

# Lund University Humanities Lab

A SELECTION OF USER PROJECTS 2019–2023





## Welcome!

This little book gives a few examples of the many exciting and innovative research projects being conducted in Lund University Humanities Lab. The Lab is a research infrastructure open to anyone interested in human behaviour, cognition, communication, and culture. The projects in this book illustrate some of the many disciplines, questions, methods and approaches you can find in the Lab.

Enjoy this smorgasbord. Bon appétit!

*Marianne Gullberg,  
Director Lund University Humanities Lab*

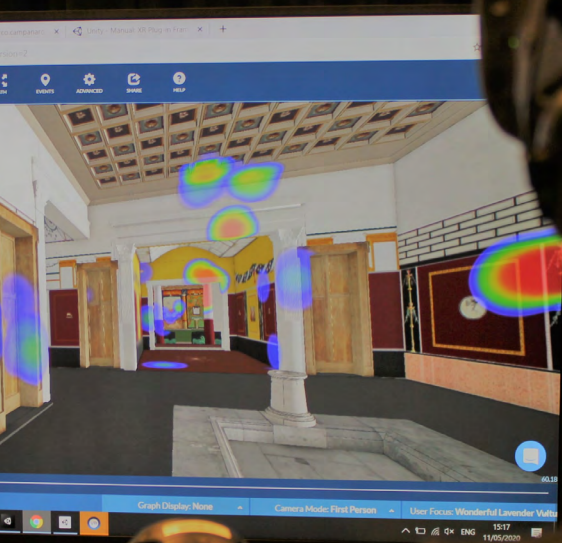


## Signing avatars on stage

*Crea (Sweden's National Touring Theatre and their group for dramatic art in Swedish Sign Language)*

In this project the Lab's Mocap/3D team collaborated with Riksteatern Crea to create a signing avatar to act on stage with living actors in real-time. This project combined three different mocap systems capturing different parts of the body: (i) the optical mocap system capturing the main body (torso, head, legs and arms), (ii) stretchsense gloves capturing the movement of the hands and fingers, and (iii) a mobile phone system capturing the face (where many grammatical features are signaled in sign language). The data from the three systems were synchronously mapped onto a 3D avatar, creating a live 3D rendering of the signer producing fully comprehensible sign language.





## Visual Experience in a Pompeian Domestic Space

*Daniilo Marco Campanaro, Giacomo Landeschi, Dept. for Archaeology and Ancient Studies and LU Humanities Lab, Lund University*

This project investigates visual perception in Roman houses and how perception was manipulated through architectural design, movement and lighting to convey specific messages about the owners' social identity and status. The examined case study focuses on the House of the Greek Epigrams in Pompeii. In this study, an innovative approach is presented, combining several computational methods, including Virtual Reality-based Eye-Tracking and 3D Geographical Information Systems. The goal is to provide new insights into space perception within Roman domestic environments.



## Inside

*Tim Bishop, artist, Hedvig Becke, singer*

Artist Tim Bishop and singer Hedvig Becke collaborated on an artistic project resulting in the sound and VR180 installation *Inside*, presented in the Lab's anechoic chamber. Based on interviews with Obsessive Compulsive Disorder (OCD) sufferers, *Inside* aimed to present OCD as a subjective, complex and nuanced disorder. The installation received positive feedback expressing a strong desire for the artists to show the work to more people who could benefit from the experience. From visitor comments it was clear that the work succeeded in meaningfully presenting OCD from the perspective of sufferers to people without OCD. As an art project, it created possibilities for Bishop and Becke to explore the use of VR visuals with spatial sound in a physically secluded space, and the anechoic chamber added to the experiential effect of the perspective they hoped to achieve.





