

Use and applications

The TALK consortium has agreed to follow an open-source dissemination strategy for the major parts of scientific and joint knowledge. It believes it is in the interest of all parties to release such knowledge into the public domain so that it can be properly evaluated and improved upon.

The main project results will feed into the development work of industrial developers of dialogue systems (e.g. home automation, human-machine interfaces, call-centre automation, interactive entertainment applications, interfaces to robots, interfaces for the disabled), who need generic methods and tools in order to develop better systems more quickly and economically.

Ultimately, the project results will benefit all users of commercial dialogue systems, potentially in all languages and all application domains.

New technologies developed

- Multilingual and multimodal grammars in Grammatical Framework (GF)
- Context-sensitive speech recognition
- Reconfigurable dialogue systems using ontologies
- Reinforcement Learning for dialogue management strategies
- Adaptive multimodal output

Software downloads available

- TrindiKit 4 dialogue toolkit
- GoDiS dialogue system
- ATK speech recognizer
- GF grammar development tools
- DIPPER dialogue manager

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Project information

TALK - Tools for Ambient Linguistic Knowledge

Strategic Objective: "2.5.7 Multimodal Interfaces" in the framework of IST

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TALK



Talk and Look: Tools for Ambient Linguistic Knowledge

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The TALK Project - Dialogue with technology

Buying technical devices, such as DVD-players, mobile phones or cameras nowadays almost always means making your way through complicated menus and user manuals, before you can actually start using the appliance. Wouldn't it be much better if we could simply talk to the device and tell it what we would like to do, in the same way we would talk to a person? Speech-control of this kind, which works like conversation in everyday language, is the key focus of the TALK project.

Different kinds of dialogue-systems already exist in various applications. However, the current systems only work in a narrow context and with special commands that users have to learn before they can use them. The devices provide the operation requirements and users who are not familiar with them often give up after a few tries because the system does not react as expected or even not at all.

For the researchers involved in the TALK project it is obvious that communication between human beings and complex technology can only be successful if the users can talk in their everyday language and can choose between various possibilities to interact with the system.

Therefore, the TALK project is developing flexible and robust systems for dialogue modelling in which speech (in several languages) is also combined with graphical interfaces and the conventional use of buttons. The users say what they want to say, in the way they want to say it - with short commands or complete sentences, using words they choose themselves. What is more, the systems can also learn from the process and adapt to the knowledge and the situation of the user, and can therefore be deployed for complex contexts such as in-car applications or services for the disabled in smart-homes.

In short, the TALK objectives are to:

- Develop technologies for more flexible, robust, and adaptive human-computer interaction;
- Integrate multimodality and multilinguality in dialogue system development;
- Develop easily reconfigurable and portable dialogue systems;
- Implement dialogue learning strategies, that adapt to human conversational behaviour.

Research approach

The core of the TALK dialogue systems is the "Information State Update (ISU)" approach which was developed in TALK's predecessor projects Trindi and Siridus, and is now used in many projects and applications worldwide.

While first-generation dialogue systems model dialogue processes with the help of simple graphs, the basic concept of the ISU approach is the following: all information recorded in the course of the human-computer-dialogue is saved in the "information state" of the system. At every stage the dialogue system calculates the appropriate reaction for the individual situation and updates the information state with additional information on the user, and the new context, which can then be used in subsequent communications.

The ISU technology supports the fine-tuning of the dialogue to different situations and allows efficient modelling of frequent dialogue patterns. The core of the dialogue system can be used for different languages, and graphical interfaces, and operating situations, and can therefore be easily adapted to different applications. This means that recurring requirements such as similar dialogues or tabular overviews do not have to be programmed from scratch every time but can be retrieved for different kinds of situations.

Therefore, TALK dialogue systems are not only more flexible and natural than commercial state-of-the-art systems, but the new approaches to multilinguality, reconfigurability, and learning also mean that development times and costs are reduced considerably. With TALK technologies, extending a system to new languages, applications, and additional modalities will become much more time- and cost-effective.



Benefits of the TALK systems

- Easily reconfigurable dialogue systems using ontologies
- Significant reductions in speech recognition errors, using dialogue context
- Learned dialogue strategies perform better than hand-crafted systems
- Free choice of interaction modality appreciated by 90% of users
- Good subjective ratings for multimodal content presentation

Showcase systems

- SAMMIE in-car dialogue system for an MP3 player (Saarland Univ., DFKI, BMW F&T, Bosch)
- GoDIS systems: AgendaTalk, DJ-GoDIS, TramDemo, DICO driver support (Göteborg Univ.)
- Linguamatics Interaction Manager, for the automated home environment (Linguamatics)
- HIS, tourist information system (Cambridge Univ.)
- MimusSystem, for the automated home environment (Seville Univ.)
- The TownInfo systems, for tourist information (Edinburgh Univ., Cambridge Univ.)
- Programming by voice, for devices and services (Edinburgh Univ.)

