



Annual Report 2015

The past year, 2015, was eventful for Lund University Humanities Lab. It was our first year as a 'distributed Lab' – now with research facilities in the two buildings of the Joint Faculties of Humanities and Theology, namely the Lab@SOL and the Lab@LUX. Over the year, we have developed new routines for organising demos and visits to the Lab. We have also worked hard to raise awareness of our new facilities, the custom-built motion capture lab ready for 3D and virtual reality, and the state of the art audio and video studio called the LARM studio (Ljud, Animation, Rörliga bilder, Musik, 'Sound, Animation, Moving images, Music'), inaugurated at the end of 2014. We have been very lucky to receive generous financial support a second time from Einar Hansen's Allhems Foundation to equip the LARM studio. We are deeply grateful for this support.

The Lab continued its activities and engagement locally, nationally and internationally in the academic arena and in interaction with society. We have more users than ever, and we have become host to new large externally funded research projects; we have new collaborations, courses, seminar series, and as always a string of visiting scholars. We hosted workshops on topics as diverse as theremin playing and on infrastructures for the Humanities. We continue to provide training in the technologies at hand through workshops and courses open to researchers, teachers, and PhD students, as well as organising a steady stream of demo sessions, seminars, etc.

As should be clear from the pages of this Annual report 2015, the Humanities Lab is as dynamic as ever. It is an exciting environment where the Humanities, Theology, and Social sciences can tackle the scientific challenges ahead.

Marianne Gullberg Director of Lund University Humanities Lab Feb. 2016

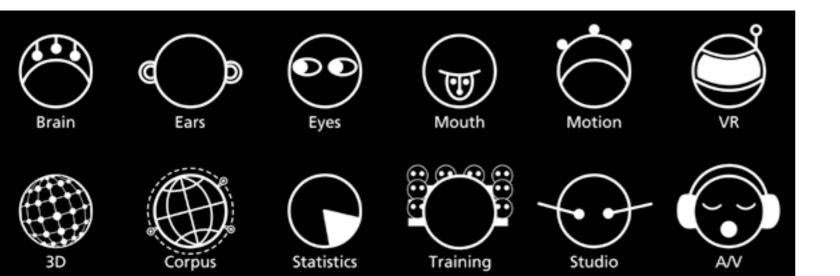
Introduction

Lund University Humanities Lab is an interdisciplinary research and training facility financed 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 campus and beyond. We host technology, methodological know-how, data management and archiving expertise, and a wide range of research projects. 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. Our collaborations include long-term partnerships with secondary schools, joint development of hardware and software solutions with industry, the development of measurement standards, and networks on issues of research infrastructures, data storage and processing. The Lab is a dynamic environment enabling scholars across the JFHT to combine traditional and novel methods, and to interact with other disciplines.

Since August 2014 the Lab has facilities at the Centre for Languages and Literature (in Swedish *Språk- och litteraturcentrum*, abbreviated SOL), and at LUX, the new building for the Joint Faculties of Humanities and Theology. We therefore have the Humanities Lab@SOL and @LUX. Since the expansion in 2014, Lab activities have continued to grow. The Lab currently has approximately 150 registered users in 50 projects.

Brief Facts 2015

150 users | 50 projects | 7 PhD courses | 21 tutorials | 46 lab tours & demos | 5 workshops



Research

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. Examples of such user groups are scholars working in the inter-faculty Linnaeus Centre *Thinking in Time: Cognition, Communication, Learning* (CCL, financed by the Swedish Research Council; see box), but also scholars with smaller research projects as exemplified in this report.

The Lab also hosts its own externally funded research projects, with grants and research groups located in the Lab. In 2015, the Lab hosted five such large-scale projects with affiliated members: an ERC project entitled Language, cognition, landscape (LACOLA, Burenhult); a major collaborative project between Lund, Stanford and Umeå Universities as part of a Wallenberg Network Initiative entitled Culture, brain, learning (Strömqvist, Heller, Gullberg, Smith), funded by the Knut and Alice Wallenberg Foundation; a project called EyeLearn: Using visualizations of eye movements to enhance metacognition, motivation and learning (Holmqvist), funded by the Marcus and Amalia Wallenberg Foundation; a Wallenberg Scholar grant on Embodied bilingualism (Gullberg) funded by the Knut and Alice Wallenberg Foundation; and a new project entitled Language as key to perceptual diversity (LANG-KEY, Burenhult), funded by the Bank of Sweden Tercentenary Foundation Jubilee Initiative.

The Linnaeus Centre Thinking in Time: Cognition, Communication, Learning

The inter-faculty Linnaeus Centre Thinking in Time: Cognition, Communication, Learning (CCL), financed by the Swedish Research Council 2008-2018, is a multidisciplinary centre focusing on the role of timing in cognition, communication, and learning at time scales ranging from the millisecond to years, and examining phenomena from the cellular to the behavioural level. Scholars from Cognitive Science, Psychology, Linguistics, Neurophysiology, and Logopedics, Phoniatrics, and Audiology for example investigate the role of the cerebellum for cognition and learning; the influence of internal simulation of perception and action on cognition; the neurocognitive embedding of language and memory; the interaction between language and bodily movement for learning and communication; and computerassisted forms of learning.





Old and New Projects

AN ERC GRANT COMES TO AN END AND A RJ
JUBILEE GRANT STARTS IN THE LAB

The ERC grant Language, cognition and landscape (LACOLA), a five-year project directed by Niclas Burenhult and funded by a European Research Council Starting Grant, comes to an end in early 2016. The grant remains the only ERC Starting Grant ever to be awarded to the Humanities in Sweden. The project trail-blazed research into how the geophysical environment (the 'landscape') is represented in language and thought, across languages and cultures. It made innovative use of Geographical Information Systems (GIS) and language archiving technologies and facilities provided by the Lab.

