

Possible topics for MA theses in the EMCL program

Students can choose among the following topics and supervising universities of the EMCL consortium for their final thesis.

Please note that the decision where and with whom to write the thesis has to be done by the end of June in the summer term which all students spend in Potsdam, Germany. Students communicate their decision not only to their supervisors but also to the coordinating University of Potsdam, attn. Dr. Frank Burchert (burchert@ling.uni-potsdam.de).

Joensuu (supervisor: Prof. Werner)

SPEECH SYNTHESIS

- Rules for Klatt synthesis of sounds from your native language
- Rules for articulatory synthesis of sounds from your native language
- Grapheme-to-phoneme or/and other linguistic preprocessing rules for your native language
- Prosody control rules for your native language
- Compensatory synthesis for impaired speakers
- Critical review of an existing synthesis system (both theory and application)
- Psycholinguistic applications of speech synthesis

AUTOMATIC SPEECH RECOGNITION

- Building an ASR language model for your own data
- Compensatory ASR for impaired speakers
- Building a rule-based phone classifier and evaluating its performance
- Design and implementation of an HMM-based triphone recognizer
- Using ASR techniques for acoustic assessment

SPEECH CORPORA

- Design and construction of a speech database for pathological data
- Automatic analysis of data from (e.g.) the CHILDES database
- Critical review different corpus annotation formats
- Spoken versus written language corpora
- General speech corpus design considerations: fixed annotations

vs. dynamic measurements (case study with self-collected data)

ACOUSTIC ASSESSMENT OF SPEECH IMPAIRMENTS

- A version of (parts of) the Speech Examination for your native language
- Normal and/or pathological data collection and analysis
- Comparison of the Speech Examination to other evaluation protocols
- Application and critical evaluation of the Speech Examination's tasks and their scoring instructions
- Recent trends in acoustic pathology assessment
- Using ASR techniques for acoustic pathology assessment

Groningen (Supervisor: Prof. Bastiaanse)

A thesis can be written on

- (1) Aphasia
- (2) Developmental language disorders
- (3) Experimental linguistics, including neuro imaging

Ad (1) Aphasia

Only experimental studies are accepted. The experiments are usually on grammatical impairments, although lexical-semantic and phonological impairments are possible topics as well. The experiments are set up during the research class on *Crosslinguistic Aspects of Aphasiology* in the second term and are usually in the student's native language. This means that the student needs access to aphasic patients in his/her home country. Instead of an experiment, spontaneous speech analysis is possible as well, focused on linguistic disorders. Pragmatic disorders, right hemisphere language disorders, speech disorders (apraxia of speech, dysarthria) are not encouraged.

Ad (2) Developmental language disorders

Any topic on typical or atypical language development, for example, the language production of children with Down's syndrome, hearing impairment, Specific Language Impairment or an autistic spectrum syndrome are acceptable. Group studies or case studies can be carried out, as long as empirical data are involved and a linguistic analysis is carried out.

Ad (3) Experimental linguistics

A behavioral experiment over sentence comprehension (possible pre-test for use with patients) more or less of their own choice and language can be conducted. Another possibility is to become involved in an on-going project with ERPs or fMRI, but the topic will be limited by the project. Further analysis of existing data is sometimes also possible.

Potsdam (different supervisors)

Aphasiology: Similarly to the Aphasia topic in Groningen, experimental studies on grammatical impairments (usually agrammatism but also other syndromes) are accepted. The study should have a focus on cross-linguistic aspects of aphasia and are ideally conducted in the student's native language.

Morphological processing: Studies are accepted that focus on morphological processing in normal speakers by using experimental methods such as cross-modal priming or lexical decision tasks. The work can be embedded in a running PhD project on the processing of prefixed verbs at the University of Potsdam. Experimental material can be all types of morphologically complex words, ideally in the student's native language.

Supervisor: PD Dr. Burchert

Multilingual aphasia test: If you come from a country with languages for which there is as yet no aphasia test available, and especially if you come from a multilingual country, you can develop an aphasia test for that language.

Acquired/Developmental dyslexia test: same conditions as multilingual aphasia test.

Analysis of aphasic spontaneous speech: using the methods of the international project "aphasiabank"

Neuroimaging language: only for students with previous extensive experience of neuroimaging.

Supervisor: Prof. De Bleser

Language Acquisition and Developmental Language Disorders: Experimental studies on phonological, lexical, syntactical development and acquisition of information structure in normal first language acquisition as well as in different kinds of developmental language disorders (SLI, genetic disorders etc.). The participants for these studies have to be recruited by the students. Studies on early speech perception and artificial grammar learning using the experimental paradigms of the Potsdam Babylab are possible as well. In addition, analyses of children's spontaneous speech either using corpora

collected by the students or using existing corpora like the CHILDES database can be conducted – also focusing on phonology, lexicon, syntax and information structure. Studies in the student’s native language are preferred.

Supervisor: Prof. Höhle

Sentence comprehension: several research topics are available on research involving sentence comprehension. Eyetracking, ERP and self-paced reading are the usual methods used but others may also be deployed as needed. Research can be on German (if the student has good to native German) or the student's own language (provided there are native speakers accessible as participants either in the home country or in Berlin/Potsdam). If the student is an excellent programmer, several computational modeling projects are also open (all involve sentence comprehension).

Supervisor: Prof. Vasishth

Milano (different supervisors)

IMPLEMENTATION OF THE READING PROCESSES IN THE BRAIN

- Functional anatomy of reading processes
- Developmental dyslexia: cognition, physiology and anatomy

Supervisor: Prof. Eraldo Paulesu

SEMANTICS/PSYCHOLINGUISTICS

- the computation of pragmatic inferences in children and/or adults
- the resolution of syntactic and/or semantic ambiguity in processing sentences in different languages
- the emergence of default preferences in different languages

Supervisor: Dr. Francesca Foppolo

STATISTICS AND DATA ANALYSIS

Supervisor: Dr. Cristiano Vezzoni

SECOND LANGUAGE ACQUISITION

- Influence of L1 on L2: acquisition of the pro-drop parameter

SIGN LANGUAGE

- Syntax and phonology in different sign languages

Supervisor: Dr. Carlo Geraci

LANGUAGE ACQUISITION

- Language acquisition in children under six: studies on normal and abnormal populations

Supervisor: Prof. Laura D'Odorico

NEUROLINGUISTICS AND CLINICAL APHASIOLOGY

Supervisor: Dr. Janet Slotow

MENTAL REPRESENTATION OF NOUNS AND VERBS

Acquired dyslexia and dysgraphia: diagnosis and rehabilitation

Supervisor: Prof. Claudio Luzzatti
