# **Annual Report**

**LUND UNIVERSITY HUMANITIES LAB | 2016** 



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# The Director's introduction

Lund University Humanities Lab is an autonomous interdisciplinary research and training facility hosted by the Joint Faculties of Humanities and Theology (JFHT) at Lund University. It is open to scholars, teachers, and students at these faculties but also to users across Lund University and beyond. We host technology, methodological know-how, data management and archiving expertise, and a wide range of research projects. The Lab has facilities in the two buildings that host departments in the Humanities and Theology at Lund University – the Centre for Languages and Literature, and LUX.

Lab activities are centred around the Humanities with research targeting issues of communication, culture, cognition and learning, but many projects are interdisciplinary and conducted in collaboration with the Social sciences, Medicine, the Natural sciences, Engineering, and e-Science. We provide training in hosted technologies and related methods through courses and tutorials, seminar series, and guided demo sessions. We are also an arena for collaboration between academia and external stakeholders in education, industry, and cultural institutions locally, nationally, and internationally. The Lab is a dynamic environment enabling scholars across the JFHT to combine traditional and novel methods, and to interact with other disciplines.

During 2016 the Lab continued to expand its activities and engagement at all levels. We are proud to have more users than ever, new collaborations, courses, seminar series, and as always a string of visiting scholars. We have hosted workshops and meetings on everything from research data management to artistic research and virtual reality. We continue to provide training in the technologies at hand through workshops and courses open to researchers, teachers, and PhD students, as well as by organising a steady stream of demo sessions, seminars, etc.

In 2016 we were also lucky enough to receive a generous grant from the LMK Foundation to secure a complete upgrade of the digital classroom in the Lab. We are deeply grateful for this support.

This Annual Report 2016 showcases some of the Lab activities, highlighting that the Humanities Lab is as dynamic as ever – an exciting environment for scholars to tackle the scientific challenges ahead.

Marianne Gullberg
Director of the Humanities Lab



## The Dean's introduction

The Joint Faculties of Humanities and Theology are privileged to serve as hosts to Lund University Humanities Lab. A leading research and training facility, the Humanities Lab has become a key infrastructural unit at Lund University.

Ever since it officially opened in 2007, the Lab has inspired scholars in the Humanities and Theology to develop totally new approaches to challenges encountered in their research. Today, many of our disciplines rely on the Humanities Lab as an invaluable component in their research environment. Despite its name, the Lab is by no means restricted to the Humanities and Theology. Most faculties at Lund University employ scientists for whom the Humanities Lab is a vital resource. Researchers from all over the world collaborate with colleagues at and through the Lab. Lund University Humanities Lab is a vigorous interdisciplinary research unit where scholars and students come together in a uniquely exciting and highly productive research environment.

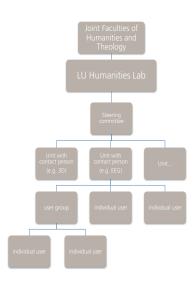


Johannes Persson

Dean of Research at the Joint Faculties of Humanities and Theology

# Organisation

Organisationally, research in the Lab is of two kinds. Most research in the Lab is conducted by scholars whose research grants and groups are located in their home departments. These scholars come to the Lab to conduct their empirical studies using Lab equipment and resources, and then return to their home departments. The Lab also hosts its own externally funded research projects, with grants and research groups located in the Lab. Examples in 2016 include EyeLearn: Using visualizations of eye movements to enhance metacognition, motivation and learning (Holmqvist; Marcus and Amalia Wallenberg Foundation); a Wallenberg Scholar grant on Embodied bilingualism (Gullberg; Knut and Alice Wallenberg Foundation); and Language as key to perceptual diversity (Burenhult; Bank of Sweden Tercentenary Foundation Jubilee Initiative).



# Leadership

#### STEERING COMMITTEE

#### Director of the Humanities Lab – Marianne Gullberg

Marianne Gullberg is professor of psycholinguistics at the Centre for Languages and Literature. Her fields of expertise include adult second language acquisition, bilingual acquisition and processing, and gesture production and comprehension in acquisition. She previously headed a research group on multilingual processing at the Max Planck Institute for Psycholinguistics with Prof. P. Indefrey, and is a co-founder of the Nijmegen Gesture Centre with Prof. A. Özyurek, the first centre of its kind. Her current research targets multimodal bilingual language processing, the earliest stages of implicit language learning, and bimodal discourse cohesion. She is the recipient of a Wallenberg Scholar Grant.



Stefan Lindgren is a research engineer in the Lab with special responsibility for technology and procurement. His particular expertise lies in 3D data, motion capture, and virtual reality. In this, he works closely with archeologists and historians, but also cognitive scientists, and linguists.

#### Educational Developer - Frida Splendido

Frida Splendido is a senior lecturer of Swedish as a foreign/second language at the Centre for Languages and Literature. Her research focuses on language acquisition, in particular phonological development in second language learners and bilingual children. In the Lab she is responsible for training, course coordination, and course development.

#### Research Representative - Susanne Schötz

Susanne Schötz is associate professor of Phonetics, and a member of the Division of Logopedics, Phoniatrics, and Audiology. Her research focuses on phonetic variation in Swedish and other languages, paralinguistic variation like age, emotion, attitude and health condition, and also phonetic variation in animal vocalisations. In the Lab she is responsible for research issues, as well as for the articulograph.

#### Administrative Coordinator – Maja Petersson

Maja Petersson is administrative coordinator in the Lab. She is responsible for monitoring action plans, policy and procedure to optimise project management in the lab. She is also responsible for communicating about the Lab internally and externally.



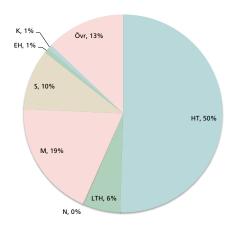








# 500 users: facts and figures

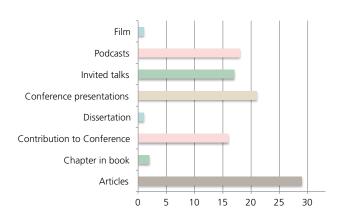


#### **500 USERS**

Figure shows % of all (just over 500) users by faculty at Lund Unviersity

HT: Joint Faculties of Humanities and Theology, LTH: Faculty of Engineering, N: Faculty of Science, M: Faculty of Medicine, S: Faculty of Social Sciences, EH: School of Economics and Managment, K: Faculty of Fine and Performing Arts, Other (i.e. other universities in Sweden or abroad, museums, etc.)





#### **RESEARCH OUTPUT**

Figure shows research output in the Lund University research portal (LUCRIS), tagged with "Humanities Lab".