A new major grant was also initiated in July 2015, again under Burenhult's direction. Language as key to perceptual diversity (LANG-KEY) is one of eight grants awarded by the Bank of Sweden Tercentenary Foundation Jubilee Initiative New horizons in the humanities and social sciences. The project will explore the linguistic representation of the senses across diverse and endangered speech communities, in collaboration with the disciplines of Geography and History of Religions. The Lab serves as a centre for the interdisciplinary collaboration and innovative use of technology.

EYE TRACKING. In 2015 research using eye tracking continued to flourish. Lab members were active as co-organisers of the world's largest conference on eye movements, ECEM18 in Vienna (Holmqvist), on programme committees for the conference Eye Tracking South Africa (Nyström), and gave keynote lectures at several international conferences in Israel, South Africa, and the USA (Holmqvist). Holmqvist and Lab members also organise the *Lund Eye Tracking Academy* (LETA) workshop twice a year to provide training in eye tracking. LETA has now trained over 450 scholars worldwide. The textbook on eye tracking methodology, authored by Holmqvist and other members of the Lab and first published by Oxford University Press in 2011, will appear in a second edition. New courses on eye tracking were also developed (Nyström) and taught in Turku, Finland.

The research project EyeLearn: Using visualizations of eye movements to enhance metacognition, motivation and learning (Holmqvist), saw the arrival of a postdoc in 2015 (Niehorster). The project builds bridges between education, training, and research using eye tracking to study students' information processing, teachers' feedback on students' visual attention, and the effect on learning.

New research avenues were also launched in 2015. Nyström was a co-applicant on two successful grants from the Swedish Research Council. The project Mental imagery seen from different worlds of thoughts (R. Johansson, M. Johansson, Dewhurst, Nyström) builds on previous work examining mental images using eye tracking techniques. The project Event detection in eye tracking data - method with clinical applications (Stridh, Hammar, and Nyström) brings together scholars from Biomedical engineering, Ophthalmology, and the Humanities Lab. The joint doctoral student with the engineering faculty (L. Larsson), funded by the strategic research area e-Science (http://essenceofescience.se/), completed work on smooth pursuit and automatic event detection, leading to two publications, and a projected PhD defence in early 2016. Other Lab members involved in the Wallenberg project Culture, brain, learning worked on clinical interventions for cognitive deficits in Down syndrome with Stanford (Mulvey). Another line of work in this project used eye tracking to study how visual attention and gaze behaviour interacts with the selection and inhibition of episodic memories (R. Johansson).

External users to the Lab also conducted a range of studies using eye tracking in 2015, for example examining how eye movements reflect thought processes in moral and non-moral decision making

(P. Johansson et al.), and what pupil size reveals about memory (Bjernestedt et al.). A PhD project in English uses eye tracking to study how reading and learning are related, especially when reading is difficult (Strukelj; see box).

Method development is continuous in this domain, involving for example data quality checking routines, the development of new algorithms, demo platforms, etc.

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 developed a new EEG course (Andersson, Garde; see Training and Teaching).

Research projects exploiting the technology include the project *Culture, brain, learning* (Gullberg, M. Johansson, M. Lindgren) where three postdoctoral subprojects use these techniques to improve our understanding of memory for narratives. The projects examine crosslinguistic effects on comprehension in the semantic domain of placement (A. Andersson); the effects of visual attention and information availability on episodic memory retrieval (R. Johansson); and the neural mechanisms underlying episodic memory and factors determining memory accessibility (Bramão). External users included a Wallenberg Fellow project (Roll, Schremm, Söderström, Novén inter al.) that traces the brain networks that support interaction between language melody (intonation) and grammar in language processing. Other projects using this technique explored how Swedish speakers process relative clauses (Wiklund et al.).

3D SCANNING, VIRTUAL REALITY (VR). The use of 3D and VR techniques continued to grow especially in the domain of archaeology and cultural heritage. For example, Lab members worked to create a virtual copy of the mummified 17th century Danish-Swedish bishop Peder Winstrup, exhumed in Lund in 2013 (Karsten, C. Larsson, Lindgren). A follow-up study involved macro photography of king Valdemar's sarcophagus at Sorø Academy in Denmark (Garde, Lindgren) where the bishop went to boarding school 1618-1623. In collaboration with the Linnaeus University another project examined digital solutions in museum environments to bring the past to life (Petersson, C. Larsson). As a good example of such solutions, the Lab (Lindgren) helped produce a film for the Swedish Pompeii project showing the reconstructed villa of Caecilius lucundus (http://www.pompejiprojektet.se/#). The Lab was also involved (Lindgren) in a large scale international project seeking to reconstruct the sensorial experiences of the past using multimedia, targeting the world of late medieval nuns (http://sensescapes. asu.edu/). Another international endeavour sees the Lab (Lindgren) attempting to create a plan of the ancient city of Hermione in Greece. 3D-scans of ancient remains will be connected in a GIS-system, allowing scholars to probe the layout of the ancient city lying underneath the modern one.

Much work also focuses on method development, for example pushing hardware and software issues forward to enable the use of collected data to be visualised and viewed in devices such as cardboard 3D-viewers holding smart phones with 3D-apps. Another line of work targets interactive visualisation, or tracking and streaming of motion capture data in real time. Other issues include automating postprocessing of 3D photo techniques to save time and reduce errors (Garde, C. Larsson,



"The Lab's role as a hub of interdisciplinary collaboration and host of innovative humanities technology ensures an excellent intellectual and infrastructural environment [...]"

- Niclas Burenhult, holder of an ERC grant; recepient of a Jubilee Grant, Bank of Sweden Tercentenary Fund



Lindgren). As part of this focus, the Lab has also developed a new course on Motion capture research methods to be offered in 2016.

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, Gullberg, Gulz, Haake). 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. In other domains the motion capture system was used to examine movements in patients with knee injuries (Ageberg, see box).

Here too, much work was devoted to method development. For example, work was done to improve motion capture recording at difficult angles, and improving automated data replacement when markers are occluded or lost (Garde).