## Vadstena monastery church

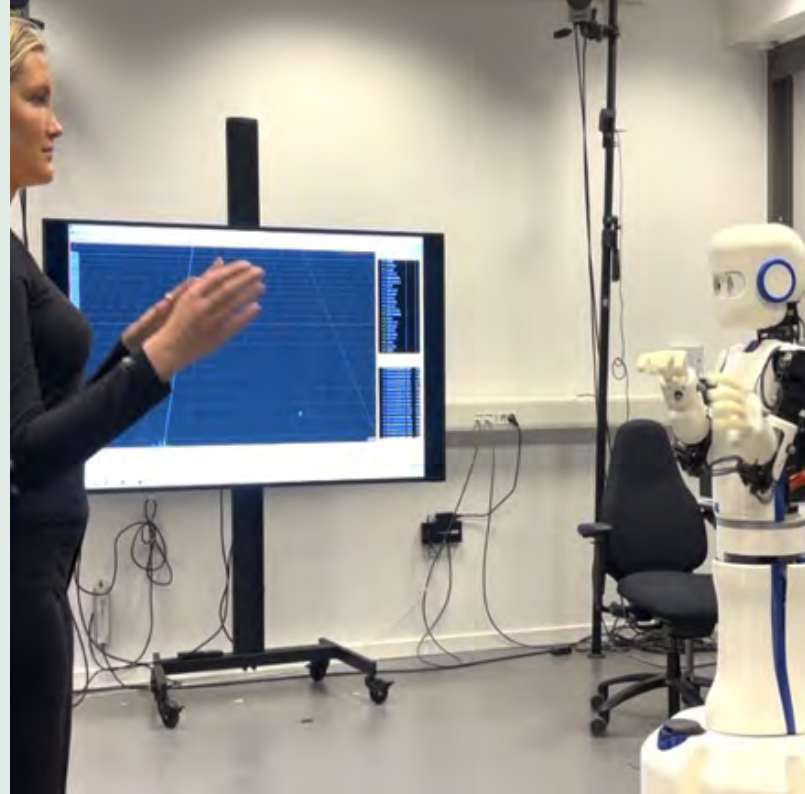
*Stefan Lindgren, LU Humanities Lab, Lund University, Eva Lindqvist Sandgren, Uppsala University, Karin Lagergren, Linneaus University, Hanna Autio, Lund University, Mathias Barbagallo, Lund University, Carolina Ask, private contractor, Matteo Rossi, Lund University,*

The continuing project of reconstructing the monastery church at Vadstena, a collaboration with Uppsala University and the Department of Technical Geology at LU, among others, was completed in 2022. By 3D scanning the church, this project has been able to reconstruct the monastery church in VR. The reconstruction has involved developing methods for combining 3D models and sound, yielding 360 auralisation videos illustrating what could be seen and heard from different parts of the church. This is particularly interesting as monks, nuns and visiting pilgrims did not have access to the same parts of the church.

## Social robots

*Valentina Fantasia, Dept. of Philosophy, Lund University*

Humans spontaneously synchronise their body movements when interacting with others, and this synching-in supports their relational experience. Is this also the case with interactions involving other social agents, e.g. social robots? This project aims to advance the understanding of human-robot interactions by exploring how humans adapt their movements to those of the robot to sustain interpersonal synchrony, and how this may influence the human's perception of the robot. By using advanced real-time tracking and analysis techniques, the study provided evidence that interpersonal synchrony is higher in interactions between humans compared to human-robot. The implications from these findings will improve existing models of human-robot interaction, helping to create more natural, intuitive interactions that enhance the effectiveness of social robots in various settings.





## Gender-fair language in French

*Julia Tibblin, Centre for Languages and literature, Lund University*

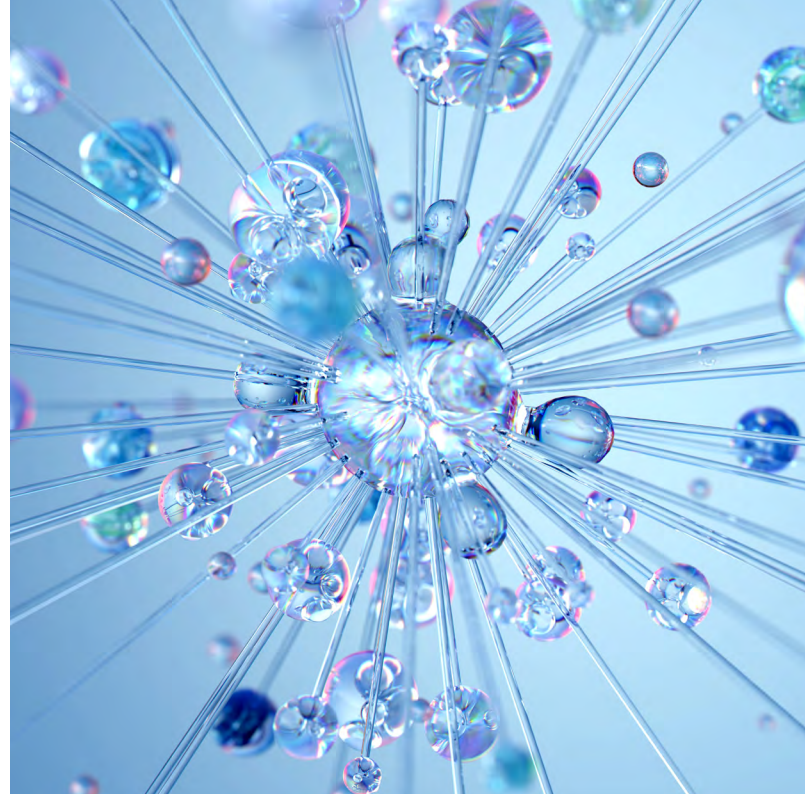
In her PhD project, Julia Tibblin studies gender-fair language in French (*écriture inclusive*), that is, ways of including both masculine and feminine forms to make language more inclusive, as opposed to using the masculine as the generic or neutral form. Gender-fair forms is a controversial topic in France. Tibblin's previous studies have explored how gender-fair language is viewed by the public and how specific forms are interpreted by readers. In a new study, Tibblin uses eye-tracking to explore potential effects on comprehension as measured by reading times and reading patterns. She focuses on two different gender-fair forms of nouns, the so-called complete double forms (*joggeuses et joggeurs*, both feminine and masculine forms of the noun included) and the contracted double form (*joggeur-euses* in which both masculine and feminine endings are included on one single noun). In addition to the double forms, the experiment includes the traditional masculine as neutral (i.e. *joggeurs*). Each form is compared to control items that have been matched for length and typography. Preliminary analyses indicate that only the contracted double form differs in reading time from its matched controls, which implies that it is more difficult to process.