#### **VISITORS**

Figure shows home countries for long-term visitors in the lab 2016 (se p 24)









Kerstin Gidlöf studies visual attention and choice in online shopping in one of the projects in the lab using eye-tracking (Gidlöf, Holmberg, Wallin).



Stefan Lindgren working in Greece with a project using drones together with other techniques to create digital elevation models of the landscape.



In a collaborations with the National Archives in Copenhagen and Kulturen in Lund, Lab members implemented a technique called reflectance transformation imaging to interpret images and inscriptions on medieval seal stamps.

## Research

**EYE-TRACKING.** In 2016 research using eye-tracking continued to flourish. Lab members were active internationally at events such as the Eye Tracking Research and Applications (ETRA) conference in Charleston, SC, USA (Nyström Tutorial chair), at the Scandinavian Workshop on Applied Eye Tracking, Turku, Finland (Holmqvist on organising committee), as invited speakers in HongKong (Holmqvist), for example. Lab members also organized the *Lund Eye Tracking Academy* (LETA) workshop twice to provide training in eye-tracking, a workshop that by now has trained more than 500 scholars worldwide.

Locally, research projects made progress in many areas. EyeLearn: Using visualizations of eye movements to enhance metacognition, motivation and learning (Holmqvist), a project dedicated to the study of students' information processing through eye-tracking, was for the first time able to present information to participants about where other participants were looking at a screen in real-time, thus enabling joint search for information on a shared display (Niehorster, Holmgvist, Cornelissen, Hooge). A project using eye-tracking to study children's attention to advertising on internet, Effects of online advertising on children's visual attention and task performance during free and goal-directed internet use (Holmberg, Sandberg, Holmqvist) came to fruition as a doctoral degree (Holmberg). A joint project with the Faculty of Engineering, the Biomedical Engineering group on signal processing, and the strategic research area e-Science (http://essenceofescience. se/) saw the completion of a doctoral project (L. Larsson, see box p 14) on event detection in eye-tracking data in dynamic stimuli (Nyström, Stridh). Nyström has also initiated a project with the Medical Faculty around a PhD project (Rosengren, Stridh, Hammar) dedicated to the study of nystagmus, a medical condition of involuntary eye movements with effects on vision. Nyström also collaborates with the University of Nottingham on a project concerning microsaccades.

External users to the Lab also initiated and conducted a range of studies using eye-tracking in 2016, for example to examine how landscape features affect visual behaviour (Sevelin, Sang, Nyström), visual attention and choice in online shopping (Gidlöf, Holmberg, Wallin), gaze patterns in eye-witness reports of crime scenes (R. Johansson, Dahl, J. Larsson), and children's developing capacity for perspective-taking and theory of mind (Psouni, A. Johansson, Nilsson, R. Johansson, Falck).

Method development is continuous in this domain, involving for example data quality checking routines, the development of new algorithms, demo platforms, etc. Importantly, an open source framework for sharing eye-tracking data in real

time was published and shared on GitHub (Nyström, Niehorster, Cornelissen, Garde).

**ELECTROPHYSIOLOGY.** Work using electrophysiological measurements of brain activity continued to expand. To meet the growing demand for training from advanced students and researchers, the Lab has developed new modules in the EEG course, as well as practical tutorials on capping, for example (Andersson, Garde).

Research projects exploiting the technology include a Wallenberg Academy Fellow (Roll) whose project traces the brain networks that support interaction between language melody (intonation) and grammar in language processing (Roll, Novén, Söderström, Horne). Other projects using this technique explored how Swedish speakers process quantifiers (Klingvall, Heinat), how negation is processed in English (Farshchi, Paradis, Andersson), and how learners of Italian process grammatical gender (Gargiulo).

**3D SCANNING, VIRTUAL REALITY (VR).** The use of 3D and VR techniques continued to grow especially in the domain of archaeology and cultural heritage, and often in international collaborative teams. For example, Lab members were responsible for the 3D documentation of 2,500-year-old mass graves found in Faliron, Greece, under challenging solutions in collaboration with the Swedish Institute in Athens. The graves were 3D-scanned and photographed, post-processed, and presented online (Larsson, Lindgren, Lundström). Two projects in Lebanon have pushed developments further for creating digital elevation models of the landscape by combining techniques such as photos from drones, imagebased modelling, and GIS data (Lindgren, Landeschi). Similarly, in Hermione in southern Greece a high-resolution digital elevation model of the entire city was created, in which 3D models of the visible ancient remains could be placed to provide a clearer picture of what the ancient city might have looked like (Lindgren, Landeschi, Gerding).

Other projects include collaborations with the *National Archives* in Copenhagen and *Kulturen* in Lund, in which Lab

members (Garde, Larsson, Lindgren) implemented a technique called reflectance transformation imaging to interpret images and inscriptions on medieval seal stamps. Another project conducted 3D scans of the Republican Forum Romanum in Rome (Gerding, Dell'unto, Lindgren).

A lot of work also targets the implementation of VR into immersive environments and devices (e.g., VR-glasses, cardboard 3D-viewers holding smart phones with 3D-apps), as seen in the gaming industry and in human-machine interaction research. For example, an updated version of the models of Pompeii previously produced by Lab members has been adapted to the latest version of VR glasses (Garde, Lindgren). This enables a visitor to experience both the scanned models depicting the ruins in today's Pompeii and the reconstructed models of its appearance 2,000 years ago. A VR framework for compiling research 3D data into an interactive VR-application (Garde, Lindgren) is also under way.

Another area of expansion is artistic research. In November Lab members participated in a symposium dedicated to the use of VR techniques at the intersection between research and art. Virtual Reality/Artistic Research A Maker Symposium was organised and hosted by the Inter Arts Center, LU (http://www.iac.lu.se), and the School of Arts and Communication (K3), Malmö University, in collaboration with the Humanities Lab (Garde, Gullberg, Larsson, Lindgren), and artists working with VR: Bombina Bombast (SE), Makropol (DK), and Gibson/Martelli (UK). The aim was to explore the possibilities of VR technology for artists and researchers and how it may contribute to new formats and ideas around the artistic work with audience, participants, history, and spaces.

MOTION CAPTURE AND ARTICULOGRAPHY. The Lab hosts two sets of technology that allow scholars to record human bodily movements in 3D with high spatial and temporal resolution: motion capture and articulography. The motion capture system consists of eight high-speed infrared cameras linked to each other, a high-speed video camera and a recording computer. The infrared cameras detect and record the 3D position of reflective markers strategically located on

the moving individual's body. In articulography measurements are obtained by recording the locations of small sensor coils that are attached to the articulators, such as the tongue, in an electromagnetic field.

