MEi:CogSci Projects for Specialisation

Effective March 2022

Projects at the Comenius University in Bratislava

Project	*Description*	*Covid-19 Information*	*Required Qualifications*	*Places*	*Level*
Grounding abstractness Igor Farkas, prof. Dept. of Applied Informatics, Faculty of Math, Physics and Informatics, Comenius Uni. web	Abstract concepts lie at the core of human cognition, providing it with an immense potential for thinking. Yet, understanding abstractness remains an open challenge in cognitive science, despite an outburst of recent papers published on the topic. The goal of the project is to propose a conceptual framework for concrete and abstract concepts that could be implemented in a neural network and simulated in a smaller domain.		An ideal candidate would have solid knowledge in linguistics and experience with machine learning (neural networks) and/or programming. Purely theoretical project is also possible.	1	S-I
Connectionist modeling in cognitive robotics Igor Farkas, prof. Dept. of Applied Informatics, Faculty of Math, Physics and Informatics, Comenius Uni. web	The goal will be to implement and test a neural network model of a chosen agent's component in a simulated or physical environment (NICO robot). The robot is supposed to learn a concrete task. Various foci are possible: intuitive physics, i.e. understanding causality in the physical world, intuitive psychology (theory of mind), i.e. understanding the other's goals, spatial cognition, etc. Concrete focus of the project will be negotiated.		At least basic programming skills (e.g. Python). Experience with artificial neural networks is an advantage.	1	S-I

Project	*Description*	*Covid-19 Information*	*Required Qualifications*	*Places*	*Level*
Towards humanizing human-robot interaction Igor Farkas, prof. Dept. of Applied Informatics, Faculty of Math, Physics and Informatics, Comenius Uni. web	The project can be for two students. Successful HRI in the future will be facilitated if certain expectations about interacting robots are met by the humans. The purpose of the theoretical part of the project is to investigate pros and cons of humanizing robots and analyze (some of) them on the level of design features (be referring to an existing literature). The computational part will be based on implementing and testing a selected aspect of humanized HRI.		The student doing the implementation part should have a programming experience (Python preferred) and experience with artificial neural networks is an advantage.	2	S-I
Computational psychiatry Martin Takac, assoc. prof. Dept. of Applied Informatics, Faculty of Math, Physics and Informatics, CUB web	Project for two students: One student gathers the relevant neuroscientific literature about altered states of consciousness and proposes a formal theory/model of the functional changes in an altered mind (e.g. based on entropic brain theory of Carhart-Harris, 2014). The other student co-designs and implements the computational model, runs and analyses its simulations.		The student doing the implementation part should have a previous experience in programming (in any language).	2	S-I
Social multi-agent simulation Martin Takac, assoc. prof. Dept. of Applied Informatics, Faculty of Math, Physics and Informatics, CUB web	The student will create a computational model of a social phenomenon of their choice (e.g. belief spreading, covid spreading in a population, etc.). The work includes reviewing the relevant theories in literature, designing and implementing a computational model (in Netlogo), running the simulations and interpreting the results.		Previous programming experience (in any language) on a moderate level required, so that the student is able to formalize the ideas into a code (Netlogo is easy to learn).	1	S-I
Mindfulness meditation, electroencephalography and brain stimulation Barbora Cimrová, PhD. Dept of Applied Informatics, Faculty of Math, Physics and Informatics, Comenius Uni. web	Mindfulness meditation (MM) is a well-known practice with a positive impact on well-being, cognitive functions (attention, working memory, executive functions), immunity, and other aspects of practitioners' life. The effects of MM include structural and functional changes of the brain. The goal of the project is to make a theoretical overview of the state-of-the-art research on mindfulness meditation and potential combination of this method with brain electrical stimulation; to design and eventually perform an experiment regarding this topic.		Experience with an EEG is an advantage.	1	S-I

Project	*Description*	*Covid-19 Information*	*Required Qualifications*	*Places*	*Level*
Human-robot interaction in virtual reality Kristína Malinovská, PhD. Dept of Applied Informatics, Faculty of Math, Physics and Informatics, Comenius Uni. web	HRI becomes one of the most popular interdisciplnary topics highly related to cognitive science. The domain of cognitive robotics studies and offers natural ways of building humanlike robots in the way they will understand and alignwith their human users. However, such robotic platforms are not in abundance and often trained using their simulated counterparts. This project is an assignment spanning from dense literature review up to experimental design and/or programming of the HRI-VR experiments.		This project is a good opportunity for joint work. One student should have a background in psychology, or linguistics, and the other one experience with machine learning and/or programming.	1	S-I
Language games Kristína Malinovská, PhD. Dept of Applied Informatics, Faculty of Math, Physics and Informatics, Comenius Uni. web	The so called language games are a very powerful tool of studying emergence of communication and grounding of meaning. Stemming from the game theory, they can be used in a computer simulation with agents as well as for behavioral experiments with human subjects. This yet not well explored field in cognitive science requires further attention in many respects. This project is an assignment spanning from dense literature review up to experimental design and/or programming of experiments.		This project is a good opportunity for joint work. One student should have a background in psychology, or linguistics, and the other one experience with machine learning and/or programming.	1	S-I
Biologically plausible learning in neural networks Kristína Malinovská, PhD. Dept of Applied Informatics, Faculty of Math, Physics and Informatics, Comenius Uni. web	The deep neural networks have become immensely popular in last 10 years. Despite their rapid development and super-human performance, they are still many research prospects to be studied in this area including the algorithms used for training the networks. Usually deep networks are trained using standard error backpropagation, a method developed in 1980's along with the multilayer perceptron. However powerful, the BP has been shown to be biologically implausible and new algorithms have been proposed and are still being developed. This project is an assignment spanning from dense literature review up to the experimental work with existing novel algorithms and/or being a part in proposing new ones.		Mathematics and programming skills required at least on a basic level. Experience with artificial neural networks is an advantage.	1-2	S-I

Project	*Description*	*Covid-19 Information*	*Required Qualifications*	*Places*	*Level*
Few-shot learning and prototype theory of categorization Kristína Malinovská, PhD. Dept of Applied Informatics, Faculty of Math, Physics and Informatics, Comenius Uni. web	The few-shot learning approach in artificial neural networks has recently become a popular way to address the problem of large labeled dataset requirements of traditional deep architectures. Simply said, in this paradigm we rather endow the network with some learning and generalization abilities than train it to generalize over a particular kind of data. The prototype theory of Eleanor Rosch and others have been proposed quite a long time ago, yet currently it can find a lot of use in so popular deep learning. This project is an assignment spanning from dense literature review up to the experimental work with existing models and/or being a part in proposing new ones.		Mathematics and programming skills required at least on a basic level. Experience with artificial neural networks is an advantage.	1	S-I
Cognitive and brain mechanisms of semantic memory retrieval Martin Marko, PhD Dept of Applied Informatics, FMPI / Dept of Behavioral Neuroscience, INPP web	A challenge in the research on human cognition is to understand the mechanisms enabling fluid retrieval of semantic knowledge that is suitable for current contexts and situational demands. This project is aimed to investigate these (domain-general and domain-specific) mechanisms and processes that underpin semantic memory retrieval in healthy participants, using experimental manipulation of relevant cognitive or neurobiological systems. Such manipulations may involve either various forms of cognitive load and interference or (optionally) non-invasive brain stimulation (tES), depending on the availability of the required device(s) and the currently ongoing experiments in our lab at that time. Note: this is an empirical assignment that includes duties associated with data collection. Thus, students taking this project will be expected to recruit participants, administer experimental sessions (on their own or in collaboration with each other), and analyze the empirical data (under the supervision).		The ability to manage and execute experimental sessions and assess the findings. For this, experience in empirical/ experimental research and quantitative methodology is an advantage.	1-2	S-I
Brain simulation, sensory gating and cognitive inhibition Igor Riečanský, PhD Institute of Normal and Pathological Physiology, Slovak Academy of Sciences, Bratislava web	Cognitive inhibition is essential for goal-directed behavior. This project will investigate the possibilities of modulating brain inhibitory processes using non-invasive transcranial direct current brain stimulation. An experimental approach will be adopted using behavioral and electrophysiological methods (EEG, EMG).		Experience in experimental research and quantitative methodology is an advantage.	1-2	S-I

Project	*Description*	*Covid-19 Information*	*Required Qualifications*	*Places*	*Level*
Barriers of people's climate change beliefs and pro-environmental behaviors Jakub Šrol, PhD. Institute of Experimental Psychology, Slovak Academy of Sciences web	Despite the fact that people around the world voice their concern over negative consequences of climate change, their actual engagement in pro-environmental behavior is rather low. Researchers uncovered many barriers that people report as reasons for not engaging more with environmental issues, spanning from the lack of understanding of climate change, resulting from cognitive biases that increase psychological distance from the issue, or barriers driven by feelings of helplessness and guilt. The aim of the project is to gain further insight into barriers of people's climate change beliefs and pro-environmental behaviors, and to find ways to improve people's engagement with this issue.		Background in the psychology is an advantage	1	S-I
Interventions to reduce people's susceptibility to fake news and conspiracy theories Jakub Šrol, PhD. Institute of Experimental Psychology, Slovak Academy of Sciences web	Media, politicians, and scientists voice their concern over large proportions of people being susceptible to fake news and conspiracy theories. Although some debiasing methods, such as inoculation by counterarguments, have already proved effective in this regard, they all have their limits – e.g. successful inoculation has to occur before the exposure to conspiracy theory content. The aim of the project is to create and test the effectiveness of various new interventions – such as increasing information and scientific literacy or priming critical thinking about social media content – in reducing the belief in various popular conspiracy theories and trust in fake news.		Background in the psychology is an advantage	1	S-I
Studying effects of virtual reality training on motor rehabilitation Roman Rosipal, PhD Institute of Measurement Science, Slovak Academy of Sciences web & web	Technological advancements based on virtual reality (VR) offer various research and medical treatment challenges. Being part of the ReHaB project, the study focuses on hemiparetic patients after stroke. We test the hypothesis of whether experience with training in VR (in combination with motor-imagery-based brain-computer interface) will enhance narrow-band scalp-recorded EEG oscillations. Projects will carry a vital practical and analytical component connected to real EEG data recorded during the VR-based experiments.		Systematic work, basic principles of statistical analysis and testing, programming in MATLAB is an advantage.	1-2	S-I
Nature of human consciousness Silvia Galikova, prof. Institute of Philosophy, Slovak Academy of Sciences web	Main objective of the project is to reconsider novel experimental and theoretical models, theories on the status and function of conscious experience.		Background in the JDM is an advantage	1	S-I