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

SOUND AND FILM FACILITIES. Activities in the new *LARM-studio*, the state of the art facility for professional level audio and video recordings, took off in 2015. The studio was the empirical home of an Advanced Study group at the Pufendorf Institute of Advanced Studies. The project *Artistic Vocal and Choral Orders* (Geisler et al.) aimed to understand vocal practices at an individual and a group level and how space, the body, and visual aspects influence such practices (see box). The project organised workshops with performers in the LARM-studio and at the Pufendorf Institute drawing on Lab resources and expertise (Roslund). The studio also hosted activities such as the podcasts of the Joint Faculties of Humanities and Theology, and academic courses in music production by the section of Musicology. It was also used to create audiovisual stimuli for electrophysiological experiments, for example (Andersson), and to produce so-called *Massive Open Online Courses* (MOOCs) at LU (Ljungqvist).

The anechoic chamber was used in studies on vocal communication and voice treatment (the Linnaeus Centre CCL), in the production of educational materials (pronunciation exercises, for example),

and auditory research stimuli and materials, such as in a project studying foreign accent in Swedish (Tronnier), and a project developing a language game to learn Swedish lexical tone (Ewald, Roll).

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 2015, the corpus server comprised 2.5 TB data, and new data ingested included the *ESST Estonian Swedish dialect corpus* (Schötz); data from the ERC project *Language, cognition, and landscape* (Burenhult), data from the *Repository and workspace for austroasiatic intangible heritage* (RWAII) concerned with endangered languages (Burenhult, Kruspe); and *Exotic vowels in Swedish* (Schötz).

Since 2014 the Humanities Lab is also a member of the Swedish national consortium for language technology, *Swe-CLARIN* (http://sweclarin.se), itself a part of a European Research Infrastructure Consortium CLARIN (Common Language Resources and Technology Infrastructure; http://clarin.eu/). This consortium aims to provide scholars with easy and sustainable access to language resources as escience, that is, digital language data (in written, spoken, video or multimodal form), and advanced tools to discover, explore, exploit, annotate, analyse or combine them. CLARIN is of increasing importance because of the sheer volume of "born-digital" language data available, but also large-scale digitisation of our cultural heritage, and the increasing visibility and importance of e-science in all fields.

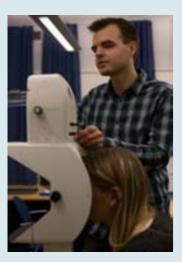
As a member of Swe-CLARIN, the Humanities Lab provides tools and expertise related to language archiving, corpus and (meta)data management, with a continued emphasis on multimodal corpora, many of which contain Swedish resources, but also other (often endangered) languages, multilingual or learner corpora. Swe-CLARIN work started in earnest in 2015 with a kick-off meeting in Gothenburg. Throughout the year, the local coordinator (Frid) and/or the Lab Director (Gullberg) attended 4 virtual meetings, and a consortial meeting in Stockholm (Frid). The Lab also participated in the First Annual Meeting Nordic CLARIN Network (Frid) with a presentation on the keystroke logging software ScriptLog. In March, a workshop was held in Lund for the national steering committee's site visit. Other related events included a workshop on infrastructures for the Humanities with representatives from DigHumLab Denmark. The research activities included the initiation of pilot projects under the guidance of the local coordinator (Frid). For example, one project develops a probabilistic syllable lexicon to be used in experimental work. In a frequency weighted syllable lexicon you can look up in which words a particular syllable (including its prosodic features) occurs and also get an estimate of how frequent the syllable is. Another project involving scholars from Lund, Växjö and Lancaster, UK, seeks to develop a tool to help scholars study blogs by relatives of cancer patients in order to examine how they talk about cancer, and especially their metaphors for illness.







User project:



Alexander Strukelj,
Dept. of English
PhD project How our expectations
change the way we read and perceive written texts

This project examines the effect of expectations, opinions, and previous experiences on how we read written texts. Results show that non-detected textual incongruities are processed, but that this parse is discarded in favor of the expected word. By understanding how expectations change our reading, we can design better learning materials, informational messages, and ultimately improve communication.

Other Lab members were also active in the area of e-science for the Humanities, for example co-organising a panel session on multimedia resources for hunter-gatherer research in Vienna (Burenhult), discussing 'New Horizons for the Humanities and Social Sciences' (a seminar organised by the Bank of Sweden Tercentenary Foundation; Burenhult), and attending meetings held by the Swedish National Data Service (J. Larsson). The local seminar series *Digital tools for the Humanities* also attracted attention especially in view of the increasing interest in so-called Digital Humanities.

OTHER AREAS. Work on multimodal analysis of human behaviour (speech and gesture) continued. 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). A PhD project also targeted gestural cohesion in German discourse including reactions to gestural inconsistency (Debreslioska, Gullberg). Three other PhD projects en route under Gullberg's guidance also targeted speech and gesture exploring the role of gestures in adult word learning (Kutchsh), multimodal conceptual metaphors (Christensen), and the integration process of speech and gesture information and its effect on memory (Nirme). Lab members also taught (Graziano) and lectured (Graziano, Gullberg) on multimodality internationally. Method development involved the automation of routines to avoid error prone manual treatment of exported data from ELAN (Garde).

Other work examined the writing process. The project *Expert writing - divine inspiration or hard work?* (V. Johansson), funded by the Swedish Research Council, combined eye tracking with keystroke logging to investigate how experts write and read their own text as part of the creative process. This work builds on previous successful projects using keystroke logging to study linguistic production in the written modality.

In another domain, the Lab shares a postdoc (Ingi Adalbjörnsson) with the dept. of Applied Mathematics at LU (Vang Andersen). The postdoc project brings together Applied mathematics and Cognitive science (Wallin) to develop statistical tools to study recommender systems (e.g. systems that allow your online shop to use your history to recommend other things you may like). The project fruitfully draws on joint expertise on human decision making on the one hand, and statistics on the other.