The use of motion capture increases steadily. A range of projects now use motion capture in the context of virtual reality to examine speakers and their gestures, for example. The Linnaeus Centre Thinking in Time: Cognition, communication and learning used motion capture to build virtual language users to explore gesture-speech integration (Nirme, Gulz, Haake, Gullberg). In particular, in one project virtual agents were built based on mocap recordings of real speakers and then experimentally manipulated (Nirme). Gullberg's Wallenberg Scholar project Embodied bilingualism exploits the same techniques to build and examine speech-gesture profiles of native and non-native speakers of Swedish, French and English, in order to probe issues of bimodal language processing in mono- and bilingual speakers. A very different type of project has used motion capture of sound emitting devices to create visualisations of sound (Aström).

Here too much work was devoted to method development, especially to improve and asses data quality, like computational camera placement (Nirme, Garde) and event detection (Garde, Abiri, Bobrick). Both of these projects have been conducted in the context of an Advanced Study Group entitled *INTEGRATE* at the Pufendorf Institute for Advanced Studies (http://www.pi.lu. se/) at LU (see Other areas), bringing together scholars from the Engineering faculty with Lab expertise.

The articulograph was used in phonetic projects in the Linnaeus centre *Thinking in time: Cognition, communication, and learning CCL* and in individual research projects such as a PhD project in linguistics examining tonal, facial and articulatory gestures in Swedish prosody (Svensson Lundmark). The Lab also developed training in articulography for students of logopedics and speech therapy (Schötz, Frid).

**SOUND AND FILM FACILITIES.** Activities in the LARM-studio, the state of the art facility for professional level audio and video recordings, continued to develop in 2016. The

studio hosted podcasts, such as the podcasts of the Joint Faculties of Humanities and Theology, and *Filosofipodden*. It was also used for academic courses in music production, and to produce educational material for so-called flipped classrooms (Kvissberg).

In addition to these activities, the studio and its expertise (Roslund) was involved in a number of research projects. Speakers talking to each other in the Scanian dialect were audio- and video recorded for a project looking at natural conversation in different languages and dialects (Valtersson). Stimuli were video recorded for a project looking at how infants and apes may link changes in movements and tones (Gärdenfors et al.). Another project examined how facial expressions and manual gestures combine to create different meanings (Sandler, Gullberg). A novel project was also initiated to document how reading literature aloud in groups might help alleviate chronic pain in patients (Ohlsson, Forslid). Student projects included the recording of panel debates in front of an audience (Sayin, Hill), and interviews concerning how emojis are used in texts (V. Johansson, K. Gullberg).

A big project entitled *Melody in human-cat communica-tion – Meowsic* (Schötz), funded by the Marcus and Amalia Wallenberg Foundation, examines the phonetic properties and possible interdependence of human and feline vocalisation. The project draws on studio expertise to test portable video and audio recording equipment to record cat vocalisations in human-cat interaction. The project has attracted a lot of attention (see Visibility, access, outreach and box p 12).

The anechoic chamber was used in studies on vocal communication and voice treatment (the Linnaeus Centre CCL), and in auditory research stimuli and materials, such as in a project studying rhythm in monolingual and bilingual speech (Tronnier).

#### CORPUS SERVER, SWE-CLARIN, DATA MANAGEMENT.

The corpus server offers secure, long-term storage of structured digital research data. The aim is not only to archive data sets and corpora, but also to help create a locus for dynamic data management. As such the corpus server can function as a collaborative workspace, where a group of researchers can

download, edit and enrich, and upload data and metadata. Metadata are publicly visible, browsable and searchable through the corpus browser, while the data themselves are password-protected. With this setup, other researchers can read about data that may be of significance for them and then contact the responsible researchers and ask for permission to access these data (https://corpora.humlab.lu.se).

In 2016, the corpus server comprised 3.5 TB data (an increase from 2015 of 1 TB), and new data ingested included the *Barack Obama Corpus* (Riesner, se box p 22) ), which consists of all speeches in text form given by Barack Obama between 2009 and 2016 taken from the White House Archives; data from the ERC project *Language, Cognition, and Landscape* (Burenhult) which provides data from endangered languages; a small corpus of the endangered languages Kalamang and Uruangnirin (Visser); and a new version of the so-called *Richthoff Child Speech Corpus* (Strömqvist, Richthoff).

In 2016 the project Language as key to perceptual diversity (Burenhult) was launched, funded by the Bank of Sweden Tercentenary Foundation Jubilee Initiative New horizons in the humanities and social sciences. The project explores the linguistic representation of the senses across diverse and endangered speech communities in collaboration with cognitive psychology, geography and history of Religions. The program, which involves collaborations with Newcastle, Radboud University, Southern Denmark, and Zurich, started with fieldwork in Malaysia and Ghana. The project piloted the use of action cameras with built-in GPS in documenting motion categories and in combining recorded language data with geographical coordinates. Project output is integrated into the corpus server.

The Humanities Lab is a node in the Swedish national consortium for language technology, Swe-Clarin (http://sweclarin.se). Throughout the year, the local coordinator (Frid) and/or the Lab Director (Gullberg) attended four virtual meetings, and two consortial meetings in Stockholm and Gothenburg. The research activities included initiation of pilot projects and participation in on-going research projects under the guidance of the local coordinator (Frid). For example, one project was concerned with how to calculate a lexical competition score (Söderström, Roll, Horne). Lab members (Frid) developed a database with word initial fragments and syllables extracted from a large pronunciation dictionary (the Swedish *NST* lexicon) in order to weight these with word frequencies from the Swedish PAROLE corpus listing whole words. The resulting dictionary was used in a neurolinguistic study of early word activation in online language processing (Söderström et al., 2016). A second project investigated how different people (patients, family carers, healthcare professionals) use metaphors in end-of-life care (Gustafsson, Hommerberg) in a corpus consisting of interviews and contributions to online



One of the projects in the motion capture studio has used motion capture of sound emitting devices to create visualisations of sound (Åström). Picture shows a test with a small drone.



The LARM-studio has been involved in a number of research projects as well as courses in music and film production, and has also hosted a number of podcasts.



As a member of SWE-CLARIN, the Humanities Lab will provide tools and expertise related to language archiving, corpus and (meta)data management, with a continued emphasis on multimodal corpora, many of which contain Swedish resources, but also other (often endangered) languages, multilingual or learner corpora.

# A grant from MAW starts in the lab

The MAW grant *Melody in human–cat communication* (Meowsic), a five-year project directed by Susanne Schötz, and funded by the Marcus and Amalia Wallenberg Foundation, was initiated in July 2016. The project studies the communication between humans and domestic cats, specifically how the prosody, including the voice, melody (intonation) and speaking style – in human speech and in cat vocalisations – influence the vocal interspecies communication.