Project	*Description*	*Covid-19 Information*	*Required Qualifications*	*Places*	*Level*
Development of beliefs by artificially modulated states of mind Tomas Gal, PhD Dept of Applied Informatics, Faculty of Math, Physics and Informatics, Comenius Uni. web	Research into altered states of mind, done by various methods, like dance, meditation or stress.		Background is psychology is an advantage	1	S-I
AI biases Tomas Gal, PhD Dept of Applied Informatics, Faculty of Math, Physics and Informatics, Comenius Uni. web	Human cognitive biases are mostly considered as a burden from pre-civilized times. They help us, however, to solve everyday practice, routinely. The aim of this research projects focuses on two questions (1) whether the AI should by stripped from all human-like biases and (2) if not, what kind of biases should be mimicked. Practical output of this research will be a conceptual model of economically profitable ethical AI.		Background in psychology or philosophy is an advantage.	1-2	S-I
Human being and information technology Emil Visnovsky, prof. Faculty of Philosophy, Comenius University web	Project will focus on the analysis and functions of information technology and its varieties in human life from a philosophical point of view based on contemporary cognitive science and AI.			1-2	S-I
Nature of human consciousness Silvia Tomaskova, prof. University of Constantine the Philosopher in Nitra, Department of Philosophy, Nitra web	Main objective of the project is to reconsider novel experimental and theoretical models, theories on the status and function of conscious experience. Research concentrates on the inquiry into the nature of conscious/unconscious distinction, reality of Self, impairments of consciousness, self-knowledge, explanation of subjective „inner life“.		Background in philosophy of mind is an advantage.	1	S-I

Projects at the Eötvös Loránd University

Project	*Description*	*Covid-19 Information*	*Required Qualifications*	*Places*	*Level*
Neurocognitive mechanisms of speech perception, reading, music Ferenc Honbolygó ELTE, Department of Cognitive Psychology & Research Group of Neurocognitive Development, Hungarian Academy Sciences web	Investigating the neurocognitive mechanisms of speech perception, reading, music, implicit learning and cognitive control in adults, children and infants, with a special focus on clinical and developmental aspects, using the latest techniques of brain imaging (EEG, fMRI).		Please, contact the project leader about the details (e.g. available places for students may be more than 2 for certain projects, available master thesis oportunities are also depend on the project).	1-2	S-I, MA
The role of oscillations in perceptual processes using EEG, Spatial cognition, Time perception Zoltán Nádasdy ELTE, Department of Cognitive Psychology web	• The role of oscillations in visual perception (an EEG study) • Visual consciousness • Human development of spatial cognition and its relationship to Theory of Mind • Time perception and cognitive representation of time • The neuronal phase-code		Please, contact the project leader about the details (e.g. available places for students may be more than 2 for certain projects, available master thesis oportunities are also depend on the project).	1-2	S-I, MA
Comparative analysis of social cognition in dogs and humans: Family dog project Adam Miklosi ELTE, Department of Ethology web	• Comparative analysis of social cognition in dogs and humans: Interdisciplinary approach • Studying cognitive aging in dogs (researcher: Eniko Kubinyi) • Interspecific attachment in cats to humans (researcher: Marta Gácsi) • Bioacoustic analysis of vocal communicative signals in dogs (researcher: Tamás Faragó)		Please, contact the project leader about the details (e.g. available places for students may be more than 2 for certain projects, available master thesis oportunities are also depend on the project).	1-2	S-I, MA
Neglect syndrome in dogs Anna Kiss MTA TTK, Hungarian Academy Sciences web	Description of the neglect syndrome in dogs (using the side preference phenomenon known from cognitive tests as a starting point).		Please, contact the project leader about the details (e.g. available places for students may be more than 2 for certain projects, available master thesis oportunities are also depend on the project).	1-2	S-I, MA

Project	*Description*	*Covid-19 Information*	*Required Qualifications*	*Places*	*Level*
Social learning and social cognition in infants Ildiko Kiraly ELTE, Department of Cognitive Psychology web	Behavioral and eye-tracking studies in the field of Cognitive development.		Please, contact the project leader about the details (e.g. available places for students may be more than 2 for certain projects, available master thesis oportunities are also depend on the project).	1-2	S-I, MA
Cross-cultural research on The Evolution of Laws Ildiko Kiraly ELTE, Department of Cognitive Psychology web	We recently found that the justice intuitions American and Indian MTurk participants have with respect to a given offense (e.g., theft, fraud, sexual offense, manslaughter, etc.) positively correlate with the actual legal punishments provided for that offense by actual laws sampled from actual criminal codes. This project seeks to replicate and extend our recent findings, but now with participants from a large sample of very diverse national cultures.		Please, contact the project leader about the details (e.g. available places for students may be more than 2 for certain projects, available master thesis oportunities are also depend on the project).	1-2	S-I, MA
Infant directed speech in dogs Anna Gergely ELTE, Department of Ethology web	Studies include dog human communication, mutual reactions to emotional behavior, cognitive aging in dogs, etc.		Please, contact the project leader about the details (e.g. available places for students may be more than 2 for certain projects, available master thesis oportunities are also depend on the project).	1-2	S-I, MA
Numerical cognition Attila Krajcsi ELTE, Department of Cognitive Psychology web	• Elementary bases of number understanding • Development of number understanding • Methodological details of reaction time analysis		Please, contact the project leader about the details (e.g. available places for students may be more than 2 for certain projects, available master thesis oportunities are also depend on the project).	1-2	S-I, MA

Project	*Description*	*Covid-19 Information*	*Required Qualifications*	*Places*	*Level*
Recommended data analysis and statistical analysis Attila Krajcsi ELTE, Department of Cognitive Psychology web	• Suggesting analysis paths for automatic data analysis software • Forming more informative data analysis output • Python coding of automatic data analysis software (www.cogstat.org)		Please, contact the project leader about the details (e.g. available places for students may be more than 2 for certain projects, available master thesis oportunities are also depend on the project).	1-2	S-I, MA
Meta-science / Open science Balázs Aczél ELTE, Department of Affective Psychology web	Various topics in meta-science, researching how research is done and how to improve it. Open science, transparency, and research integrity-related projects.		Please, contact the project leader about the details (e.g. available places for students may be more than 2 for certain projects, available master thesis oportunities are also depend on the project).	1-2	S-I, MA
Executive functions in healthy, functioning & specific conditions Alexander Logemann ELTE, Department of Affective Psychology web	Elucidating the mechanism of executive functions (predominantly attention & inhibitory control).		Please, contact the project leader about the details (e.g. available places for students may be more than 2 for certain projects, available master thesis oportunities are also depend on the project).	1-2	S-I, MA
Sleep & Cognition Peter Simor ELTE, Department of Affective Psychology web	Studies investigate the mechanisms and processes of sleep and dreaming in healthy and pathological conditions.		Please, contact the project leader about the details (e.g. available places for students may be more than 2 for certain projects, available master thesis oportunities are also depend on the project).	1-2	S-I, MA

Project	*Description*	*Covid-19 Information*	*Required Qualifications*	*Places*	*Level*
Cognitive abilities Lab Kristof Kovacs ELTE, Department of School Psychology web	Individual differences in cognitive abilities.		Please, contact the project leader about the details (e.g. available places for students may be more than 2 for certain projects, available master thesis oportunities are also depend on the project).	1-2	S-I, MA
Cognitive vs. emotional flexibility Renáta Cserjési ELTE, Department of Affective Psychology web	• Measuring and comparing emotional flexibility with cognitive flexibility in healthy and sub – and clinical populations • Improving emotional flexibility		Please, contact the project leader about the details (e.g. available places for students may be more than 2 for certain projects, available master thesis oportunities are also depend on the project).	1-2	S-I, MA
Human Interactions Katalin Varga ELTE, Department of Affective Psychology web	Behavioural, emotional, phenomenological and psycho-physiological changes in participants of interpersonal situations.		Please, contact the project leader about the details (e.g. available places for students may be more than 2 for certain projects, available master thesis oportunities are also depend on the project).	1-2	S-I, MA
Human Adaptation Anna Veress-Szekely ELTE, Department of Affective Psychology web	Study resilience using an interdisciplinary research approach, implementing multiple levels of analysis perspectives based on genetic, developmental, physiological, demographic, cultural, economic and social variables.		Please, contact the project leader about the details (e.g. available places for students may be more than 2 for certain projects, available master thesis oportunities are also depend on the project).	1-2	S-I, MA
Sustainable behaviour Barnabás Imre Szászi ELTE, Department of Affective Psychology web	We conduct research in the field of science of sustainable behaviour change in several domains such as health, education, sustainability, and financial behaviour. We also work on projects related to the perception of economic inequality and poverty.		Please, contact the project leader about the details (e.g. available places for students may be more than 2 for certain projects, available master thesis oportunities are also depend on the project).	1-2	S-I, MA

Project	*Description*	*Covid-19 Information*	*Required Qualifications*	*Places*	*Level*
Social cognition Bálint Forgács ELTE, Department of Cognitive Psychology web	Social cognition, mentalization, and language acquisition in infancy, investigated using EEG.		Please, contact the project leader about the details (e.g. available places for students may be more than 2 for certain projects, available master thesis oportunities are also depend on the project).	1-2	S-I, MA
Language processing Bálint Forgács ELTE, Department of Cognitive Psychology web	Figurative language processing investigated with EEG.		Please, contact the project leader about the details (e.g. available places for students may be more than 2 for certain projects, available master thesis oportunities are also depend on the project).	1-2	S-I, MA