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 create a linguistic corpus and 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.

PhD courses, taught by Lab members, are offered to PhD students for credit (7 in 2015). 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 2015 by the pedagogical developer (Splendido) to meet the demands of new users asking for specific elements (21 tutorials in 2015). Six are new, specifically in the domains of 3D scanning, and audio-video recordings in the LARM studio. *Lund Eye Tracking Academy* also offers intensive workshops on eye tracking with many international participants. Lab members also give lectures on a range of topics as part of other regular courses offered at the Joint Faculties.

The consultation work is also extensive (104 recorded occasions in 2015). Methodological and statistical guidance for research projects within and outside the Lab continues to grow. The Lab programmer (Garde) and the in-house methodologist (van der Weijer) both contributed to meet the increasing needs for sophisticated support.

User project:



Per Davidson,
Dept of Psychology
Phd Project: The effect of sleep on
emotional memory

This project uses skin conductance responses, a physiological measurement of arousal, to examine whether fear transfers from one type of material to another that looks similar. A key question is whether sleep influences the degree of transfer. This is an important research question because it helps us understand how sleep is involved in memory consolidation. It can also tell us whether it is adaptive or not to sleep right after a traumatic experience, something that is currently hotly debated.

User project:



Nicolò Dell'Unto,
Dept. of Archeology
3D GIS: Development of new research methodologies for the documentation and analysis of archeological sites.

Geographic Information Systems (GIS) and 3D acquisition technology open up novel documentation methodologies in archaeology. With sophisticated database management systems (GIS) and accurate 3D replicas of a site, at different steps of its investigation, archaeologists can now map the metamorphosis that characterizes any archaeological investigation, preserving the material information virtually which would otherwise permanently be removed during the field activities. This project studies how the combination of 3D models and 3D geographic systems can be employed to generate accurate interpretations of the past, by providing archaeologists and cultural heritage specialists with an opportunity to simulate past scenarios while keeping accuracy of details.

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.

Through its members, the Lab is involved in large international networks related to eye tracking and eye movement data, such as the *Eye Movement Researchers' Association* (EMRA); *Communication through Gaze based Interaction* (COGAIN), and the *Committee for Eye Data Quality* (EDQ; Holmgvist, Mulvey).

Similarly, in the field of 3D scanning, the Lab has several international collaborations through its members (S. Lindgren, C. Larsson). These networks include the *Lund University Historical Museum*, the *Centre for Textile Research* in Copenhagen, Denmark, the *Swedish Institute in Athens*, and the *University of Verona*, Italy.

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. The local coordinator (Frid) was involved in a range of pilot projects in 2015 (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.

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. An ongoing joint PhD project with the Engineering Faculty on event detec-

tion in eye movement data (L. Larsson, Nyström) is about to be completed (projected defence in early 2016). The Lab is also linked to *Lund Bio-Imaging Centre* in this network. 2015 saw the completion of a joint solution for optimizing data flows, large databases, heavy data computation, and data visualisation, achieved through the assistance of *LUNARC*, the Lund University Center for Scientific and Technical Computing. 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 2015 in Stockholm with a presentation on *3D Data in Cultural Heritage* (Lindgren).

The Lab is part of a *Wallenberg Network Initiative* linking Lund, Stanford, and Umeå Universities through generous funding by the Knut and Alice Wallenberg Foundation. This initiative promotes the exchange of technology and methodological expertise across all three universities, as well as technological compatibility. A large-scale research project is also embedded in the initiative. The Lund-Stanford project, entitled *Culture, brain, learning*, engages some 30 scholars in a range of subprojects across three domains: Narrative, Reading, and Improving learning. Lund contributed in all three domains in 2015 in collaborative projects with Stanford (M. Johansson, M. Lindgren, Bramão, R. Johansson, Mulvey, Wagner), partly also involving scholars in the Linnaeus Centre *Cognition, Communication, and Learning* on topics of computer assisted learning (Gulz, Haake, Schwartz), and on so-called choice blindness (Hall), etc. The Humanities Lab serves as a hub for these activities, promoting the cross-fertilisation and fruitful exchange and expansion of ideas and networks.

The Wallenberg Network Initiative further links the Lab to HUMlab Umeå and work within Digital Humanities, a burgeoning field where the Lab 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 (see further Visibility, access, outreach).

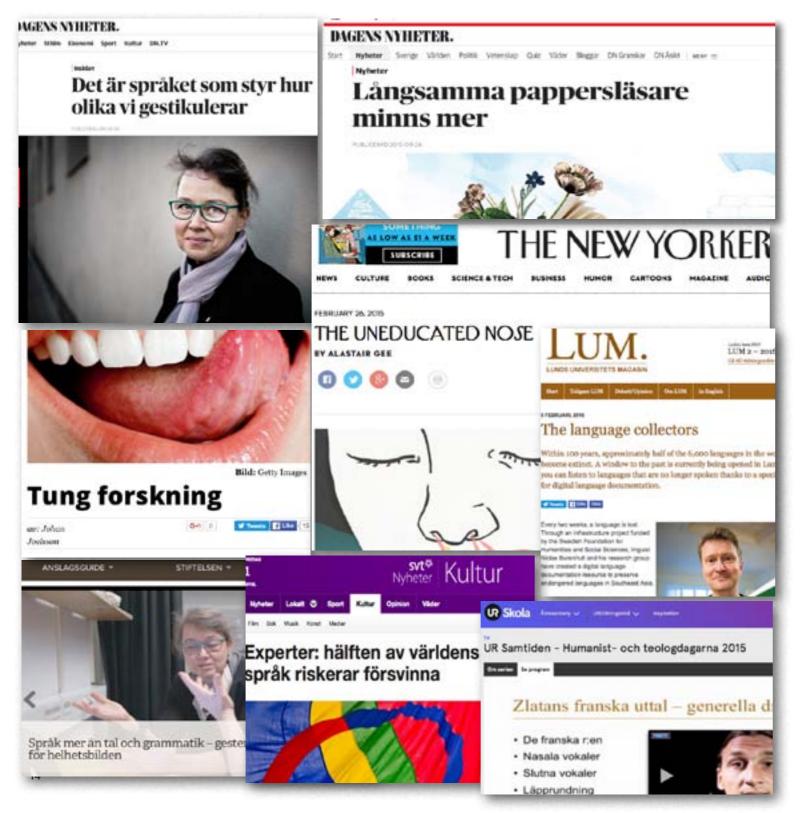
The Humanities Lab is also a partner in a number of international centres such as the Centre for Multilingualism in Society across the Lifespan, Oslo; Advanced Studies on Language complexity, Lyon; and the National Centre for Reading and Educational Research, Stavanger, Norway. The Lab also acts as the 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 includes nine universities worldwide and focuses on training and exchange. In 2015, the Lab hosted two American visiting PIRE scholars, and saw a joint conference presentation