The project primarily concerns basic research and represents pioneering work within human—cat communication. The results may lead to an improved quality of life for cats and potentially for other pets as well. Understanding the vocal strategies used by humans and cats in human—cat communication will have profound implications for our understanding of how we communicate with our pets in general, and has the potential to improve the relation between animals and humans within several fields, including animal therapy, veterinary medicine, and animal sheltering.

fora. Drawing on tools developed in Lancaster, Frid developed a Swedish version for automatic semantic tagging of texts and automatic detection of metaphors. Another project investigated how pitch accent in speech and head and eye-brow movements jointly highlight information (Ambrazaitis, House). Frid developed a tool for automatically detecting and tagging head movements in video data. A fourth project, funded by the strategic research area for e-Science, eSSENCE, focuses on information extraction from scientific articles in the area of epidemiology (Björk). Frid used methods from so-called natural language processing (NLP) to automatically extract epidemiological facts such as aim, patients, statistical method, and effect size of the result from collections of papers. All tools developed are available via the Humanities Lab.

Lab members were generally active in other areas concerned with data management and data treatment. The Lab implemented safer routines and handling of Lab users' datasets (Lindgren, Holmberg). Members also worked on a growing library of 'starter kits' with programming scripts and guides on how to conduct and post-process lab experiments (Andersson, Garde). The tools developed within Swe-CLARIN contribute to this growing library. The Lab was also deeply involved in national and local discussions concerning data management more generally, and attended an open forum day on research data organised by the Swedish National Data Service in Gothenburg, and local seminars on open research data, ethical and legal aspects on research data (J. Larsson). Gullberg participated as a member in a Committee for research data, appointed by Lund University Research Board.

**OTHER AREAS.** The Lab was very active as a partner in the strategic research area e-Science in 2016.

Importantly, the Lab was part of an Advanced Study Group (ASG) at the Pufendorf Institute for Advances Studies at LU entitled *INTEGRATE: Empowering scientific discovery using computers* (Davies coordinator; Gullberg in the steering committee). INTEGRATE grew out of Lab collaborations in e-Science, and brought together scholars from four faculties (Humanities and Theology, Engineering, Medicine, and Natural Science, with the addition of the University Library). Over two semesters scholars met to share expertise, advance research at the boundaries of research areas, and to identify the training needs of the next generation of researchers in numerical techniques. Lab members participated in two workshops with talks (Gullberg) and in four so-called hack days (Garde, Nirme, Nyström,

R. Andersson). During the hack days practical problems were jointly tackled such as how to simulate optimal camera positioning in motion capture, or how to calculate safety levels of infrared radiation to the eye. The successful collaboration has led to a further grant application for a collaborative Theme at the Pufendorf Institute in 2017-2018.

Through a new affiliation (Åhlfeldt), the Lab has also become engaged in a growing area of study creating digital platforms for so-called 2D time and space based data visualisation (see further National and international collaborations). The technique, mainly applied to culturage heritage data, allows different data types to be linked (e.g. manuscripts, visual representations of artefacts, metadata, and GIS data) in SQL databases visualised in online interfaces. In the project *Formative Wisdom* (Rubenson) early monastic sayings in medieval European manuscripts (ca. 800-1500) can be registered with metadata on a digital platform that also includes a variety of tools for detailed analysis (https://monastica. ht.lu.se). The project *The Key to Uppåkra* (Ahlström, Roslund) creates an integrated SQL database and a mapping application containing spatial (GIS) and temporal information from the archaeological investigations at Uppåkra in Scania. The Digital Atlas of the Roman Empire (DARE; Åhlfeldt, Pelagios Commons), hosted by the Department of Archaeology and Classical History, aims at building a detailed geographical index (a gazetteer) and a tiled base map of the Ancient World, integrating other gazetteers, satellite imagery, national topographic maps, source texts, scholarly literature, etc (https://dare.ht.lu.se).

Work on multimodal analysis of human behaviour (speech and gesture) continued to thrive. These studies exploit audio-video analysis and coding in the video annotation software ELAN, but also experimental tasks generating reaction times, and motion capture to create virtual agents. A set of projects examined how cohesion in discourse is maintained through both speech and gesture, in one case comparing instruction giving in Dutch and Italian (Campisi, Gullberg), in another Swedish and Italian narratives (Graziano). Graziano received new funding from the Crafoord foundation to examine Cross-linguistic and developmental perspectives on the expression of pragmatic meanings in Italian and Swedish. A PhD project also targeted gestural cohesion in German discourse including reactions to gestural inconsistency (Debreslioska, Gullberg). Two other PhD projects en route under Gullberg's guidance, partly as part of the Wallenberg Scholar grant, also targeted speech and gesture exploring multimodal conceptual metaphors in Turkish and Swedish (Christensen),

### Research Grants and Awards

#### ANNIKA ANDERSSON, AGNETA GULZ

May 24, 2016

Cognition, Communication and Learning research grant, The Linné Centre

#### MARIA GRAZIANO, MARIANNE GULL-BERG, EMANUELA CAMPISI

May 30, 2016

Research grant from Crafoordska Stiftelsen

## ANNA W GUSTAFSSON, JOHAN FRID,

May 30, 2016

Research grant from Crafoordska Stiftelsen

BIRGITTA SAHLÉN, ANNIKA AN-DERSSON, KETTY HOLMSTRÖM, OLOF SANDGREN, KRISTINA HANS-SON, VIVEKA LYBERG-ÅHLANDER

November 29, 2016

The Swedish Institute for Educational Research

and the integration process of speech and gesture information and its effect on memory (Nirme). A new international collaboration with Israel examines how facial expressions and manual gestures combine to create different meanings (Sandler, Gullberg). Lab members also taught (Graziano) and lectured (Graziano, Gullberg) on multimodality internationally.

Other work examined the writing process. The project *Keystroke logging and peer observation – new tools for childrens' text writing* (V. Johansson, Sahlén, van de Weijer, Grenner, Åkerlund, Asker-Árnason), funded by the Marcus och Amalia

Wallenberg Foundation, aimed to implement and evaluate a model for training writing skills for school children with and without typical linguistic development using keystroke logging as one of the techniques.

## User projects

#### Laughing face with tears of joy

A study of the production and interpretation of emojis among Swedish university students,

Emojis – those graphic images representing emotions, animals, foods etc. – are an increasingly popular addition to written communication in smartphones, text messages and chat conversations. A new BA-thesis in linguistics by Kajsa Gullberg uses focus groups, recorded in the Humanities Lab's LARM-studio to explore how university students view the interpretation and usage of emojis. The main findings show that emojis are used as a divider between clauses, that they compensate for the lack of non-verbal cues in written communication, and that they are efficient emotional enhancers. They are primarily used in "hybrids" of spoken and written language, and can help managing the conversation climate, and prevent misunderstandings.