Projects at the University of Ljubljana

Project	*Description*	*Covid-19 Information*	*Required Qualifications*	*Places*	*Level*
Cognitive neuroscience of working memory and cognitive control Anka Slana Ozimič, assist. prof., Nina Purg, PhD Department of Psychology, Mind and Brain Lab email: nina.purg@ff.uni-lj.si web: http://psy.ff.uni-lj.si/mblab/en	Multimodal study of working memory and cognitive control employing EEG, fMRI, eyetracking, behavioral studies. Possible topics: Visual and spatial working memory; Cognition-emotion interaction; Working memory and cognitive control. See Mind and Brain Lab pages for other research opportunities: http://psy.ff.uni-lj.si/mblab/en/research. Supervisor: prof. Grega Repovš	Remote collaboration is also possible.	Solid foundations in experimental design and statistics are required. Prior experience with EEG, fMRI or eye-tracker is beneficial as well as python, Matlab and R programming skills. Contact the responsible (contact person) and state your interests. If interested in carrying out your own research project propose a detailed research plan. Also state if interested in extending the research project into master's thesis.	1-2	S-I, MA
Brain connectivity studies Anka Slana Ozimič, assist. prof., Nina Purg, PhD Department of Psychology, Mind and Brain Lab email: nina.purg@ff.uni-lj.si web: http://psy.ff.uni-lj.si/mblab/en	The project involves data collection, development of tools for fMRI and EEG functional connectivity analyses and their application to existing and novel datasets. Supervisor: prof. Grega Repovš	Remote collaboration is also possible.	Intermediate to advance programming, analytical and statistical skills are required. Familiarity with Matlab, python and possibly Julia is desired. Contact the responsible (contact person) and state your interests. If interested in carrying out your own research project propose a detailed research plan. Also state if interested in extending the research project into master's thesis.	1-2	S-I, MA

Project	*Description*	*Covid-19 Information*	*Required Qualifications*	*Places*	*Level*
Studying cognition with EEG/TMS (EEG and TMS Lab) Zvezdan Pritošek, prof. Contact person: Tina Štukelj University Medical Centre Ljubljana, Department of Neurology, Laboratory for Cognitive Neuroscience email: tina.stukelj@mf.uni-lj.si web: http://kobz.si/en/LCN.php	Specific topics/projects are dependent upon ongoing projects in the lab during the exchange semester. Supervisor: prof. Zvezdan Pirtošek	Physical presence is needed.	Contact the responsible (contact person) and state your interests. If interested in carrying out your own research project propose a detailed research plan. Also state if interested in extending the research project into master's thesis.	1-2	S-I, MA
Neurological and neuropsychiatric disorders Zvezdan Pritošek, prof. Contact person: Tina Štukelj University Medical Centre Ljubljana, Department of Neurology, Laboratory for Cognitive Neuroscience email: tina.stukelj@mf.uni-lj.si web: http://kobz.si/en/LCN.php	Possible topics: Dementia, Parkinson's disease, Tourette's Syndrome, Depression, Schizophrenia. Specific topics/projects are dependent upon ongoing projects in the lab during the exchange semester. Supervisor: prof. Zvezdan Pirtošek	Address inquiries to the contact person.	Contact the responsible (contact person) and state your interests. If interested in carrying out your own research project propose a detailed research plan. Also state if interested in extending the research project into master's thesis.	1-2	S-I, MA
Predictors of deep brain stimulation outcome in movement disorders patients Dejan Georgiev, assist. prof. University Medical Centre Ljubljana, Department of Neurology, Laboratory for Clinical Neuroscience email: dejan.georgiev@kclj.si	We are collecting data for a study in which we are trying to determine electrophysiological (TMS and EEG) and imaging biomarkers (fMRI) of good outcome of DBS in patients with movement disorders.	Also possible in distance learning format (literature review).	TMS, EEG, fMRI skills recommended.	2	S-I, MA

Project	*Description*	*Covid-19 Information*	*Required Qualifications*	*Places*	*Level*
Aubert-Fleischl phenomenon, Bradykinesia, Time Perception and dopaminergic medication in Parkinson's disease Dejan Georgiev, assist. prof. University Medical Centre Ljubljana, Department of Neurology, Laboratory for Clinical Neuroscience email: dejan.georgiev@kclj.si	The Aubert-Fleischl phenomenon describes a condition where the perceived velocity of a moving stimulus differs depending on whether the subject is following the stimulus with the sensory organ or the sensory organ is at rest. This phenomenon relates to time perception and also possibly to the mechanisms of bradykinesia.	Also possible in distance learning format.	Technical skills recommended.	3	S-I, MA
Eye movement and cognitive abnormalities in patients with Parkinson's disease with and without heterozygous GBA1 mutation Dejan Georgiev, assist. prof. University Medical Centre Ljubljana, Department of Neurology, Laboratory for Clinical Neuroscience email: dejan.georgiev@kclj.si	It is supposed that patients with PD do not have specific eye movement disorders, although some recent findings pint towards the possibility of bradyhypokinesia of eye movements in these patients. Regarding GBA1-PD, we do not know if ocular movement disorders are present in them.	Also possible in distance learning format.	Statistical skills recommended.	3	S-I, MA
The role of diaphragmatic movements and cognition in breathing abnormalities in PD and other parkinsonisms Dejan Georgiev, assist. prof. University Medical Centre Ljubljana, Department of Neurology, Laboratory for Clinical Neuroscience email: dejan.georgiev@kclj.si	Neurodegenerative diseases, including Parkinson's disease (PB), are often associated with motor control disorders, including respiratory disorders. Unlike other motor problems such as resting tremor, rigidly elevated tone, bradykinesia, and postural instability, respiratory disorders are poorly understood, their frequency is underestimated, despite their importance for patients with PD and parkinsonisms.	Possible distance learning (literature review)	-	2	S-I, MA

Project	*Description*	*Covid-19 Information*	*Required Qualifications*	*Places*	*Level*
Electroencephalographic properties of clinical depression Jure Bon, M.D. Ph.D., assist. prof. Aleš Oblak, M.Sc. oblak.ales.93@gmail.com University Psychiatric Clinic Ljubljana	A long-term EEG project on the neurological properties of clinical depression. A combination of EEG and a behavioral task (n-back task) is used. Work is done both on the clinical population and healthy controls. To students interested in EEG analysis method, we can offer guidelines in analyzing event-related potentials (ERP) and neural time series analysis. Students are expected to assist with data acquisition. They must attend lab meetings (occasionally, they will be asked to present two recently published papers on the relevant topics).		No specific training required, although experience with conducting studies (e.g., delivering experiment instructions to participants) is preferred.	2	S-I
Studying Cognition with EEG and TMS in health and psychiatric disorders Jure Bon, assist. prof. University Psychiatric Clinic Ljubljana email: jure.bon@psih-klinika.si	Studying Cognition with EEG and TMS (TMS Lab) in health and psychiatric disorders (e.g, mood disorders, schisophrenia) Supervisors: assist. prof. Jure Bon.	Not possible online.	Contact the responsible (contact person) and state your interests.		
Language processing in healthy and brain-damaged populations Christina Manouilidou, assoc. prof. Faculty of Arts, Department of Comparative and General Linguistics email: christina.manouilidou@ff.uni-lj.si web	The general topic of the project falls in the areas of Psycholinguistics and Neurolinguistics. The research questions we will tackle are the following: what are the mechanisms of language processing? How do we recognize words? How do we process sentences? In what way is language processing compromised when the brain is affected? A special focus will be given on language degradation as a result of neurodegenerative diseases, such as various types of dementia, and on how language could be used as a diagnostic tool for dementia.		Introductory knowledge of linguistics, familiarity with linguistic terms, experience with experimental design and statistical analysis are a must. Familiarity with behavioral and/or electrophysiological and neuroimaging methodologies is desired. Contact the supervisor for specific topics.	1-2	S-I

Project	*Description*	*Covid-19 Information*	*Required Qualifications*	*Places*	*Level*
Factors of performance in cognitive tests for measuring executive functions Anja Podlesek, prof. Luka Komidar, assist. prof. Department of Psychology, Faculty of Arts email: anja.podlesek@ff.uni-lj.si	The goal of the research is to study how performance in cognitive tests measuring executive functions (updating, inhibition, switching, planning) and psychometric characteristics of these tests are related to different variables such as personality (conscientiousness, neuroticism), prior experiences (practice, experience with similar tasks, playing videogames), task characteristics (single vs. dual tasks; time limited vs. time unlimited tasks) and other situational factors (e.g. test situation, instructions, feedback). Variables of interest can be freely chosen by the student.	If students have access to cognitive and other types of tests (e.g., they use tests from open access test batteries), remote collaboration is possible.	Experience with experimental designs, knowledge in psychometrics and multivariate statistical analysis.	1-2	S-I (possibly MA)
Investigation of changes in cognitive test performance during cognitive training Anja Podlesek, prof. Department of Psychology, Faculty of Arts email: anja.podlesek@ff.uni-lj.si	E.g.: study of self-reported changes in strategies used, changes in eye movements or physiological measures.	If students have access to cognitive tests and plan to use self-report measures or specific behavioral measures which do not require the use of specific research equipment (e.g. eye-tracker), remote collaboration is possible.	Experience with experimental designs, knowledge in statistical analysis. In case of using eye-tracker or other physiological measures, prior experience is beneficial.	1-2	S-I (possibly MA)