## Automated information extraction

*Sonja Aits, Rafsan Ahmed and Salma Kazemi Rashed, Faculty of Medicine, Lund University, Peter Berck, LU Humanities Lab, Lund University*

The literature in the life sciences has grown to over 40 million articles making it impossible to process for humans. Yet, precisely because of how vast this body of work is, consolidating knowledge dispersed across the articles holds the potential to yield particularly valuable insights. These insights could inform future research endeavors but also facilitate the development of new medical treatments. In the project Mining the life science literature, researchers draw on language technology to create a so-called knowledge graph of domain-specific entities (e.g. proteins) related to cell death. The project uses named entity recognition (NER) and relation extraction methods. To handle the large amounts of data, the models are trained on HPCs at the National Academic Infrastructure for Supercomputing in Sweden (NAISS) using the Berzelius super cluster. The project's knowledge graph will be used to enhance and evaluate insights gained from microscopic image analysis. Moreover, importantly, the project will make its large-scale biomedical natural language processing (NLP) tools accessible to other researchers in other domains.





## **Cat–human communication: vocal, visual and tactile signals**

*Susanne Schötz, Joost van de Weijer, Elin Hirsch, Lund University*

Little is known about how cats, one of our most popular pets, and humans communicate with each other. Yet, well-functioning communication is crucial for a meaningful relationship with our pets to avoid euthanasia or abandonment due to unwanted behaviours. The project will record and analyse vocal, visual and tactile signals in cat–human interactions and relate them to measures of welfare. The goal is to improve cat–human communication by developing an online guide with descriptions and examples.

## Incidental reactivation of trauma-analogue memory

*Linn Petersdotter & Lindsey Miller, Dep. of Psychology, Lund University*

This study investigates incidental responses to trauma-analogue material and fear overgeneralization. It uses two components of the BioPac: the galvanic skin response (which measures sweat reactions) and the heart rate variation (HRV). Participants will first watch negative and neutral video scenes. They will then do an emotional Stroop task featuring video-relevant or -irrelevant distractors. Through both tasks the BioPac will be measuring the participant's physiological response.





## L2 learners' processing of Swedish placement verbs

Annika Andersson, Frida Blomberg, Linneaus University, Marianne Gullberg, Centre for Languages and Literature, Lund University

This project explored whether the meaning of verbs in your first language affects how you process verb meaning in a new language. It focused on how English and German speakers learning Swedish process Swedish verbs for placement: *sätta* (set), *ställa* (stand), and *lägga* (lay). English has a general verb for placement, *put*, while German has verbs similar to Swedish: *stellen* (set/stand) and *legen* (lay). The project used EEG/ERP to probe online processing, and also asked participants to explicitly rate how well verb use matched a photo of the event (e.g. a photo of a candle being set vertically paired with the sentence *She takes the candle and lays it on the table*). Results showed that learners whose first language verbs were closer to Swedish, like the Germans, processed and judged Swedish verbs more like Swedish speakers.





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