Kajsa Gullberg.

BA Thesis, Linguistics

# Looking into the black box of students' (not) handling feedback on mistakes

Informative feedback that scaffolds students to improve on a task they did not fully succeed on can be useful, but only if the feedback is (i) noticed, (ii) processed, (iii) understood, and (iv) acted upon.

In a study with 46 participants of age 11-12 we examined the entire process from noticing such feedback, processing it (in our case reading it), understanding and acting upon it, and finally making progress.

A combination of data-logging, eye-tracking, and questionnaire data was used, with the major part of the study taking place at ordinary lessons at the students' school. Three different framing conditions for the feedback were used: signalling via an animated arrow, signalling via a pedagogical agent, and a control condition with no signalling. The pedagogical agent condition, when compared to the other conditions, led to a significantly higher rate of noticing and reading feedback.

Betty Tärning, Joy Lee, Magnus Haake, Richard Andersson, Agneta Gulz

Lund University Cognitive Science (LUCS) www.lucs.lu.se/etg/

# Training, teaching, consultations

Training, teaching, and internal and external consultations are an important part of the Lab activities. Topics include how to use motion capture and 3D scanning in archaeology, how to cap participants in an EEG study, how to annotate video data, and how to programme your own experiment. This work is motivated by the goal to facilitate and enable interdisciplinary, intra- and inter faculty research, and increase access to the technological resources that require advanced methodological skills.

Courses in research methodology and data collection, taught by Lab members, are offered to PhD students and researchers (6 in 2016). These courses evolve to include new software or programming tasks as the fields move forward. Lab members are also involved in supervision at all levels (BA, MA, PhD) as a direct result of these courses and specific expertise. The Lab group tutorials were further elaborated and coordinated in 2016 by the educational developer (Splendido) to meet the demands of new users asking for specific elements (8 in 2016). Lund Eye Tracking Academy also offered two intensive workshops on eye tracking with many international participants in 2016. Lab members also give lectures on a range of topics as part of other

regular courses offered at the Joint Faculties of Humanities and Theology such as in Virtual Archeology, Linguistics, etc.

The Lab facilities are also recruited for laborative modules and training in regular academic programmes, such as the LARM studio for music production or a performing arts class (Willim), the anechoic chamber and articulography for phonetics, and the 3D unit for Virtual Reality in Archaeology.

The consultation work is also extensive (49 recorded occasions in 2016). Methodological and statistical guidance for research projects within and outside the Lab continues to grow (e.g. at the Swedish University of Agricultural Sciences, van de Weijer). The Lab programmer (Garde), the in-house methodologist (van de Weijer), and the Swe-CLARIN coordinator (Frid) all contributed to meet the increasing needs for sophisticated support. Other Lab members were recruited for external training, such as of preschool and kindergarten staff (Andersson), or interdisciplinary training events (Andersson at NanoLund).

## National and international collaborations

Lund University Humanities Lab and its members have thriving local, national, and international collaborations and networks. Those linked to individual scholars are too numerous to list here, but the Lab also has many institutional collaborations.

**LOCAL.** The Lab has many local collaborations across Lund University. Some are longstanding such as with the Linnaeus Centre *Thinking in Time: Cognition, Communication, and Learning*, the departments of Linguistics, Archeology, etc.

Newer collaborations include joint work with the Division of Logopedics, Phoniatrics, and Audiology, at the Department of Clinical Sciences (Schötz, Splendido) to build academic courses on Methods for studying speech production, phonetic transcription of (Swedish) speech. The collaboration has resulted in screen casts of short lectures on the Lab website (http://www.humlab.lu.se/en/education/tutorials/taltranskriptionin-swedish/) which are now open to everyone. Another new collaboration was initiated with the Department of Biology

to develop 3D techniques further (C. Larsson, Lindgren). New ventures also include the Inter Arts Center in Malmö, where joint work focuses on VR technology (C. Larsson, Lindgren, Garde, Gullberg).

**NATIONAL** collaborations are numerous. The Lab is a node in the national consortium SWE-CLARIN (http://sweclarin. se/), itself part of CLARIN, the European Common Language Resources and Technology Infrastructure (http://clarin.eu/). SWE-CLARIN links nine Swedish institutions around issues of language technology, including the Swedish National Data Service (SND). As a national node, the Lab provides tools and expertise related to language archiving, corpus and (meta-) data management, with a continued emphasis on multimodal corpora, many of which contain Swedish resources, but also other (often endangered) languages, multilingual or learner corpora. We also provide assistance with sensor-based methods, and speech and language technology. The local coordinator (Frid) was involved in a range of pilot projects in 2016 (see Research). The Humanities Lab also continued its collaboration with The Language Archive at the Max Planck Institute for Psycholinguistics. The Humanities Lab corpus server is linked to this archive and hosts a collection of fully documented and freely available multimodal language data, part of a much wider network of similar resources, including for example the endangered Language Documentation Programme (http://www.eldp.net/) at the School of African and Oriental Studies (SOAS), University London, and the University of Cologne (Himmelmann, Hellwig).

The Lab also continued its partnership with eSSENCE, a national strategic research program in e-Science (http://essenceofescience.se/) involving the universities of Uppsala, Lund, and Umeå. The overall enterprise focuses on the development of tools for handling, storing and retrieving research data in digital form. A joint PhD project with the Engineering Faculty on event detection in eye movement data (L. Larsson, Nyström, Stridh) was completed in 2016, and new PhD projects started. Also, data flows, large databases, heavy data computation, and data visualisation, achieved with the assistance of LUNARC, the Lund

University Center for Scientific and Technical Computing (Gullberg member of the executive board), was further exploited in a new eSSENCE-funded project in Archeology to generate 3D models online and in the field to support archeological excavation and documentation (dell'Unto, Campanaro, Landeschi, Lindgren, C. Larsson). These needs continue to grow due to the increased use of the corpus server as well as by the increased volume of sensor data. The Lab participated in the Swedish e-Science Academy meeting 2016 in Lund with a presentation on Documenting Human Diversity for the Future: Digital Resources for Endangered Intangible Heritage (Burenhult). The local collaborations in the domain of e-Science intensified substantially in 2016 through the Lab participation in the Advanced Study Group INTEGRATE at the Pufendorf Institute for Advanced Studies (see Research).