Project	*Description*	*Covid-19 Information*	*Required Qualifications*	*Places*	*Level*
Development of an interactive cognitive training for the elderly Anja Podlesek, prof. Department of Psychology, Faculty of Arts email: anja.podlesek@ff.uni-lj.si *in collaboration with* Andrej Košir, prof. LUCAMI lab, Faculty of Electrical Engineering, web: https://www.lucami.org/en/	We would like to develop a multicomponent training of executive functions that older people will be able to carry out at home with help of smart technology.	Theoretical work and development of the training design is possible in the remote format. For design implementation, work in the LUCAMI lab is required.	-	1-2	S-I (possibly MA)
Sound symbolism in act Amanda Saksida, assist. prof. Institute for Maternal and Child Health - IRCCS "Burlo Garofolo" - Trieste email: amanda.saksida@burlo.trieste.it	Sound symbolism and sound iconicity in relation to synaesthesia affect how lexicons are built across languages. Despite differences in lexicalization (word length, borrowings, etc.), terminology is in essence affected by the same processes as general languages. The goal of the project is to verify whether domain-specific terminology is affected by the general sound iconicity (e.g. vowel selection for big and small objects, vowel preference for dark and bright colors, etc.), and whether it is possible, using the current state methods, to identify more selective and language-specific processes for specific terminological domains.	Remote collaboration possible.	Some background in natural language processing or language technologies is an advantage.	1-2	S-I
Ethnography of everyday experience Urban Kordeš, prof. Jaša Černe, M.Sc. Faculty of Education, Laboratory for Empirical Phenomenology email: jasa.cerne@pef-uni.lj.si web: http://observatory.pef.uni-lj.si	The project would include an in-depth ethnographic investigation of a certain phenomenon as it presents itself to people in their everyday life. Ethnography is here understood as empowering participants to become co-researchers and by the means of self-exploration keep track of different aspects (experiential, contextual, …) of the phenomenon in the ecologically valid way.		No background knowledge is required, but experience with qualitative research is valuable.	1-2	S-I & MA

Project	*Description*	*Covid-19 Information*	*Required Qualifications*	*Places*	*Level*
Contemplative phenomenology: meditation as a tool for investigating consciousness Urban Kordeš, prof. Jaša Černe, M.Sc. Faculty of Education, Laboratory for Empirical Phenomenology email: jasa.cerne@pef-uni.lj.si web: http://observatory.pef.uni-lj.si	More information on the general idea of the project can be found here: http://observatory.pef.uni-lj.si/sub5.html.		No background knowledge is required.	1-2	S-I & MA
Decision-Making Toma Strle, assist. prof. Faculty of Education, Center for Cognitive Science email: toma.strle@pef.uni-lj.si web: https://www.pef.uni-lj.si/1114.html	The student would explore one of the following aspects of decision-making: • Embodied, enactive and/or predictive processing accounts of decision-making. • Differences and similarities between decision-making in everyday life situations and the lab (alternatively, between hypothetical and real choice). • The role of self-understanding, metacognition, metacognitive feelings, etc. in decision-making.	Possible also in distance learning format.	Contact the supervisor, state your background and interest, and which subtopic you would be interested in. If motivated, other topics on decision-making may be agreed upon. In this case, students should send a brief — but specific — description of their project proposal.	1-2	S-I, MA
The experience of choice in everyday life Toma Strle, assist. prof. Faculty of Education, Center for Cognitive Science, Laboratory for Empirical Phenomenology email: toma.strle@pef.uni-lj.si web: https://www.pef.uni-lj.si/1114.html	The aim of the project is to investigate how people experience the process of decision-making and choice in everyday life.	Possible also in distance learning format (theoretical work).	Contact the supervisor and state your interests.	1-2	S-I, MA

Project	*Description*	*Covid-19 Information*	*Required Qualifications*	*Places*	*Level*
A systematic review of first-person research on decision making Toma Strle, assist. prof. Faculty of Education, Center for Cognitive Science, Laboratory for Empirical Phenomenology email: toma.strle@pef.uni-lj.si web: https://www.pef.uni-lj.si/1114.html	The goal of the project would be to review firstperson studies on decision-making stemming from the phenomenological tradition, classify them, and synthesise findings of the included studies. Optionally (dependent on the scope of the project), the student would compare/discuss findings of the systematic review with/in light of third-person research on decision-making, or decided-upon aspects of it.	Possible also in distance learning format (theoretical work).	-	1-2	S-I, MA
Looping minds: Exploring Possible Ways in Which Cognitive Science Might Exert Influence on Its Findings Toma Strle, assist. prof. Faculty of Education, Center for Cognitive Science email: toma.strle@pef.uni-lj.si web: https://www.pef.uni-lj.si/1114.html	Contemporary cognitive science is creating new ways of understanding of what it means to be a human mind/being. As such, it not only has the potential to change how people understand themselves but also affect what it finds out about its very subject matter – the human mind. The specific research question would be specified in more detail according to students' interest and background. Some examples of such looping effects: The interplay between mechanistic views of the human mind and exertion of self-control or other agency-related faculties; The interaction between explicit choice environment modification (e.g., nudges; algorithmic-supported choice), attitudes towards those modifications, and choice.	Possible also in distance learning format (theoretical work).	Contact the supervisor, state your interest and background, and how you would approach the topic	1	S-I, MA
Science, values and society Olga Markič, prof. Faculty of Arts, Department of Philosophy email: olga.markic@ff.uni-lj.si web	The aim of the project is to explore the interrelationship between science and values.	Possible on-line.	Contact the supervisor, state your interest and background, and how you would approach the topic.	1-2	S-I

Project	*Description*	*Covid-19 Information*	*Required Qualifications*	*Places*	*Level*
Cognitive science in the world of sport Olga Markič, prof. Faculty of Arts, Department of Philosophy email: olga.markic@ff.uni-lj.si web	The aim of the project is to explore the relations between cognitive science and sport. Specific topics may include: Cognitive enhancement in sport and the question of doping; Embodied cognition and sport; Consciousness and sporting skills.	Possible on-line.	Contact the supervisor, state your interest and background, and how you would approach the topic.	1-2	S-I
Francisco Varela's work on life, mind, and consciousness Sebastjan Vörös, assist. prof. Faculty of Arts, Department of Philosophy email: sebastjan.voros@ff.uni-lj.si	The aim of the project is to explore Francisco Varela's work on life, mind, and consciousness.	Please contact project supervisor.	Contact the supervisor, state your interest and background.	1-2	S-I
Explainable Machine Learning **Explainable Machine Problem-Solving** Ivan Bratko, prof. Faculty of Computer and Information Science, Artificial Intelligence Lab email: bratko@fri.uni-lj.si web: https://fri.uni-lj.si/en/laboratory/lui	Explainable AI has recently become a very popular topic of AI research and applications. The reason is that some of the most powerful AI methods are very hard to be understood by humans. So they behave just like black boxes and their results hard to interpret. The most famous example of this are deep artificial neural networks. In these projects, ideas of turning these methods into “transparent boxes” with interpretable results will be explored.	Possible also in distance format.	Basics of AI.	3	S-I

Project	*Description*	*Covid-19 Information*	*Required Qualifications*	*Places*	*Level*
Machine learning & natural language processing Marko Robnik Šikonja, prof. Faculty of Computer and Information Science, Laboratory for Cognitive Modeling email: marko.robniksikonja@fri.uni-lj.si web	Topics: • Machine learning: injection of knowledge into deep neural networks, cognitive limitations, explanation of prediction models etc. • Natural language processing: explanation of deep neural networks for text processing, design and implementation of language understanding evaluation tasks, word sense induction with deep neural networks, concept drift through time, political stance in corpora, text summarization, etc.	Possible also in distance format.	Contact the supervisor and state your interest.	1-2	S-I
Measurement of neural correlates of motor errors in movement learning Jan Babič, prof. Jožef Stefan Institute, Department of Automatics, Biocybernetics, and Robotics email: jan.babic@ijs.si web	With the help of EEG measurement of brain activity, we want to determine the connection between neural correlates and specific errors during movement performance.		Good programming knowledge and/or experience with EEG measurements and analysis is required.	1-2	S-I, MA
Other projects Anka Slana Ozimič Various laboratories and departments email: anka.slanaozimic@ff.uni-lj.si	If you do not find a topic of your interest among the projects offered, please contact us about more possibilities. We are also connected with experts from the other fields of research (e.g., gait and cognition, psychedelics, music perception and cognition, cognitive modeling, natural language processing, user experience, virtual reality, etc.).		Contact the responsible (contact person) and state your interests.	N/A	S-I, MA

Projects at the University of Vienna

Project	*Description*	*Covid-19 Information*	*Required Qualifications*	*Places*	*Level*
Innovation, organization(-al cognition), design, and Enabling Spaces Univ. Prof. Dr. Markus Peschl Cognitive Science research Platform & Dept. of Philosophy website	Our guiding question concerns the topic of "how does novelty come into the world?". Projects are offered in the fields of innovation (theoretical as well as applied projects; on an individual/cognitive and/or on a collective/ organizational level), creativity, design, organizational design, cognitive organizations, knowledge creation, as well as studying and developing concepts how space enables and supports innovation- and knowledge work (e.g., in the sense of the extended/enacted cognition approach), and how such spaces can be designed. Projects range from (but are not limited to) theoretical foundations (cognitive, epistemological, organizational, systems science, etc.), educational issues, such as acquiring innovation skills and mindsets, organizational contexts, to the design of Enabling Spaces, such as office spaces or learning environments. Project work in small groups/teams is welcome. Also have a look at our Research Group: Organizing Cognition in Knowing Organizations (OCKO): https://ocko.univie.ac.at/	Both online and in-person projects.	Interest and some experience in innovation, design, architecture, openness, and creativity	2-3	IR II, S-I, MA
Making different tools from the same material in Goffin's cockatoos Alice Auersperg Messerli Research Institute, Comparative Cognition Unit/ Goffin Lab website	Goffin's cockatoos have the capacity to make and use tools. In ordert o determine abilitiey to plan the function of a tool during manufacture, we will test if they can use the same material to make up to three tools for completely different purposes.		BA, experiments in handling animals, preferably experience in behavioural experiments	1	MA

Project	*Description*	*Covid-19 Information*	*Required Qualifications*	*Places*	*Level*
Composite tool manufacture in Goffin's cockatoos Alice Auersperg Messerli Research Institute, Comparative Cognition Unit/ Goffin Lab website	Composite tool use is an important aspect of human technical evolution. Goffin's cockatoos have the capacity to make and use tools and they are stacking objects during object play. Here we will test if they can purposely create a funtional tool by adding several separate components.		BA, experiments in handling animals, preferably experience in behavioural experiments	1	MA

Art history and empirical methods

Dr. Luise Reitstätter
Department of Art History/Laboratory for Cognitive Research in Art History (CReA)
web

The aim of the Laboratory for Cognitive Research in Art History (CReA) is to expand art historical knowledge through the use of empirical and experimental methods. The laboratory's projects deal with traditional art historical questions about artworks and their perception as well as transdisciplinary issues of empirical aesthetics, visual culture and museology. Classical methods of art history are combined with digital humanities and social science approaches – from discourse analysis to database construction, from online questionnaires to open interviews and mapping. Research into eye movements, investigated during the beholding of art with remote and mobile eye trackers, is an area of special interest.