User project:



Rachel Elsinga, Dept of Psychology PhD project: Visual processing during pictorial memory task in 3-6 year old children (pilot)

This project studies how typically developing children aged 3 to 6 years see the world and how they learn from what they see. It combines eye tracking and classical psychological tests to investigate the development of integrated visual processing. To adjust the setting of eye tracking to young children, the project has built a rocket that children can sit in. This line of study can hopefully help us understand how to help children at risk (for example preterm born children, children at risk for ADHD, autism and/or dyslexia) – a deeply interdisciplinary enterprise.



based on previous research collaboration within the network (Jackson, Hotchner, Greidanus, Gullberg).

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.

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 (46 tours and lab demos in 2015 for local, national, and international visitors). In 2015 we hosted visitors such as local schools, the University Hospital, Ambassadors and representatives from the Ministry for Foreign Affairs, the Swedish Minister of Higher Education and Research, 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. In 2015, we launched a new group tutorial called *Introduction to the Humanities Lab* (Splendido et al), which allows novices to try out a number of things in the Lab. We also organised and participated in three workshops on Infrastructures and infrastructural support for the Humanities, on issues of escience, 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. In 2015 the seminar series was regularly attended by participants from other Swedish universities, by library experts, and by members of the Swedish National Data

Service (SND), thus widening the impact of the Lab seminar. In the seminars local and invited speakers from Sweden and abroad addressed such issues as database solutions for publishing and networking on the internet (Åhlfeldt); methods for presenting historical records and books online (Nilsson Hammar, Östlund); scholarly printed publications vs. digital publications (Sundin); crowd-sourcing and 'peer-sourcing' (Göransson); multimodal corpus linguistics (Knight), and how to make research data available via SND (Arvidsson). An open roundtable addressed how 'invisible' research data in the Humanities can be made more visible. Further, in November the Lab co-hosted a national workshop entitled Digital Humanities: Opportunities and Challenges in collaboration with the Joint Faculties, and the project Digital Cultures (Haider et al.). Participants came from the Centre for Digital Humanities, Gothenburg, HUMLab, Umeå, Linnéuniversitetet, and NTNU Trondheim/University of Cologne.

As stated above, 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 on the theme Geniuses. Lab members gave popular talks and also demonstrations of technology to the public. As part of these outreach activities, we developed a Lab demonstration film (Roslund, Garde), but also short video clips and slideshows, for example on EEG research (Andersson, Sayehli), on linguistic

User project:



Ursula Geisler, Karin Johansson, Viveka Lyberg Åhlander, Sara Wilén, Sverker Zadig,
The Pufendorf Institute for Advanced Studies

AVACO

The project Artistic Vocal and Choral Orders (AVACO) examined vocal practices at an individual and a group level to investigate how factors such as space, the body, and visual aspects influence such practices. The project organised workshops with performers in the LARM-studio and at the Pufendorf Institute for Advanced Studies at

corpus work (Burenhult et al.), and on 3D renderings of archaeological material (Lindgren, C. Larsson).

The outreach activities also included popular media. Members were interviewed in *Språktidningen* (Frid, Gullberg, Schötz), a specialist magazine about language, and in *Dagens Nyheter* (Gullberg, Holmqvist), a national newspaper. Members also appeared on Swedish national television on *Kunskapskanalen* (the Knowledge channel), talking about language learning and gestures (Gullberg), and about footballers and their multilingual skills (Splendido, Granfeldt). The team in and around the ERC-project *Language*, *cognition and landscape*, appeared in international media discussing the language of smell and endangered languages in *the Economist*, *the New Yorker*, *New Scientist*, *the Daily Mail*, and *the Guardian* (Burenhult, Majid), as well as on Swedish national television *Kulturnyheterna* (Culture news; Burenhult).

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

Research grants, awards and honors

NICLAS BURENHULT

Jubilee Grant Language as key to perceptual diversity: an interdisciplinary approach to the senses.

Bank of Sweden Tercentenary Foundation (Riksbankens Jubileumsfond)

MARIA GRAZIANO

Bimodal narratives: Crosslinguistic perspectives on the interplay between speech and gesture in narrative discourse Åke Wibergs Stiftelse

MARIANNE GULLBERG

Cohesion is heard and seen: A crosslinguistic study of gesture articulation in sustained discourse

The Crafoord Foundation (Crafoordska Stiftelsen)

On June 10 Marianne Gullberg was elected member (number 1682) of the Royal Swedish Academy of Sciences, dicipline/class X of Humanities and for outstanding services to science.