The Lab is also linked to *HUMlab Umeå* and work within Digital Humanities, a burgeoning field where the Lab also has links to the newly established *Centre for Digital Humanities* in Gothenburg. The Lab seminar series *Digital tools in the Humanities*, in collaboration with scholars from the Joint Faculties for Humanities and Theology (Gullberg, Göransson, Leander-Touati, Rubensson), further boosts these connections. In 2016 the entire HUMlab Umeå visited Lund during a two-day workshop in order to explore new contact surfaces where the two sister labs could gain impetus through collaboration. A fruitful area is the linking of linguistic or cultural heritage data to geographical data (known as time and space-related data), an area where both universities have developed expertise (Åhlfeldt, Rubensson, Roslund, Ahlström in Lund; Cocq, Foka, Edlund in Umeå).

The Lab also works nationally with stakeholders in the cultural heritage domain. Several collaborations with Swedish museums have been initiated. For example, Lab members work with *Österlens museum* in Simrishamn to develop a 3D movie for an exhibition *BronzeTech* (students, C. Larsson, Lindgren). Partnerships at various levels have also been developed with *Ystad Museum* and *Jönköping Museum*.

**INTERNATIONAL.** The Lab also has several international longstanding collaborations. Through its members, the Lab is involved in international networks related to eye-tracking. For example, Lab members hosted an international colloquium in 2016 dedicated to large scale eye-tracking setups in the fields of education, cognitive science, to explore how eye-tracking ultimately can play a role in educational practice (Holmqvist, Niehorster). Members are also represented in the *Eye Movement Researchers' Association* (EMRA) and *Communication through Gaze based Interaction* (COGAIN) (Mulvey).

Similarly, in the field of 3D scanning, the Lab has several international collaborations through its members (Lindgren, C. Larsson). These networks include the *Centre for Textile Research in Copenhagen*, Denmark, the *Swedish Institute in Athens*, and the *University of Verona*, Italy. 3D visualisation is becoming increasingly interesting also for tourism. Several partnerships develop as a function of this, for example in Mottola, in southern Italy (Lindgren, Campanaro).

The Humanities Lab is also a partner in a number of international centres such as the *Centre for Multilingualism in Society across the Lifespan*, Oslo; *Advanced Studies on Language complexity*, Lyon, France; and *DigHumlab* Denmark, a national consortium for digital humanities. The Lab hosted a workshop in Lund in 2016 with the Multiling Centre in Oslo to discuss the construction of multi-user lab facilities. The Lab also acted as the only Scandinavian partner in the network *PIRE: Understanding the bilingual mind and brain*, funded by the NSF in the USA under the direction of Prof. J. Kroll, Pennsylvania State University. The network included nine universities worldwide and focused on training and exchange. In 2016, the Lab hosted two American visiting junior scholars (Albin, Bice).

The Lab is also engaged in the network *Universitas 21*, which links 21 renowned institutions across the globe. Lab members (Gullberg) participated in a U21 meeting in Edinburgh in 2016 dedicated to the issue of language studies across the world.

The Humanities Lab continues to host many visiting scholars from all over the world for both short- and long-term stays (see Visitors). These visiting scholars contribute to the environment by generously giving guest lectures and engaging in scholarly exchange with the whole environment.

Finally, Lab members also regularly give invited scholarly talks about their own research both within and outside Lund University (see Invited talks and guest lectures). These activities contribute in important ways to building new connections.



Visiting staff from HUMlab Umeå in the digital Classroom



In a cooperation with Center for textile research, Copenhagen University, motion capture is used in exprimental archaeology to enable the study of different crafts



The Lab hosted a workshop on data managment with SOAS, University of London.

#### **SEMINARS**

The lab organises the regular Eye-tracking seminar. In 2016, there were 13 seminars on various topics with invited guests as well as internal working meetings.

The lab also participated in seminars on the topic of open access to research data, organised by the Faculties for Humanities and Theology and the Faculty of Social Sciences.



# Visibility, access, outreach

The Humanities Lab organises a wide range of events and demos, often with concrete demonstrations of ongoing research and hands-on elements (49 tours and lab demos in 2016 for local, national, and international visitors). In 2016 we hosted visitors such as Azita Raji, US Ambassador, and Eisenhower Fellowship scholar Maison Ailstock, COO at Research Triangel Park, North Carolina, and, of course, many officials and scholars from universities all over the world (see Lab demos).

We continue to offer introductory tours and demo sessions to undergraduate and postgraduate programs, and new employees at Lund University. We also encourage teachers and supervisors to participate on these occasions. The group tutorial called *Introduction to the Humanities Lab* (Splendido et al.), which allows novices to try out a number of things in the Lab, has quickly become very popular. We also organised and participated in three workshops on Infrastructures and infrastructural support for the Humanities, on issues of e-science, data management, and related topics.

The Lab further organises seminars on methodology (e.g., eye-tracking, statistics), and on Digital tools in the Humanities,

that are open to all. The Digital Tools seminar, co-organised by the Lab and scholars from the Joint Faculties (Gullberg, Göransson, Leander-Touati, Rubensson), draws a wider audience, especially as it has begun to interface with the nascent field of Digital Humanities.

As stated above, the Lab researchers also give a number of invited talks in both academic and popular science contexts, many of which showcase Lab activities and technologies. For example, the Humanities Lab participated in local outreach events such as the popular Humanities Days (*HT-dagarna*) organised by the Joint Faculties of Humanities and Theology. Lab members gave popular talks and also demonstrations of technology to the public. Some talks were broadcast by the Swedish public-service corporation, Swedish Educational Broadcasting Company and made available on their website (http:// UR.se; Andersson, Gullberg; Schötz). The Lab demonstration film developed by members (Roslund, Garde), and short video clips and slideshows all contribute to the dissemination of Lab activities in public and popular settings.

The outreach activities also included popular media. Members were interviewed in *Språktidningen* (Schötz, van de Weijer), a specialist magazine about language, and in *Dagens Nyheter* (Gullberg), a national newspaper. Members also appeared on Swedish national television on *Kunskapskanalen* (the Knowledge channel), talking about language learning and brains, multilingualism and language disorders (Andersson, Gullberg, Holmström), and about cat vocalisations (Schötz). Members also appeared on *Vetenskapens Värld* (the science programme at national television), to talk about language learning (Gullberg), and in an episode about the archeological site at Uppåkra, several of the sequences were created or filmed by Lab members (Garde, Larsson, Lindgren). Members also appeared on national

Swedish and Norwegian radio to discuss language learning and gestures (Gullberg). The project on human-feline vocalisation also attracted international attention and the PI (Schötz) was interviewed in several newspapers, magazines, radio and TV programmes, blogs and websites around the world (e.g., *The Times, der Spiegel, National Geographic, Newsweek, BBC Radio* 5, etc.).

Finally, the Lab continued to communicate via its web site and social media. The web site is continuously updated. Information about policies, user agreements, how to participate in experiments, etc., is available there. News coverage and social media activities (Facebook, Twitter) are also updated regularly.