Current or upcoming projects:

Art User/Screen Viewer

Zoya Dare, PhD project

This research focuses on the aesthetic experience on the smartphone. Two studies will be conducted starting in October 2021, one on a remote eye tracker and another on a smartphone device.

Seeing history

Judith Herunter, MA thesis

An eye tracking study on the perception of narrative lines in painting, to be conducted with approx. 80 participants in autumn 2021.

Art Perception in a Museum Environment

Anna Miscenà, Carola Korhummel, Zoya Dare, PhD projects

The study will analyze different aspects of the aesthetic experience of art in a museum environment. Quantitative data will be collected with mobile eye-tracking devices (Tobii glasses) and

Interest in empirical work in combination with arthistorical questions.

Up to 4

IR II, S-I, MA

Project	*Description*	*Covid-19 Information*	*Required Qualifications*	*Places*	*Level*
	qualitative data will be collected in the form of short interviews with museum visitors. Summer term 2022. **Right to the Museum?** Luise Reitstätter, Karolin Galter, Jubiläumsfonds-Projekt Which museum concepts of the public can we trace in archival documents from founding statues to current mission statements? And, how are museums perceived by the local audience today? These two questions led our archival and field research in the last months. Starting in October 2021 we will delve into comparative data analysis.				
Improvisation Dr. Lukas Zenk Donau-Universität Krems - Universität für Weiterbildung, Fakultät für Wirtschaft und Globalisierung, Department für Wissens- und Kommunikationsmanagement web	The aim of this research project is to develop a framework for organizational improvisation. In this framework, factors for the complex and multidimensional ability of people to improvise in their organizational situation will be identified and described. Based on this basic scientific research, the framework will be used to develop prototypical designs for interventions in order to practically support the improvisational ability of people in organizations. (improvisation.science)	Virtual collaborations possible. Please contact Dr. Lukas Zenk		1-2	IR II, S-I
Word-formation constructions / Cognitive linguistics and corpus linguistics Dr. Stela Manova ICLTT/Philosophy web	Usage-based research on the word-formation patterns in a language. The approach followed is a distributional one, i.e. the combinatorial properties of an element (a piece of word structure) in a corpus serve for that element's identification and definition. The goal is to better understand the nature of the pieces of structure that serve for construction of words.		Specialization in cognitive linguistics and corpus linguistics / Basic knowledge in linguistics	1	IR II, S-I, MA

Project	*Description*	*Covid-19 Information*	*Required Qualifications*	*Places*	*Level*
Word-formation in the mental lexicon / Cognitive linguistics and psycholinguistics Dr. Stela Manova ICLTT/Philosophy web	This research is with a focus on the organization of the mental lexicon. By testing native-speaker intuitions, the idea is to establish what is listed in the lexicon and how words are constructed there		Specialization in cognitive linguistics and psycholinguistics / Basic knowledge in linguistics	1	IR II, S-I, MA
Natural Language Processing (NLP) without grammar: algorithms and applications Dr. Stela Manova ICLTT/Philosophy web	Recent approaches to NLP do not involve grammar (linguistic information of any kind) but treat all words as units of the same type and model human language with the help of neural networks that, roughly speaking, control for frequency of use of words and their combinations (n-grams). In a similar fashion, this project seeks to establish the possible applications of NLP based on algorithms (with a focus on the Fibonacci sequence), n-grams and frequency.		Specialization in cognitive linguistics and psycholinguistics / Basic knowledge in linguistics	1 (+1)	MA (+ IRII, S-I)
Individual differences in second/foreign language learning (including polyglotism, and language learning through non-formal methods) Susanne Maria Reiterer Unit of Language Learning and Teaching Research web	For students interested into second language acquisition in general, but especially the psycho-cognitive aspects of individual differences in language learning ability (language aptitude) and interfaces to other cognitive systems (musicality, personality, memory…) and language learning methods in non-formal circumstances (e.g. online, new media).	It should be possible according to the current rules and regulations (subject to the provisions) to meet on site in the lab/office/department with mask and caring for safety distances. Naturally a large proportion (>50%) of work can always be carried out from home / distance (home office principle). Online/virtual discussion meetings also possible.	Experience in or interest for testing human participants, knowledge about psychometrics, statistics (e.g. SPSS, Excel), qualitative/and or quantitative psycho-social research methods. Willingness to pursue secondary research on theoretical and practical aspects concerning the individual project.	1	IR II, S-I (10 ECTS), MA(?)

Project	*Description*	*Covid-19 Information*	*Required Qualifications*	*Places*	*Level*
Language Café and multilingual societies Susanne Maria Reiterer Unit of Language Learning and Teaching Research web	A second research focus concerns non-formal language learning strategies which are emerging nowadays in multilingual societies or areas, as e.g. the phenomenon of the "language cafe".	It should be possible according to the current rules and regulations (subject to the provisions) to meet on site in the lab with mask and caring for safety distances. Naturally a large proportion (>50%) of work can always be carried out from home / distance (home office principle). Availability of cafes is problematic in COVID times generally because of governmental restrictions in public places/gastronomy.	Experience in or interest for testing human participants, knowledge about psychometrics, statistics (e.g. SPSS, Excel), qualitative/and or quantitative psycho-social research methods. Willingness to pursue secondary research on theoretical and practical aspects concerning the individual project.	1	IR II, S-I (10 ECTS), MA(?)
The (phon)aesthetics of second language learning – phonetic chill Susanne Maria Reiterer Unit of Language Learning and Teaching Research web	This new research project focuses on the aesthetic, psychoacoustic, cognitive, social and emotional motivations of why individuals report to perceive certain foreign languages as more “attractive”, “melodious” etc. and thus more rewarding/interesting to be learned. For students interested in foreign languages, especially sounds of languages.	It should be possible according to the current rules and regulations (subject to the provisions) to meet on site in the lab with mask and caring for safety distances. Naturally a large proportion (>50%) of work can always be carried out from home / distance (home office principle).	Experience in or interest for acoustic stimulus creation, human voice, voice recordings, testing human participants, knowledge about psychometrics, acoustic software (e.g. Praat, Adobe Audition). Willingness to pursue secondary research on theoretical and practical aspects concerning the individual project.	1	IR II, S-I (10-15 ECTS), MA

Title of Project
(open-themed project)

Paolo Petta

Dept.Philosophy, Univ.Vienna and Med.Univ.Vienna and OFAI (Austrian Research Institute for Artificial Intelligence)

Aims and content:

This open-themed project provides the opportunity to productively apply and extend one's knowledge and skills in cognitive science — in particular also with a view towards understanding and mastering the requirements for the specification and successful implementation of a meaningful master thesis undertaking.

The scope of the project thus comprises *all* of:

- the shaping (motivating and planning);
- the management; and
- the implementation

of a valid scientific undertaking of personal curricular relevance, commensurate to the candidate's competence and the available resources (including the work hours budget). That is, the forms and aims of the individual projects will necessarily reflect the (differences in) qualification and experience, whether more of a “first peek” into a domain or a more advanced investigation that builds on personal background and prior results.

While there is latitude in terms of relative emphases placed on these different components, all these parts are to be covered (i.e., explicitly addressed and not just “executed”) in each case (cf. also the structure of the learning contract document forms).

Concerning the actual topic to be researched:

Next to the particular opportunity to combine the project with participation in the VU and SE, "Computer Models of ``The Mind’"" offered through MUW (the Medical University of Vienna: VU 901.967 and SE 901.968), applicants are encouraged to submit expressions of interest and individual proposals of topics (e.g. related to other curricular work) at their earliest opportunity: the possibility to accommodate these suggestions will be clarified in individual direct (virtual) meetings. Supervision expertise includes, but is not limited to:

As a consequence of COVID, particular attention is placed on viability — of the individual research projects and of the course itself. In particular, the practicality of involvement/participation in ongoing research activities will be evaluated in due care. In a valuable management exercise, contingency planning of the project shall cover “conservative” scoping implementable through tele-collabration, in addition to identified relevant physical collaboration.

Minimum requirements

- Scientific productivity in the English language
- Literacy, ability, and demonstrated engagement enabling successful collaboration through electronic platforms – including the use of electronic tools and adoption of formats and other knowledge and skills
- Availability, basic ability, and demonstrated dedication to:
  - collaborate in the development and specification of a sound research proposal documented in an authorized learning contract;
  - implement one's responsibilities in the management and implementation the project plan specified in the authorized learning contract;
  - contribute to the success of the projects
- Basic orientation in the field of cognitive science (as covered in the first year of the curriculum)
- Ability of improve knowledge and skills through instruction and supervised self-study.

2-4

Levels:
10 ECTS Project, 15-20 ECTS Project, and/or Master’s Thesis

- Artificial Intelligence (theoretical, scientific, engineering, policy-making, ethical facets) and Computationalism
- Computational cognitive architectures
- Affective computing and modelling
- Human-Computer interaction and collaboration
- The interplay of theory, modelling, empirical research, engineering, application design and deployment, and society
- Multiagent systems: computing as interaction
- A range of application-specific domains, including educational, medical, organisational, social contexts

All project activities will be embedded in continuous discussion and reflection — of ethical dimensions; of motivations and aims; of the contextual embedding (stakeholders and contributions of different disciplines); of the (choice of) particular implementation schemes; of the significance of particular outcomes obtained or difficulties encountered; of relevant established cultures, conventions, and best practices.