SUSANNE SCHÖTZ

Melody in human-cat communication (Meowsic)

The Marcus and Amalia Wallenberg foundation (Stiftelsen Marcus och Amalia Wallenbergs Minnesfond)

THE LARM-STUDIO

Donation

Einar Hansens Allhemsstiftelse

Media

- Burenhult, N. SvT Kultur:
 Experter: hälften av världens
 språk riskerar försvinna (Feb 9:);
 Research on the topic Smell and
 Language in The Economist (Feb
 21), The New Yorker (Feb 26),
 New Scientist (March 25), Daily
 Mail (March 30), The Guardian
 (March 31).
- Frid, J & Schötz, S, Språktidningen: Tung forskning. (June)
- Gullberg, M. Kunskapskanalen SvT: Hur lär man sig ett språk?
 Kunskapskanalen (Dec 16).
- Gullberg, M. Dagens Nyheter Det är språket som styr hur olika vi gestikulerar, (Dec 9)

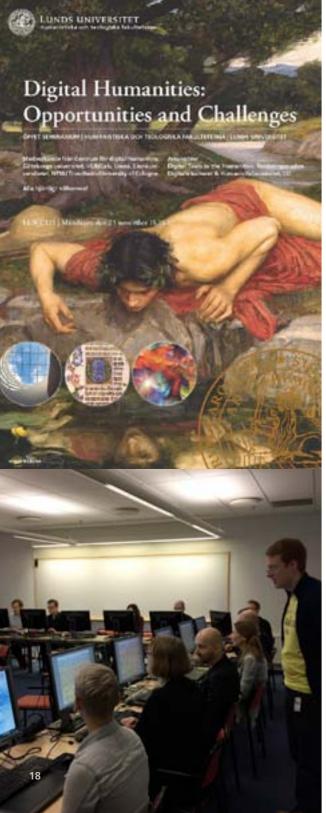
- Gullberg, M. Språktidningen: Glasklar brytning i gesterna. (March)
- Holmqvist, K. Dagens Nyheter: Långsamma pappersläsare minns mer (Sept 26)
- Splendido, F & Granfeldt, J.
 HT-dagarna 2015 och Kunskapskanalen SvT: Zlatan – ett flerspråkigt bollgeni.

User project:



Eva Ageberg,
Health Sciences
Movement quality in people with
knee injury: Validity of visual rating
of and contributing sensorimotor
factors for postural orientation
errors

This project focuses on knee injuries. It examines the validity of visual observation of movements against 2D and 3D data from motion capture. The goal is to develop a measurement tool that can easily be used clinically for screening risk of knee injury and to address functional limitations in people with knee injury. The project also examines the importance of muscle strength (e.g. in the trunk) and muscle activation for different movements (e.g. jumping). The results can contribute to the design of appropriate strategies for prevention and rehabilitation of knee injury.



Seminar series

DIGITAL TOOLS IN THE HUMANITIES

Humanities Lab and Joint Faculties of Humanities and Theology, Lund

2015-01-26 Johan Åhfeldt: Database solutions for publishing of data and networking on the internet

2015-02-26 Anna Nilsson Hammar and Joachim Östlund: LUB Digital Archive: Mehods for presenting historical records and books for students, teachers and scholars

2015-03-30 Olof Sundin: On the scholarly printed publications vs the digital publications and the "individual" and the "collaborative" within the humanities and social sciences: What do we see today, and what could we see in the future?

2015-04-27 Elisabeth Göransson: On aspects of crowdsourcing and "peer-sourcing"

2015-10-14 "Hur gör vi våra osynliga forskningsdata synliga?" Round table discussions 2015-11-23 Digital Humanities: Opportunities and Challenges

Participants from the Centre for digital humanities, Gothenburg, HUMLab, Umeå, Linnéuniversitetet, and NTNU Trondheim/University of Cologne.

2015-11-27 Sofia Arvidsson, SND: How to make your research data available via SND

EYE-TRACKING SEMINAR

Humanities Lab, Lund.

21 weekly seminars, both working seminars and with invited guests during 2015.

Lab Demos

During 2015, the lab hosted 46 lab demos

International visitors:

- AS Datel, Estonia
- University of Cambridge
- Cardiff University
- University of Copenhagen
- University of Essex
- University of Florida
- University of Hong Kong
- Université Lumière de Lyon
- University of Michigan
- University of Nottingham
- University of Oregon
- University of Oslo
- University of Strasbourg
- Syddansk universitet

National visitors:

- Students and employees at Lund University (Archeology; the Biomedical Center; the University and Faculty administration; Educational sciences; Phonetics; Logopedics, Phoniatrics, and Audiology; Musicology; Philosophy; Psychology; Teacher Training Programme)
- Construction consultants, Akademiska Hus
- Kunskapsskolan Lund
- Lund Innovation System
- Lundinova AB
- Lund University Hospital
- Children from the Malmö Red Cross "Läxhjälpen"
- Gothenburg University
- Ambassadors from the Ministry for Foreign Affairs, members from Skåne County Administrative Board, and Lund Municipality
- NETL Conference (Network for Enhancing Teaching and Learning in Research-Intensive Universities)
- the Philology congress, Centre for Languages and Literature, Lund University
- Swedish University of Agricultural Sciences
- Stockholm University
- Swe-CLARIN Steering committee
- the Swedish minister for Higher Education, LU vice chancellor, and pro-vice chancellor for research
- the Swedish Science Council
- Tobii AB

Conferences and workshops

March 11, 2015

Workshop Swe-Clarin national committee site visit Lund University Humanities Lab Johan Frid, Marianne Gullberg, Jens Larsson

March 27, 2015

Workshop Infrastructures for the Humanities Lund University Humanities Lab Marianne Gullberg, Johan Frid, Jens Larsson, DigHumLab Dk

October 16 and October 19, 2015

Workshop on Infrastructural Support on Grant Writing (in Swedish)

Joint Faculties of Humanities and Theology, Lund University

Marianne Gullberg

October 16, 2015

Workshop Theremin with Pamela Kurstin Musicology, LARM Studio, Lund University Humanities Lab Peter Roslund et al.