## Media

January 13, 2017 Dagens Nyheter *"Är vissa språk lättare än andra att kombinera?"* Marianne Gullberg

February 7, 2016 Norsk Radio: Språkteigen "Store og små gester" Marianne Gullberg

February 14, 2016 Norsk Radio: Språkteigen "Ydmyke verb" Marianne Gullberg

April 4, 2016 Sveriges Television: Vetenskapens värld "Så lär du dig språk bäst" Marianne Gullberg

April 8, 2016

Sveriges Television: Utbildningsradion

"Kan du ställa en avocado? När det uppstår en konflikt mellan språket och vad hjärnan tycker"

Annika Andersson, Marianne Gullberg

May 2, 2016 Sveriges Radio: Morgon i P4 Malmöhus "Gör gester att vi förstår bättre?" Marianne Gullberg

August 25, 2016

Sveriges Television: Utbildningsradion

"Hur påverkas ordinlärning av språkstörning och flerspråkighet?"

Annika Andersson, Ketty Holmström

October 10, 2016

Sveriges Television: Vetenskapens värld

"Kulthuset i Uppåkra"

Stefan Lindgren, Carolina Larsson, Henrik Garde

December 20, 2016

"Melody in human (?) cat communication"

Articles about our research project in several newspapers, magazines, radio & TV programs, blogs and websites around the world in e.g. SVT (e.g Gokväll, Katt & Co), BBC Radio 5 live (UK), Der Spiegel (Germany), Språket, [Daily Mail (UK)], [The Telegraph (UK)], [The Science Explorer], [Le Matin (Switzerland)], [Medicite (France)], [La Vanguardia (Spain)], [Science Alert

(Australia)], [Phys.org], [El Mercurio (Chile)], [The Conscious Cat (USA)], [OddityCentral], [Language Log], [The Independent (UK)], [Photenhieb (Germany)], [Neatorama: Lifestyles of the Cute and Cuddly], [The Best Cat Page], [Petcha], [Newsweek], [National Geographics], [Metro], [The Times (UK)], [Daily Mail (UK) again], [The Guardian (UK)], [The Independent (UK) again], [The Guardian (UK) again], [Life with cats], [Stuff (New Zeeland)],

[Pickle (Australia)], [The Debrief (UK)], [Midnight in the Desert (USA)], [Petcha (again)], [Berlingske (Denmark)], [Galileo (Germany)], [Celepedia (Germany)], [Cat-news (Germany)], [Muy interesante (Spain)], [RT (Spanish)], [Sputnik Mundo (Spanish)], [Fofuras felinas (Spanish)]
Susanne Schötz, Joost van de Weijer

## Lab demos

#### **INTERNATIONAL AUDIENCE:**

Pennsylvania State University, USA

University of Turin, Italy

US Ambassador, and entourage

Braunschweig University, Germany

Center for Multilingualism in Society across the Lifespan, Oslo

University, Norway

Centro de Investigaciones y Estudios Superiores en Antropo-

logía Social, Mexico

Copenhagen University, Denmark

DigHumLab, Denmark McGill University, Canada

Centre of Languages and Literature

Helsinki University, Finland Eisenhower Fellowship scholar

National Louis University, Chicago, USA

University of Oxford, Great Britain

Speech and Language Pathology, New York University, USA

University of Oregon, USA University of Oulu, Finland University of Southern Denmark

Zadar University, Croatia

#### **NATIONAL AUDIENCE:**

Administration of the Faculties of Humanities and Theology,

**Lund University** 

Malmö Theathre Academy

Centre for Mathematical Sciences, Lund University

Department of Archaeology and Ancient History, Lund Uni-

versity Arkdis

Baseline Music studio

Qualisys

Faculty of Science, Lund University Department of Biology, Lund University

Inter Arts Center, Lund University

Karolinska Institutet Lund University 350-club

Film and Media History, Lund University

Department of Astronomy and Theoretical Physics, Lund Uni-

versity

NanoLund, Lund University

Politikerforum, Lund

School of architecture, Lund University

Swedish Language Consultancy Programme, Lund University

Master of Arts in Language and Linguistics, Lund University

Spyken, Lund

Trelleborgs Museum, Trelleborg

Umeå University

# Organisation of conferences, workshops and symposia

March 14, 2016

Eye Tracking Research and Applications (ETRA)
Charleston, South Carolina, USA
Marcus Nyström

May 26-27, 2016

November 7, 2016

# Workshop on data management and archiving – a recalibration for the next five years

Lund University Humanities Lab Marianne Gullberg, Jens Larsson, Nils Holmberg, Johan Frid, Niclas Burenhult, Nicole Kruspe, Mandana Seyfeddinipur

June 19 - 21, 2016

SWAET (Scandinavian Workshop on Applied Eye Tracking)

Turku, Finland

Kenneth Holmqvist, Diederick C. Niehorster,

Virtual Reality/Artistic Research – a Maker Symposium Inter Arts Center, Malmö Stefan Lindgren, Carolina Larsson, Henrik Garde, Marianne Gullberg







## User projects

#### The Barack Obama Corpus

The Barack Obama Corpus (BOC) is hosted at the Lab's corpus server and consists of 6 million words from nearly 3500 different texts. The texts comprise all speeches held by Barack Obama in his official capacity as 44th President of the United States of America. The files have been tagged for genre, audience type, date and location of delivery, and principal topics.

The corpora has been used in studies of how speakers build and exploit identity for communicative goals. For instance, a careful examination has revealed that President Obama repeatedly constructs the identities of 'father' and 'teacher' to persuade his audience.

#### Riesner, Katherina

Centre for Languages and Literature
The Barack Obama Corpus [Data set]. http://hdl.handle.net/10050/00-0000-0000-0003-C53B-4@view

#### Eye-tracker signals

Last year (2016) saw the continued development and assessment of methods for event detection in eye-tracker signals. To get an overview of the performance of the current state-of-the-art, an extensive evaluation of the most commonly used event detection algorithms were performed (Andersson et al., 2016). An algorithm previously developed by our group achieved a high performance in many of the evaluated aspects (Larsson et al., 2015). Novel methods were developed, including automatic head compensation of eye-tracker data using an inertial measurement unit to estimate head-movements (Larsson et al. 2016a), and an algorithm using information about moving objects extracted from a video to improve smooth pursuit detection (Larsson et al. 2016b).