Method:

The course will be supported by electronic collaboration platforms and tools.

There will be a weekly individual “Jour Fixe” meetings to assess individual progress and project matters, as well as more extended topical joint work sessions to address specific content matters, complemented by plenary sessions address any pending overarching topics of general relevance and enabling exchanges across the project activities.

The possibility of collaborations among participants will be assessed in the light of critical interdependencies and clarification of credit assignment (to be duly documented in the learning contract).

Assessment:

- Demonstrated effort and tangible results commensurate to the claimed effort and in line with the success criteria defined in the authorized learning contract.

Project	*Description*	*Covid-19 Information*	*Required Qualifications*	*Places*	*Level*
	• Completion of the personal learning contract (within the first four weeks of the project) • Evaluation of the milestones (and associated deliverables) defined in the learning contract • Continuous formative evaluation of progress according to the work plan (Jour Fixes; see "Methods") • Mid-term and final overall evaluation and review of the project experience **Evaluation criteria** • Productivity and efficiency in carrying out specific tasks, discussion of results and their significance • Dependable, continuous, active and constructive project collaboration (including the regular Jour Fixes) • Dependable, timely and commensurate communication and documentation through the online collaboration platforms • Achievement of Project milestones (project deliverables), evaluated against the criteria specified in the learning contract • Adherence to identified relevant conventions, best practice, and standards.				

Project	*Description*	*Covid-19 Information*	*Required Qualifications*	*Places*	*Level*
[See description] Soheil Human Institute of Information Systems and New Media, Vienna University of Economics (WU Wien) web	If you are interested in research on: • Accountability and controllability of computational cognitive models • Cognitive Personal Assistant Systems • Human needs • Human values • Societal consequences of cognitive modeling • Predictive processing • Framing of information system (nudging) • Cognitive user interfaces • Cognitive information economies • Social imaginaries • Human-computer interaction • Intersection of European General Data Protection Regulation (GDPR) and Computational Cognitive Modeling • Semantic Web Technologies, Knowledge Engineering and Ontology development • Application of computational cognitive modeling from socioeconomic perspective please make an appointment for more details.		Please make an appointment for more details	1-2	IR II, S-I

Project	*Description*	*Covid-19 Information*	*Required Qualifications*	*Places*	*Level*
Incentivising Open Data Exploration through Needs Management Soheil Human Institute of Information Business at the Vienna University of Economics and Business web	Needs satisfaction plays a fundamental role in well-being of biological cognitive systems, including humans. Hence, Understanding citizens' needs is crucial for developing a successful social and economic policy. This notwithstanding, acquisition, representation, analysis, and visualisation of citizens' needs remain areas where support by dedicated computational tools is very limited. Also applications of needs data in the design of online services has not been thoroughly analyzed. The goal of this project is to use existing needs profiles for organizing the catalogs of Open datasets and Open Data Apps, available at at the Open Government Portal of Vienna (https://open.wien.gv.at/site/open-data/) and at the independent Austrian Open Data Portal (https://opendataportal.at). [BFUP] Beno, M., Figl, K., Umbrich, J., Polleres, A. (2017) Open Data Hopes and Fears: determining the barriers of Open Data. CeDEM 2017 https://aic.ai.wu.ac.at/~polleres/publications/Beno-etal2017CeDEM.pdf [HFKS] Human, S., Fahrenbach, F., Kragulj, F., Savenkov, V. (2017). Ontology for Representing Human Needs. Proc. of 12th Intl. Conference on Knowledge Engineering and Semantic Web, Szczecin, Poland. (to appear: see preprint at https://github.com/openeed/ond-family) [OpeN] The OpeNeeD Ontology: https://github.com/openeed [KaK] Kaiser, A., & Kragulj, F. (2016). Bewextra: Creating and Inferring Explicit Knowledge of Needs in Organizations. Journal of Futures Studies, 20(4): pp. 79-98. [Dea1] Dean, H. (2014). Understanding human need. Bristol: Policy Press.		Internship position You will develop a web catalog of open datasets and apps based on different principles of artefact grouping. Given an existing citizen's need profiles (encoded as the ontology [OpeN]), a correspondence between the needs on the one hand, and datasets and apps on the other hand will be established, and the digital artefacts (datasets & apps) will be grouped according to needs they are related to. A userexperience experiment will be conducted to compare the traditional interface (based on predefined categories) and the need-based one to assess if organising the data according to the identified needs has positive impact on user experience, and motivate users to invest time into exploring Open Data.	1	IR II, S-I

Project	*Description*	*Covid-19 Information*	*Required Qualifications*	*Places*	*Level*
Ontology Representation of Needs Profiles Soheil Human Institute of Information Business at the Vienna University of Economics and Business web	Needs satisfaction plays a fundamental role in human well being [TaD]. Hence understanding citizens' needs is crucial for developing a successful social and economic policy [Dea1, Dea2]. This notwithstanding, the concept of need has not yet found its place in systems and online tools for citizen participation. In fact, assessing needs itself remains a laborintensive, mostly offline activity, where only a limited support by computational tools is available. While only a few methodologies for assessing and systematizing needs exist to date, including BEWEXTRA [KaK] developed in the WU Vienna, acquisition, representation and analysis of citizens' needs remain areas where support by dedicated computational tools is either limited or not existing. [Dea1] Dean, H. (2014). Understanding human need. Bristol: Policy Press. [Dea2] Dean, H. (2015). Social rights and human welfare. London: Routledge. [HFKS] Human, S., Fahrenbach, F., Kragulj, F., Savenkov, V. (2017). Ontology for Representing Human Needs. Proc. of 12th Intl. Conference on Knowledge Engineering and Semantic Web, Szczecin, Poland. (to appear: see preprint at https://github.com/openeed/ond-family) [OpeN] The OpeNeed Ontology: https://github.com/openeed [KaK] Kaiser, A., & Kragulj, F. (2016). Bewextra: Creating and Inferring Explicit Knowledge of Needs in Organizations. Journal of Futures Studies, 20(4): pp. 79-98. [TaD] Tay, L., & Dieer, E. (2011). Needs and subjective wellbeing around the world. Journal of personality and social psychology, 101(2): 354.		Internship position In this project you will contribute to the creation of such tools by continuing the digitalization of a needs study, conducted with the citizens of the Vienna quarter Stuwerviertel following the BEWEXTRA methodology [HFKS]. You will help presenting the results of the study with an increased granularity using the OpeNeed ontology [OpeN], and then use SPARQL query language to provide examples of semantic queries against the resulting needs data. The project paper will report on your experiences and ideas for the improvement of OpeNeed, and analyze ways of improving computer support for needs assessment.	1	IR II, S-I

Project	*Description*	*Covid-19 Information*	*Required Qualifications*	*Places*	*Level*
Austrian Roots of Cognitive Science Isabella Sarto-Jackson KLI web	How did the controversy between Austrian scientists Boltzmann/Schrödinger (atomism) and Mach (energetism & atoms as „conceptual models") influence Cognitive Science´s conceptualization of the evolution of cognition?		Interest in the history of science and philosophy of science	1	IR II, S-I MA
Organizational learning and Knowledge based Management ao. Univ. Prof. Dr. Alexander Kaiser Research Group Knowledge based Management, Vienna University of Economics and Business web	We do research in the field of knowledge based management and organizational learning. More precisely, we offer projects upon negotiation in the field of vision development, need-based innovation, organizational (un)learning and systemic coaching.		Motivation to work in an interdisciplinary team; some experience with qualitative research methods preferable; If field work is involved, German skills are necessary	1	IR II, S-I
Organizational learning and Knowledge based Management ao. Univ. Prof. Dr. Alexander Kaiser Research Group Knowledge based Management, Vienna University of Economics and Business web	The proposed IR2-topic deals with the operationalization of three previously identified types of knowledge in the context of need-based organizational learning. It is intended for students seeking to explore the intersections of cognitive science and business/organizational related fields in a practical yet interdisciplinary way.		Interest in interdisciplinary research and organizational learning.	1	IR II, S-I

Project	*Description*	*Covid-19 Information*	*Required Qualifications*	*Places*	*Level*
New hypotheses for research on autism and music, Part 1: Large-scale replication of potential biomarkers in rs-fMRI Giorgia Silani, Christian Gold Department of Applied Psychology: Health, Development, Enhancement and Intervention	**Background:** Autism is a "social disorder", and music is a "social art". Music therapy may help people with autism to develop social engagement, but mechanisms are not clear. Brain areas including the superior temporal sulcus (STS), right temporo-parietal junction (rTPJ), and right supramarginal gyrus (rSMG; relevant for empathy and theory of mind), and functional connectivity between auditory, motor, and sensory regions (relevant for sensorimotor integration) have been suggested to be of relevance. However, these findings were based on relatively small samples. **Methods:** This project will aim to determine structural and functional differences or similarities between people with/without autism in relevant brain areas, using MRI and resting-state fMRI data from a large, publicly available dataset (ABIDE-I and ABIDE-II, combined n>2000). **Relevance:** Given the "replicability crisis" in psychology, the findings from this project will provide a solid basis for future intervention studies of music therapy and related interventions. **Note**: Other projects related to music and autism using different methodology may become available; further information on request.		Desirable: experience with analysing fMRI data; programming skills in MATLAB (or R)	1-2	MA