November 23, 2015

Workshop Digital Humanities: Opportunities and Challenges Lund University Humanities Lab; the Joint Faculties of Humanities and Theology; Digital Culture

Elisabeth Göransson, Marianne Gullberg, Anne-Marie Leander Touati, Samuel Rubensson, Jutta Haider

Consulting

The Lab offered consultations on software, technology, and analyses on 104 occasions to internal and external users in the following areas:

- Audio recording equipment
- BioPac instructions
- Say after me and pronunciation exercises
- Discussant at luPOD seminar on grant applications
- E-prime
- Eye-tracking analysis
- Lättlästutredningen
- Matlab coaching

- Matlab EEG
- Praat
- PsychoPy
- Statistics
- Syllabified lexicons
- Web-based perception tests

Courses, tutorials, and lectures

The lab offers PhD courses accrediting students with 7,5 higher educational credits, but also short group tutorials. Staff members from the lab are also often invited as guest lecturers in other courses within and outside the university. During 2015, the lab offered the following:

COURSES

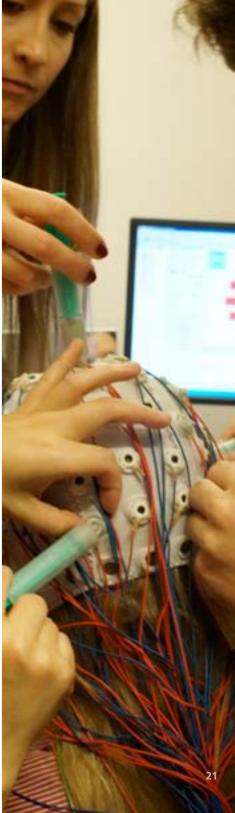
- Experimental design
- Statistical analysis for behavioural science I and II
- ERP research methods theory and practice
- Eye tracking
- Programming for the behavioural sciences

TUTORIALS

- Introduction to the Humanities Lab
- 3D scanning
 - 3D Scanning and postprocessing triangulation scanner
 - 3D scanning and postprocessing light interference scanner
 - 3D in archeology
 - Introduction to 3D scanning
- Audacity basic sound recording and editing
- CLAN 1 transcribing for beginners
- CLAN 2 analysing
- PsychoPy setting up an experiment
- LARM studio courses audio and video recording

LECTURES IN OTHER COURSES

- Statistics in corpus linguistics
- Eye tracking
- Recordings and analyses of ERP data
- Cap training for new users of Easycap
- Speech and gesture in faceto-face communication: cross-cultural and crosslinguistic variations
- History of communication in television archives. Political communication
- Theories on language development
- Requirements for grammatical development
- Multilingualism and interculturalism
- Presentation of the Humanities Lab to new PhD students in the Humanities
- Brain and learning





Conference presentations

is not uniform: En ERP study of verb-second word order

Cognitive Neuroscience Society meeting, San Francisco, USA Annika Andersson, Susan Sayehli, Marianne Gullberg

ScriptLoa

Nordic Clarin Network, Copenhagen, Denmark Johan Frid

Tongue articulation of front close vowels in Stockholm, Gothenburg and Malmöhus Swedish

International Congress of Phonetic Sciences, Glasgow, UK Johan Frid, Susanne Schötz, Lars Gustafsson, Anders Löfqvist

Do gestures compensate for speakers' expressive difficulties?

5th Conference of Scandinavian Association for Language and Cognition (SALC V), Trondheim, Norway

Maria Graziano, Marianne Gullberg

Methodological considerations for the study of intra-sentential code-switching

The 10th International Symposium

Native word order processing on Bilingualism, Rutgers University, NJ. USA Marianne Gullberg

> Learning grammatical gender in a new language: The impact of prior language learning experience at first exposure

> The Psychonomic Society Annual Meeting, Chicago, IL, USA Carrie H. Jackson, Julia Hotchner, Josine Greidanus, Marianne Gullberg

> Skanning av byggnader och föremål. Kyrkornas timmermanskonst

Kulturen, Lund Stefan Lindgren

Virtual blindness? A choice blindness experiment with a virtual experimenter

Intelligent Virtual Agents (IVA 2015). Delft, Netherlands Jens Nirme

Compensation for a large gesture-speech asynchrony in instructional videos

Gesture and Speech in Interaction (GESPIN), Nantes, France Jens Nirme

Influence of pupil size on the dynamics of the eye tracker signal

European Conference on Eye Movements, Vienna, Austria Marcus Nyström

Code-switching within the noun phrase - Evidence from three corpora

The 10th International Symposium on Bilingualism, Rutgers University, NJ, USA M. Carmen Parafita Couto. Marianne Gullberg

Digital Pasts: Re-creating pasts in Susanne Schötz, Johan Frid, Malin museum settings as architecure or flesh and blood?

Nordic Tag, Copenhagen, DK Bodil Persson, Carolina Larsson

Similarity matters online: An ERP study of the processing of word order in L2 Swedish

28th CUNY conference on human sentence processing, University of Southern California, USA

Susan Sayehli, Annika Andersson, Marianne Gullberg

A pilot study: Acoustic and articulatory data on tonal alignment in Swedish word accents

International Congress of Phonetic Sciences, Glasgow, UK

Svensson Lundmark

Voice onset time in heritage speakers and second language speakers of German

International Symposium on Monolingual and Bilingual Speech, Chania, Crete, Greece Joost van de Weijer

The perception of intermediates results from an eye-tracking expe-

Workshop "Contrast in perception. cognition and language", Verona, Italy Joost van de Weijer, Marcus Nyström

Invited talks & guest lectures

Intervention studies with children at the Brain Development Lab at UO

Linneaus Centre Cognition, Communication, Learning, Lund Annika Andersson

On analyses of electrophysiological data in combination with behavioural data in language research COMPUTE research school, Lund Annika Andersson

Ditt förstaspråks grammatik påverkar hur din hjärna bearbetar dina andraspråk Grammatikdagen, Lund

Annika Andersson, Susan Sayehli, Marianne Gullberg

Inför Almedalsveckan: En hjärna Annika Andersson med flera språk [For the Almedalweek: A brain with several langu-

Invited guests and general public, Lund Annika Andersson

En hjärna med flera språk [A brain with several languages]

Almedalsveckan through CCL, Visby, Sweden Annika Andersson

Pedagogisk neurovetenskap

Network meeting, Stockholm University, Sweden

'Mapping categories of the past and present for the future: huntergatherer motion'.

