Centre for Speech Technology (CTT)

The Centre for Speech Technology (CTT) is created as a platform for co-operation between industry and academic research within the strategically important area of speech technology. It was established in April 1996 and is planned as a long-term enterprise, concentrating on fundamental research topics of industrial relevance. CTT is a unit within the Department of Speech, Music and Hearing (TMH), controlled by a separate board. In July 2001, we entered the third stage of CTT, jointly sponsored by KTH, VINNOVA, and 15 Swedish companies and organisations.

Speech technology will no doubt become an increasingly important area within automated human machine services. The rapid development of the area during the last years has made this even more evident. One of the main goals of CTT is to build on the internationally recognised speech technology expertise at the Department of Speech, Music and Hearing at KTH and advance it for future applications in products and services. The Centre will assure that Sweden stays in the forefront of speech technology research and that Swedish will be extensively modelled for speech and language applications.

The strategy of CTT may be summarised in the following points:

- Pre-competitive long-term research is an essential task for the Centre. It is a prerequisite for other work at the Centre and will secure the knowledge base needed for the more application-oriented work pursued at the Centre.
- Participation in international projects is an important activity and indispensable in order to maintain the CTT research network and to keep the Centre updated with the current international trends.
- Co-operative work with Swedish industry and organisations for mutual knowledge transfer is a fundamental activity within the Centre. The collaboration will also offer the Centre an understanding of current industrial needs and trends. The developments of conversational systems are examples of such projects where many aspects and demands have to be integrated.
- Development of multimodal man-machine interfaces: voice-only systems that may be used over the telephone and systems with graphical interfaces including talking 3D-animated agents. The ultimate goal is to create adaptive systems, which for example adjust to the speaker, the listener, and the environment.
- Building demonstrator applications that illustrate essential new aspects of speech technology and indicate new areas where they can be employed. Efficient language training based on speech technology is one such new area in the multilingual European community. Another example is the need for speech browsing, that is, searching in the vast amounts of spoken documents in multimedia environments.
- Education and training form an integral part of the activities. CTT is engaged both in basic teaching in the MSc and graduate program and in specialised courses for persons already in the field. Both activities have high priority among our industrial partners, anticipating a great expansion of the technology area.

Research at CTT

The research activities at CTT are performed along several parallel research strands. The most important is the pre-competitive long-term research. The research at CTT initially includes the following five areas:

- *Speech technology in interactive dialogue systems.*
  Goal: To integrate speech technology in advanced interactive demonstrators.
- *Language models for spoken language, including dialogue management.*
  Goal: To create speech technology-motivated language and dialogue models for Swedish.
- *Methods for automatic speech recognition.*
  Goal: To develop state-of-the-art automatic speech recognition for Swedish.
- *Principles of speaker characterisation.*
  Goal: To develop speaker characterisation modelling methods for use in speaker verification, speech recognition with rapid speaker adaptation, and individulized speech synthesis
- *Speech production models for multi-modal speech synthesis.*
  Goal: To develop articulatorily motivated, highly natural multimodal parametric synthesis for different voices and speaking styles.

Board of CTT

The board of CTT has the following members:

- Bengt Waernulf (chairman)
- Patrik Granström,Vattenfall
- Kajsa Hofvendahl, Saab Tech Systems
- Jesper Högberg, PipeBeach
- Francisco Lacerda, Stockholm University
- Yngve Sundblad, CID/Nada, KTH
- Claes Tjäder, Hjälpmedelsinstitutet

Co-opted members are:

- Björn Granström, Director of CTT, and
- Rolf Carlson, Co-director of CTT

The funding agency VINNOVA has one observer on the board:

- Barbro Atlestam

The International Scientific Advisory Board of CTT has three members:

- Joseph Mariani (LIMSI, France)
- Yoshinori Sagisaka (ATR and Waseda Univ., Japan)
- Victor Zue (MIT, USA).