Project	*Description*	*Covid-19 Information*	*Required Qualifications*	*Places*	*Level*
New hypotheses for research on autism and music, Part 1: Large-scale replication of potential biomarkers in rs-fMRI Giorgia Silani, Christian Gold Department of Applied Psychology: Health, Development, Enhancement and Intervention	**Background:** Many people with autism have a high interest or special skills in music; some can benefit from music-based interventions. However, little is currently known about the ways and the extent people with autism engage in music activities in daily life. **Methods**: Based on previously constructed scales and a currently ongoing survey in other countries, a survey of music engagement will be conducted in an Austrian clinical sample (from clinical institutions in St. Pölten or Vienna, n=50-100) and a matched non-clinical sample. **Relevance:** Better knowledge of music use in daily life, including functional uses of music, will be important to inform		Survey methods experience	1	MA
New hypotheses for research on autism and music, Part 1: Large-scale replication of potential biomarkers in rs-fMRI Giorgia Silani, Christian Gold Department of Applied Psychology: Health, Development, Enhancement and Intervention	**Background**: A large multinational randomised controlled trial of music therapy for children with autism spectrum disorder did not find clinical effects; this was in contrast to many smaller trials. One reason may be the heterogeneity of the population, in connection with the focus on a distal downstream outcome. **Methods:** Re-analysis of an existing dataset (n=364) with a focus on individual symptoms that may be linked to specific mechanisms of joint music-making. Path models or structural equation models will be used to determine which of these symptoms at baseline are able to predict clinical benefits. **Relevance:** Better understanding of who on the autism spectrum may be most likely to benefit from music therapy.		Structural equation modelling (SEM) experience	1	MA

Project	*Description*	*Covid-19 Information*	*Required Qualifications*	*Places*	*Level*
The Neuropharmacology of social motivation in autism Giorgia Silani Department of Clinical and Health Psychology www.silanilab.com	The main objective of this project is to explore the effect of the combined application of naltrexone and oxitocin on social attention and social motivation in neurotypical and autistic individuals. A dual eye-tracking setup will be used used to simultaneously record gaze behavior of two persons facing each other, under pharmacological challenge.	Practical work is possible	Highly motivated, independent, flexible and self-organized	2	
The proximate cognitive and neural mechanisms of sexual objectification: from empathy to (pro)social behavior Giorgia Silani Department of Clinical and Health Psychology www.silanilab.com	Three main aims will be addressed in the project: 1) to determine the consequences of sexual objectification on social behavior (Aim 1); 2) to determine which proximate neural and cognitive mechanisms are responsible for such behavior (Aim 2); 3) to explore individual factors (in the perceiver) that lead to objectification of sexualized2 individuals, and its consequences (Aim 3).Functional magnetic resonance imaging (fMRI), self-report questionnaires and behavioral data from 160 healthy female and male participants will be collected. Participants will engage in an experimental paradigm allowing the assessment of empathy and prosocial behavior towards male and female confederates as well as behavioral tasks tailored to assess the cognitive mechanisms previously associated to both sexual objectification and empathy	Practical work is possible	Highly motivated, independent, flexible and self-organized	2	
A translational psychiatric approach to adolescent ano-rexia nervosa - from genes to brain systems and behaviors Giorgia Silani Department of Clinical and Health Psychology www.silanilab.com	In order to achieve a reward-based mechanistic model of AN, we will use a newly developed paradigm with high translational value, in combination with functional magnetic resonance imaging, to investigate the neural and behavioral underpinning of reward processing (social, and non-social) in AN patients at different stage of the illness (N=90, 15 of them followed longitu-dinally), and matched controls (N=60, 15 of them followed longitudinally). Precise phenotyping, genotyping and neural fingerprint (MRSI, q-MRI) will be performed in order to account for individual variability.	Practical work is possible	German proficient, Highly motivated, independent, flexible and self-organized	2	

Project	*Description*	*Covid-19 Information*	*Required Qualifications*	*Places*	*Level*
Brain-Computer Interfaces Moritz Grosse-Wentrup Research Group Neuroinformatics, Faculty of Computer Science, University of Vienna web	Brain-Computer Interfacing (BCI) enables the control of external devices such as wheelchairs or robotic arms for severely paralyzed patients by mind control. Multiple projects of to advance the state-of-the-art in BCI are available within the research group Neuroinformatics, ranging from cognitive strategies for patient training over feedback design to neural decoding algorithms.		Students should have an interest in working in interdisciplinary research teams, be open to working with actual patients, and have basic programming skills.		IR II, S-I, MA
Conceptualizing exposure therapy as a dynamic feedback system Prof. Frank Scharnowski, Cindy Lor MScDepartment for Basic Psychological Research and Research Methods web	We aim at better understanding and optimizing exposure therapy. Specifically, we investigate psychological, peripheral physiological and neuroimaging measures to computationally model exposure therapy as closed-loop feedback systems.		Motivation to conduct interdisciplinary experimental research; good organization and time management; creativity; basic programming skills (e.g. MATLAB, Python, R, ...) are an advantage	5	IR II, S-I, MA
Real-time fMRI Neurofeedback Prof. Frank Scharnowski, Andrew Nicholson, PhD Department for Basic Psychological Research and Research Methods web	We will conduct multiple studies investigating the ability to regulate emotional states using real-time fMRI neurofeedback in both healthy individuals and psychiatric patient populations. This method consists of using brain computer interfaces that provide feedback of neural states using brain imaging.		Independent learners, highly motivated, long-term career aspirations in neuroscience.	5	IR II, S-I or MA
Machine-learning with psychological data Prof. Frank Scharnowski, David Steyrl, PhD Department for Basic Psychological Research and Research Methods	Generally, machine-learning techniques are powerful tools for data analysis. Particularly in psychology, where heterogeneous, multimodal data are ubiquitous. We offer the chance to dive into this hot topic and to gain hands-on experience with real world machine-learning applications.		basic programming skills (e.g. MATLAB, Python); enjoying programming	2	S-I or MA

Project	*Description*	*Covid-19 Information*	*Required Qualifications*	*Places*	*Level*
Comparative cognition in cichlids Dr. Arne Jungwirth https://www.vetmeduni.ac.at/klivv/ueber-uns/unser-team/wissenschafter/jungwirth-arne Dr. Stefan Fischer https://www.vetmeduni.ac.at/klivv/ueber-uns/unser-team/wissenschafter/fischer-stefan Prof. Leonida Fusani https://cogbio.univie.ac.at/people/staff/leonida-fusani/ Konrad Lorenz Institute of Ethology Department of Behavioral and Cognitive Biology	We are looking for 1-2 highly motivated students interested in a Master's project in behavioural biology and cognition. The project will investigate the social and ecological drivers of cognitive abilities using several species of cichlid fish from Lake Tanganyika. Cognitive abilities vary considerable between species, even between closely related species that live in the same habitat. Thus, a major question in evolutionary biology is to better understand species-specific differences in cognitive abilities and particularly to examine the social and ecological factors driving these differences. The cichlids from Lake Tanganyika are an ideal model system for these questions because all species occurring in Lake Tanganyika are closely related but differ in key ecological and social traits. In this project we will use (1) an established task to test for cognitive abilities (reversal learning), and (2) several closely related species that differ in life-history characteristics to probe key predictions in the study of comparative cognition. The work will be based at the Konrad Lorenz Institute for Ethology which is located on Wilhelminenberg in the 16th district.	The student(s) will be able to come to the institute to do the experiments, even if stricter measures are in place due to COVID-19. In such a case in-person meetings will be reduced to a minimum, but online meetings will still be possible. In the case of 2 students, daily time schedules for data collection will be assigned to cease further contaminations.	We are particularly interested in 1-2 students with a keen interest in scientific questions, that would like to research fish behaviour and cognition, are able to work independently and as part of a team. Our daily communications are in English, and the student(s) are required to have good knowledge of English and, preferably, the thesis should be written in English.	1-2	MA

Project	*Description*	*Covid-19 Information*	*Required Qualifications*	*Places*	*Level*
Sliders for decision making Laura Koesten, Torsten Möller Computer Science, Research Group for VDA web	Siders on interfaces provide a range to select an input value. Sliders can restrict users to entering valid values by only offering a valid range, or they can be used to support multicriteria decision making. In this project we aim to compare different types of sliders for decision making. This includes triangular, binary and single, sliders as well as “scented widgets”, which are embedded visualizations to facilitate navigation in information spaces. (See for instance https://dl.acm.org/doi/pdf/10.1145/3240167.3240185) Tasks: • Creating interfaces using different slider types, develop simple alternatives of slider components. • Design an online user study (including task design, recruitment, usability evaluation). • Analyse quantitative and qualitative data from the user study.	Remote collaboration possible	Knowledge in: HCI (Human Computer Interaction) FDA (Foundations of Data Analysis) Programming languages: Python or R	1	IR II, S-I
Understanding climate change data Laura Koesten Computer Science, Research Group for VDA web	Data visualisations, such as charts, are often used to communicate data about climate change, both in research and in popular news sources. This project investigates how people make sense of common data visualizations about climate change by conducting interview studies with doctoral researchers and students at the University of Vienna. Tasks: • Collect sample types of charts commonly used with respect to climate change (e.g. on social media). • Design and conduct an interview study. • Qualitative data analysis.	Remote collaboration possible	FDA (Foundations of Data Analysis) VIS (Data Visualization)	1	IR II, S-I

Project	*Description*	*Covid-19 Information*	*Required Qualifications*	*Places*	*Level*
Understanding COVID-19 data Laura Koesten Computer Science, Research Group for VDA web	Data visualisations, such as charts, are used frequently to communicate data about COVID-19, both in research and in popular news sources. In this project we investigate the types of questions that are frequently asked during the COVID-19 pandemic and how charts are used to answer them. We will do this by collecting commonly asked questions and conducting a qualitative study about how people answer these questions for themselves using COVID data visualisations. Tasks: • Collect a sample dataset of COVID related questions (from online resources). • Design a study aiming to investigate people's sensemaking practices.	Remote collaboration possible	FDA (Foundations of Data Analysis) Possibly VIS (Data Visualization)	1	IR II, S-I
Data documentation Laura Koesten Computer Science, Research Group for VDA web	Documenting data is as important as publishing it. There are many proposals that describe the content and format of data documentation, capturing the entire data science lifecycle, from collecting the data (for instance using sensors) to cleaning and analysing it. The aim of this project is twofold: 1. To apply these documentation proposals on known and less known datasets to understand how easy to use they are and how subjective documentation practices are. 2. To explore collaborative documentation practices to reduce inconsistencies in documentation. To do this we will investigate the differences when people use traditional metadata schemata versus a more creative setting, such as using Jamboard, to describe a dataset. Tasks: • Design, conduct and analyse a qualitative study.	Remote collaboration possible	FDA (Foundations of Data Analysis) Basic knowledge of qualitative research methods	1	IR II, S-I