American Association for the Advancement of Science (AAAS) Annual Meeting, San Jose. Presentation at the invitation of the European Research Council.

Niclas Burenhult

Presenter and discussant at 'New Horizons for the Humanities and Social Sciences'

Seminar organized by the Bank of Sweden Tercentenary Foundation, Stockholm.

Niclas Burenhult

Do gestures have a compensatory function during expressive difficulties?

Workshop on Gesture-Speech Integration in Childrens' Narratives, Munich, Germany

Maria Graziano

Att få grepp om betydelse: Vad gester avslöjar om språk och språkinlärning

The Royal Swedish Academy of Letters, History and Antiquities, Stockholm Marianne Gullberg

Språk, hjärna och lärande: Nya perspektiv på språkinlärning, flerspråkighet och språkundervisning

Fund-raising campaign Jubileumssällskapet, Lund *Marianne Gullberg*

Implicit language learning at first exposure across the lifespan - behavioural and neurocognitive evidence

Centre for Literacy and Multilingualism, University of Reading Marianne Gullberg

Why gestures are not (only) a compensatory device - evidence from language learners

Institute of Cognitive Science, Osnabrück University Marianne Gullberg

Language learning in 7 minutes? 2015 Behavioural and neurocognitive ETSA evidence for implicit learning at first Kenne exposure across the lifespan

School of Psychology, University of Nottingham

Marianne Gullberg

Språkinlärning och flerspråkighet i ett psykolingvistiskt och multimodalt perspektiv

The Royal Swedish Academy of Sciences, class X, Stockholm

Marianne Gullberg

Att få grepp om betydelse: Vad gester avslöjar om språk och språkinlärning

Uppsala Senioruniversitet Marianne Gullberg

Marianne Gullberg

Keynote: Speaking and gesturing in language acquisition and bilingualism: The bimodal challenge LangNet Closing Conference, Tampere

Att forska om språk, hjärna och lärande i Humlabbet

Joint Faculties of Humanities and Theology, Lund

Marianne Gullberg

Keynote: Eyetracking methodology/ Mental imagery and eye-tracking 1st Israeli Eye-tracking Conference, Tel-Aviv, Israel Kenneth Holmqvist

Keynote: Eye-tracking South Africa 2015

ETSA 2015, Vanderbijlpark, South Africa Kenneth Holmqvist

Keynote: Measures and visualizations from eye movement data

ETVIS (First Workshop on Eye Tracking and Visualization), Chicago, USA Kenneth Holmqvist

3D printing

Center for Textile Research, Copenhagen, Denmark

Carolina Larsson

3D-data in cultural heritage

Swedish e-Science Academy eSSENCE, Stockholm Stefan Lindgren

3D-documentation of Pompeii

Center for Textile Research, Copenhagen, Denmark
Stefan Lindgren

Eye-tracking – a tool to understand human behavior

Seminar in Mathematics Education, Örebro University, Sweden Marcus Nyström

Exotic vowels and word accents in regional varieties of Swedish

Satellite Workshop to Phonetics and Phonology in Europe 2015, Cambridge, UK Susanne Schötz

Visitors

Alena Holubcová

Masaryk University, Brno, Czech Republic

Ignace Hooge

Utrecht University, the Netherlands

Roy Hessels

Utrecht University, the Netherlands

John Jr-Hung Lin

National Chiao Tung University, Taiwan

Ciella Villasco

SMI SensoMotoric Instruments GmbH, Milan, Italy

Jasmin Leber, Irene Skuballa University of Freiburg, Germany

Carla Fernandez

Pennsylvania State University, USA

Dawn Knight

University of Cardiff, UK

Halszka Jarodzka

Open Universiteit Nederland Heerlen, the Netherlands

Ellen Kok

Maastricht University, the Netherlands

Nerijus Ramanauskas

Enigma Software Group USA

Paul McGraw, Neil Roach, Chris Scholes

University of Nottingham, UK

Chelsea Krajcik

School of Oriental and African Studies, University of London, UK

Naomi Levy

Bar Ilan University, Israel

Beatrix Emo

The ETH Zürich, Switzerland

Yesim Sevinc

University of Oslo, Norway

Toke Reinholt Fosgaard

Copenhagen Business School, Denmark

Cenek Sasinka

HumeLab, Brno, Czech Republic

Warren Ward

Fourward Technologies, USA

Samuel Hutton

University of Sussex, UK



Staff members 2015

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Annika Andersson

Researcher

Niclas Burenhult

Researcher

Emanuela Campisi Researcher

Love Eriksen

Researcher

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Henrik Garde

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Maria Graziano

Researcher

Project Assistant

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Project Assistant, PhD stu-

Methodologist, Researcher

Researcher

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Marcus Nyström Researcher

Manuel Oliva

Project Assistant, PhD student Cognitive Science

Maja Petersson

Administrative Coordinator. Directory Administrator

Peter Roslund

Research Engineer, Purchasing Coordinator

Susan Sayehli

Researcher

Åsa Sang Researcher

Susanne Schötz Researcher

Funders

CRAFOORDSKA STIFTELSEN

EINAR HANSENS ALLHEMS STIFTELSE

KNUT OCH ALICE WALLENBERGS STIFTELSE

RIKSBANKENS JUBILEUMSFOND

STIFTELSEN MARCUS OCH AMALIA WALLENBERGS **MINNESFOND**

VETENSKAPSRÅDET (LINNÉUS CENTRE CCL)

ÅKE WIBERGS STIFTELSE

THE JOINT FACULTIES OF HUMANITIES AND THEOLOGY





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