

# Signals

Signalverarbeitungssysteme bereichern unser tägliches Leben. Die Technologie dahinter bleibt hingegen oft im Verborgenen. Für die Linguwerk GmbH gehören zeitdiskrete Signale und Systeme zur Kernkompetenz:

- Verfahren der Signalanalyse und -synthese
- Signal- und Mustererkennung, Klassifikation
- Akustische Signalverarbeitung
- Sprachtechnologie
- Bildverarbeitung
- Adaptive Verfahren und kognitive Systeme
- Algorithmen-Design

Die Linguwerk GmbH ist als Technologieunternehmen kompetenter Partner, Hersteller und Dienstleister in den Bereichen Signals, Technology und Media. Ob es um klassische Technologieprodukte, Zukunftstechnologien oder um die Erarbeitung von maßgeschneiderten Lösungen geht, wir stellen uns mit Erfolg jeder Herausforderung.

Linguwerk GmbH is a competent partner, manufacturer, and service provider in the fields of signals, technology, and media. We successfully face every challenge whether it is a classic product, future technology or creating custom challenges.

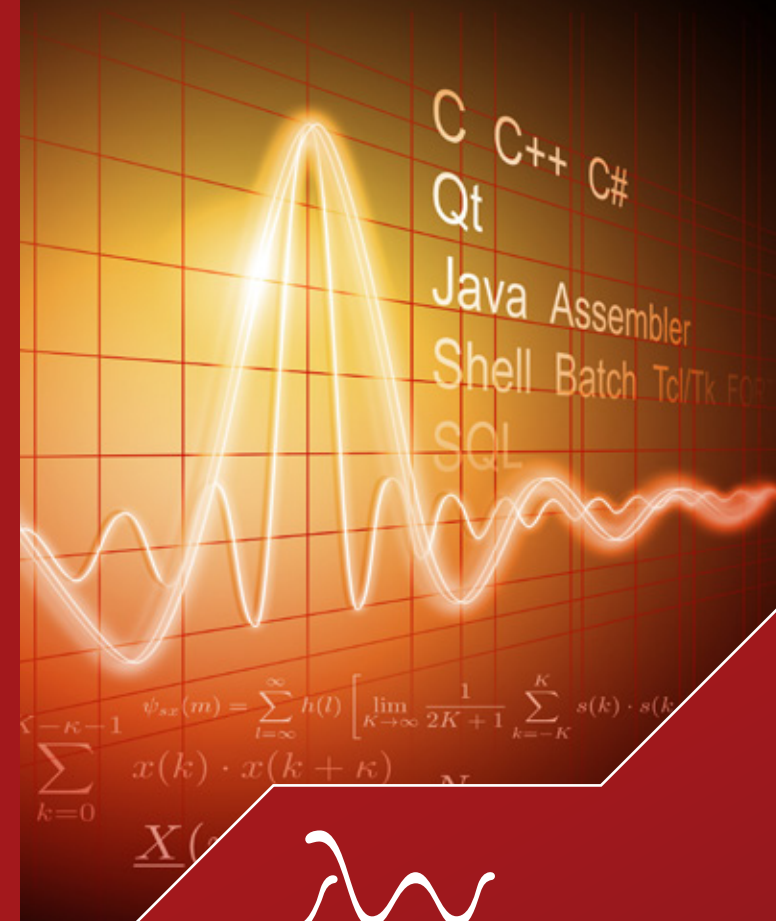
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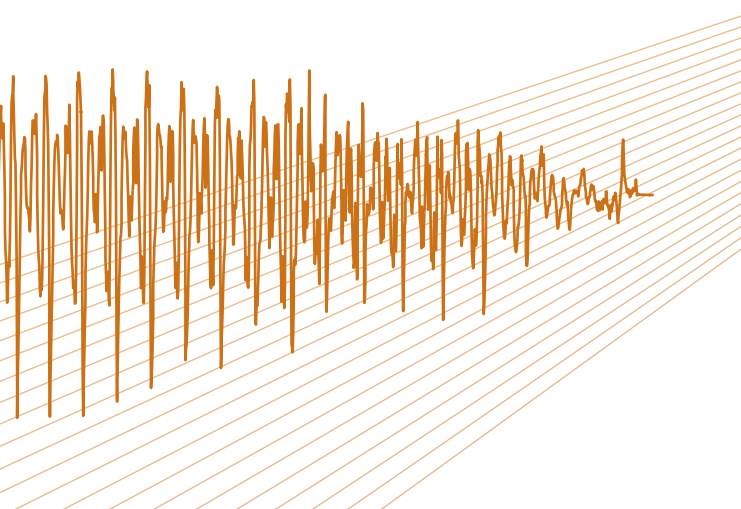


## Signals

Signal processing systems enrich our daily life. However, the technology behind these systems often remains hidden. Discrete-time signals and systems are one of our core competencies:

- Signal analysis and synthesis
- Signal and pattern recognition and classification
- Acoustic signal processing
- Speech technology
- Image processing
- Adaptive methods and cognitive systems
- Algorithm design

### SELECTED REFERENCES ►



## SPEECH TECHNOLOGY

### LINGUWERK GMBH | EMBEDDED SPEECH RECOGNITION

Development of a highly integrated speech recognition device for very limited resources. Developed in Matlab, implemented in C as DLL and as an executable file for various platforms. C, C++, Matlab, Octave, SVN, Visual Studio, MFCC, VisualDSP++, Latex, Hidden Markov Models (HMM), Dynamic Time Warping (DTW), VAD, NR, FFT, Blackfin DSP BF52x,  $\mu$ C PIC32, Raspberry Pi

### TELECOMMUNICATION PROVIDER | SPEECH RECOGNITION FOR HOTLINE

Realization of real-time ability of a speech recognizer for a hotline. Extensive restructuring of architecture for distribution of recognition among several CPUs. Examination of resource requirements for STL containers in a multithreaded environment. C++, Qt, STL

### TELECOMMUNICATION PROVIDER | EVALUATION SERVER FOR TTS

Conception and startup of an evaluation system on a Linux server which automatically carries out evaluation of a text-to-speech system from a remote computer. Shell, Tcl/Tk, Speech synthesis (TTS)

## ALGORITHMS & DIGITAL SIGNAL PROCESSING

### CONFERENCE SYSTEM MANUFACTURER | AEC – ACOUSTIC ECHO CANCELLATION

Evaluation of an acoustic echo cancellation (AEC) system under various room acoustic conditions (reverberation) and various noise conditions. Implementation of several algorithmic methods for improving the AEC performance. C, Matlab, Visual Studio

### AUTOMOBILE MANUFACTURER | OBJECT RECOGNITION SENSORS

Development of a measurement and recognition principle for an object detection and recognition sensor for automobile interaction. Development of signal processing and recognition algorithms and implementation of these on a low power microcontroller (sensor hardware). Matlab, C,  $\mu$ C Renesas uPD78F1835\_64, Raspberry Pi, Embedded Linux, signal and image processing, machine learning

### LINGUWERK GMBH | NR/NC – NOISE CANCELLATION

Development of noise reduction for speech signals for a hands free phone system. Design of an adaptive algorithm, simulation, implementation, and integration on an embedded  $\mu$ C platform (fixed point). C, Assembler, Matlab, VisualDSP++, Blackfin DSP BF52x, Visual Studio, MPLAB,  $\mu$ C PIC32