research Framework Programme of the European Union



A specific corpus of service-related data will be collected and annotated following a protocol defined within the project. The data collection will be based both on human-human telephone conversations as well as on human-machine interactions that will range from tasks such as information seeking dialog (e.g. Warsaw bus transportation domain) to Help-Desk for SW and HW repair (e.g. Public Administration call center).

A toolkit for multilingual dialogue services will be developed, and selected modules integrated with existing voice platforms will be used to develop and field test sample applications in three languages (French, Italian and Polish).

LUNA's research results will be validated on different application scenarios, targeted to dialogue-based telephone services of different complexity, from call routing with utterance classification to dialogue systems with complex semantic domains.

IMPACT

The end result of LUNA project will be a robust technology capable of understanding spoken customer requests allowing the creation of advanced automatic telephone services.

Instead of the rigid system initiative, the deployment of Spoken Language Understanding technology can improve automation rates and shorten call times while maintaining high levels of customer satisfaction.

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