#### Linnea Larsson

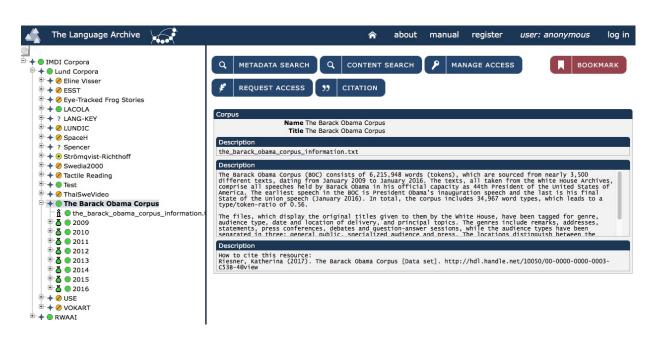
PhD Disseratation

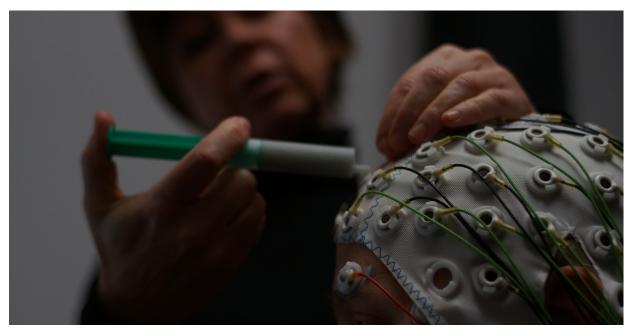
# Consultation

The lab offered consultations on software, technology, and analyses on 90 occasions to internal and external users in the lab i the following areas:

- 3D scanning and visualization techniques
- Audio recording equipment
- corpus server
- Data examination
- EEG cap training,r ecording, and methods
- ELAN consulting
- E-prime programming
- Experimental design

- Experiment set up
- Macro photography and documetation
- Methodology
- Motion capture data collection
- Programming
- Praat
- PsvchoPv
- Python
- Script for data analysis
- Statistics
- Transcribing





# Courses, tutorials and lectures

#### **COURSES**

- Statistical Analysis for Behavioural Sciences I
- Statistical Analysis for Behavioural Sciences II
- ERP Research Methods Theory and Practice
- Eye Tracking
- Programming for the Behavioural Sciences
- Motion Capture Research Methods

#### **TUTORIALS**

- 3D-scanning 3Dhop in Archeology
- 3D-scanning in Archeology
- 3D-scanning: Nextengine
- ELAN: Transcription, coding and analyses
- In the LARM studio: Recording video
- In the LARM studio: TV production
- Introduction to the Humanities Lab
- PsychoPy

#### **LECTURES**

- 3D-scanning: Meshlab and Photoscan
- Blender
- Eye data quality: measuring, calculating and reporting
- Eye tracking methodology in visual studies
- Förutsättningar för grammatisk utveckling
- How do I teach my brain?
- Om hjärnan och flerspråkighet:
- Sanningar och myter kring andraspråksinlärning
- Språkutvecklingsteorier
- Statistical Analysis



## **Visitors**

April 11-15, 2016 **Eva Liina Asu** Tartu, Estland

March 9 – May 2, 2016
Aaron Albin
Pennsylvania State University (PIRE),
USA

March 28 – April 17, 2016 September 25 – October 28, 2016 Tanya Beelders Bloemfontain, South Africa

March 28 – April 17

Kinsey Bice
Pennsylvania State University, USA

November 1–7, 2016

Johan von Boer

Humlab, Umeå university

September 1, 2015 – August 25, 2016, October 15-22, 2016, October 17-21, 2016

Emanuela Campisi University of Catania, Italy

March 7–24 + September 15 – December 15, 2016

Tim Cornelissen

Goethe-Universität, Frankfurt am Main

February 8-26, 2016, August 22-24, 2016 Pheladi Fakude NWU Vaal, South Africa February 19, 2017

Pentti Haddington

University of Oulu, Finland

March 1–31, 2016, Roy Hessels Utrecht University, the Netherlands

February 8–26, 2016 Esté Hefer Jordaan NWU Vaal, South Africa

March 1-31, June 23 – July 7, 2016 Ignace Hooge
Utrecht University, the Netherlands

October 20-28, 2016

Howell Owen Istance
De Montfort University, Leicester, UK

June 22 – August 20, 2016 Oleg V Komogortsev Texas State University, USA

March 2015 – February 2016

John Jr-Hung Lin

National Chiao Tung University, Taiwan

April 11-15, 2016 Francis Nolan Cambridge, UK

November 15-20, December 11-16, 2016
Wendy Sandler

Haifa University, Israel

April 11–15, 2016

Chris Scholes

University of Nottingham, UK

October 20-28, 2016

Oleg Spakov

Texas State University, USA

December 12–15, 2016 Suzanne Toren New York

June 23 – July 31, 2016

Raimondas Zemblys

Šiauliai University, Lithuania

May 15-22, 2016

Nicole Weidinger

LMU München, Germany

## Staff members 2016

#### Felix Ahlner

Corpus Assistant, PhD student Linguistics

#### Annika Andersson

Researcher

#### Niclas Burenhult

Researcher

#### Emanuela Campisi

Researcher

#### Love Eriksen

Researcher

#### Sara Farshchi

Project Assistant, PhD student English

#### Johan Frid

Local Coordinator Swe-CLARIN, Researcher

#### Henrik Garde

Systems Developer

#### Maria Graziano

Researcher

#### Josine Greidanus

Project Assistant

#### Marianne Gullberg

Director

#### Clair Hill

Researcher

#### **Nils Holmberg**

System Administrator

#### Martina Holmgren

Administrative Assistant

#### Kenneth Holmqvist

Researcher

#### Carolina Larsson

3D Assistant

#### Jens Larsson

Project Assistant

#### Stefan Lindgren

Research Engineer, Purchasing Coordinator

#### Fiona Mulvey

Researcher

#### Diederick C. Niehorster

Researcher

#### Jens Nirme

Motion Capture Assistant, PhD student Cognitive Science

#### Marcus Nyström

Researcher

#### Manuel Oliva

Project Assistant, PhD student Cognitive Science

#### Maja Petersson

Administrative Coordinator

#### Peter Roslund

Research Engineer, Purchasing Coordinator

#### Susan Sayehli

Researcher

#### Susanne Schötz

Researcher, Health and Safety Representative

#### Frida Splendido

**Educational Developer** 

#### Alexander Strukeli

Project Assistant, PhD student English

#### Joost van de Weijer

Methodologist, Researcher

#### Cecilia Whitehorn

Financial Administrator

# **Funders**

- The Linnéus Centre Thinking in Time: Cognition, Communication, and Learning
- Crafoordska Stiftelsen
- The Swedish Institute for Educational Research
- LMK (Lars Mikael Karlsson) Foundation
- Lund University
- Joint Faculties for Humanities and Theology





www.humlab.lu.se

#### **LUND UNIVERSITY**

PO Box 117 SE-221 00 Lund Sweden +46 46 222 00 00 www.lu.se