Project	*Description*	*Covid-19 Information*	*Required Qualifications*	*Places*	*Level*
Data descriptions Laura Koesten (+Kathleen Gregory) Computer Science, Research Group for VDA web	Metadata, or standardized descriptions of data, are powerful surrogates for data. They impact how data are discovered, how data are understood, and how data are used. Metadata are most often created manually at data repositories, although there is great variation in how this is done. This project will use a large-scale survey (e.g. an online questionnaire) to understand the metadata generation processes at data repositories included in the re3data.org database. Tasks: • Create sample of data repositories to include. • Create questionnaire. • Recruit respondents. • Analysis of questionnaire responses.	Remote collaboration possible	FDA (Foundations of Data Analysis) Programming languages: Python or R	1	IR II, S-I
Common data or spreadsheet fears Laura Koesten Computer Science, Research Group for VDA web	We are increasingly exposed to data in different aspects of our lives, be that in an ever growing range of professions reliant on data analysis, or in our private lives exposing us to data about us, our activities or using data to inform our decisions. However, many people still do not feel comfortable engaging with a spreadsheet, nor do they have the skills to perform more complex types of data analysis. In this project we aim to conduct a qualitative study to better understand people's preconceptions by observing them interacting with a spreadsheet and discussing their experiences. Tasks: • Design a mixed method study. • Recruit respondents. • Qualitative data analysis.	Remote collaboration possible	FDA (Foundations of Data Analysis) Possibly VIS (Data Visualization) Possibly HCI (Human Computer Interaction)	1	IR II, S-I

Project	*Description*	*Covid-19 Information*	*Required Qualifications*	*Places*	*Level*
Understanding data conversations to understand data science communities Laura Koesten (+Kathleen Gregory) Computer Science, Research Group for VDA web	The project will build a corpus of conversations around datasets and data science activities from forums of data communities such as Kaggle, data.world, or Reddit. The aim is to carry out content and community analysis, using qualitative or quantitative methods to understand how people talk about data and to learn what that means for data community platform design. Tasks: • Collecting available forum messages of two data platforms (e.g. Kaggle). • Getting familiar with the data set. • Content and community analysis of the messages and their authors.	Remote collaboration possible	FDA (Foundations of Data Analysis) VIS (Data Visualization) Basic qualitative and quantitative data analysis Programming languages: Python or R	1	IR II, S-I, MA
How do people understand charts? Laura Koesten Computer Science, Research Group for VDA web	Textual descriptions of charts are relevant for a variety of application and research areas. In this project we will create a crowdsourcing study to collect a dataset of charts annotated with a description of their key messages as perceived by the readers of the charts. The data will consist of images (charts) and free text interpretations of the charts. We will analyse the resulting descriptions qualitatively and visualise the results in an interactive manner. Tasks: • Qualitative (content analysis) and quantitative analysis of text and image data. • Apply basic NLP techniques to cluster and analyse free text data. • Design a simple user interface to explore the data corpus interactively and present results.	Remote collaboration possible	FDA (Foundations of Data Analysis) VIS (Data Visualization) Programming languages: Python or R, Javascript, HTML	1	S-I, MA

Project	*Description*	*Covid-19 Information*	*Required Qualifications*	*Places*	*Level*
Social learning kea parrots Wein-Schwing, Amelia, Univ.-Ass. Mag PhD Comparative Cognition, Messerli Research Institute web	This project will look at aspects of social learning, specifically pertaining to motor imitation, in kea parrots. It will take place at the Kea Lab, which is located at the Haidlhof Research Station 30 Km south of Vienna near Bad Voeslau.	Data collection takes place at the Haidlhof Research Station. 2G proof required, FFP2 masks indoor.	• Ability to work with large parrots in an outdoor aviary under extreme weather conditions. • Must be willing to travel to the research station several times/week. • Experience with animals is highly recommended.	1 student per semester	Semester project at 20 ECTS. Possible master's project in Fall 2022.
Tonal language experience and the morphology of Heschl's Gyrus Vienna Cognitive Science Hub Prof. Narly Golestani, Dr. Olga Kepinska http://brainandlanguagelab.org	Experience with tonal languages has previously been associated with brain structural markers (gray and white matter volume, connectivity) in specific brain regions. This project will build on previous research, and investigate whether a continuously indexed measure of exposure to tonal languages in multilingual participants can be related to the morphology of Heschl's Gyrus, i.e., one of the main brain structures supporting processing of auditory information.	Data is available; on-site work and in-person meetings are possible	BA or BSc; experience with statistics required, and knowledge of the basics of neuroimaging/neuroanatomy would be an asset	3	20 ECTS Project, and/or Master's Thesis
Executive functioning and multilingual language experience Vienna Cognitive Science Hub Prof. Narly Golestani, Dr. Olga Kepinska http://brainandlanguagelab.org	The idea of a bilingual advantage in aspects of cognitive control is hotly debated within the field of bilingualism. This project will aim at testing the effect of the degree of multilingual language experience on executive functioning.	Data is available; on-site work and in-person meetings are possible	BA or BSc; experience with statistics required, and knowledge of the basics of neuroimaging/neuroanatomy would be an asset	1	20 ECTS Project, and/or Master's Thesis
Heritability of Heschl's Gyrus Vienna Cognitive Science Hub Prof. Narly Golestani, Dr. Olga Kepinska http://brainandlanguagelab.org	Using publicly available data, this project will investigate the degree of heritability of Heschl's Gyrus morphology, i.e., one of the main brain structures supporting the processing of auditory information	Data is available; on-site work and in-person meetings are possible	BA or BSc; experience with statistics required, and knowledge of the basics of neuroimaging/neuroanatomy would be an asset	1	20 ECTS Project, and/or Master's Thesis

Project	*Description*	*Covid-19 Information*	*Required Qualifications*	*Places*	*Level*
Current vs. cumulative language exposure and brain function Vienna Cognitive Science Hub Prof. Narly Golestani, Dr. Olga Kepinska http://brainandlanguagelab.org	Language experience in multilingual participants can be quantified in different ways. One possibility is to index the amount of exposure around the moment of testing; another is to gather information about exposure accumulated over time. It has not yet been investigated which of these language exposure indices (current or cumulative) better explains brain functional data. This project will aim at finding neural markers for both of these language exposure indices in multilingual children.	Data is available; on-site work and in-person meetings are possible	BA or BSc; experience with statistics required, and knowledge of the basics of neuroimaging/neuroanatomy would be an asset	1	20 ECTS Project, and/or Master's Thesis
Uncovering mechanisms of artificial grammar learning Jutta L. Mueller Institute of Linguistics, University of Vienna https://psy-ling.univie.ac.at/en/	This research focuses on cognitive and neurophysiological mechanisms underlying the extraction of complex structure from auditory input. Depending on interest and previous experience there is the possibility to conduct a behavioral study on the role of segmental information (i.e. consonants vs. vowels) for the learning of a repetition rule or to conduct an EEG study focusing on oscillatory activity during learning and generalization of hierarchical structure from auditory input. Participant groups: Adults, potentially children.	Work in the lab is possible if the current COVID-19 safety measures are respected.	Some programming experience is desirable (e.g. MATLAB, R, Python), strong interest in cognitive (neuro)science of language learning and its interfaces with non-linguistic cognition.	1-2	all levels MA theses
Language as a tool for higher order cognition Jutta L. Mueller Institute of Linguistics, University of Vienna https://psy-ling.univie.ac.at/en/	Language has been argued to aid various cognitive functions such as categorization, task switching, novel task learning, abstract thinking, to just name a few. Even moral cognition may be influenced by the linguistic code we use. Several planned projects in our group target questions from this broad domain capitalizing on tools that measure interindividual differences in verbal thinking mode. Further, there is the possibility to do projects with developmental populations investigating interindividual differences in abstract thinking depending on vocabulary size.	Work in the lab is possible if the current COVID-19 safety measures are respected. Some of the studies possible as on-line studies.	Some programming experience is desirable (e.g. MATLAB, R, Python), strong interest in cognitive (neuro)science of language and its interfaces with non-linguistic cognition.	1-2	all levels MA theses

Project	*Description*	*Covid-19 Information*	*Required Qualifications*	*Places*	*Level*
Formal Theory Specification Prof. Dr. Susann Fiedler Head of Institute for Cognition and Behavior Hooman Habibnia PhD student at the Institute for Cognition and Behavior Vienna University of Economics and Business | Department Strategy & Innovation Website	In Karl Popper's eyes, good and bad theories are distinguished by their empirical content, directly relating to theories' falsifiability. He suggests two criteria for evaluating the empirical content of a theory; a) level of universality and b) degree of precision (Popper, 1934). Many theories in social psychology are loosely formulated and lack precision (Glöckner & Betsch, 2011). In this project, we will pick a social psychology theory and proceed with the following steps: 1. We will critically evaluate the selected theory based on Popperian criteria and study how this theory is operationalized. 2. Understanding the theory's limitations and boundaries, we will address its potential loopholes. 3. We will formalize and specify the theory to reduce its ambiguity and improve its universality and precision. Popper, K. R. (1934). The Logic of Scientific Discovery (Vol. 38, Issue n/a, p. 173). Routledge. Glöckner, A., & Betsch, T. (2011). The empirical content of theories in judgment and decision making: Shortcomings and remedies. Judgment and Decision Making, 6(8), 711. Retrieved from https://www.proquest.com/scholarly-journals/empirical-content-theories-judgment-decision/docview/1011297243/se-2	Remote		2-3	IR II S-I

Project	*Description*	*Covid-19 Information*	*Required Qualifications*	*Places*	*Level*
Commitment and memory Christophe Heintz, Francesca Bonalumi Central European University	How do we (mis)remember social commitments? The proposed studies will investigate how people remember utterances that commit the speaker to a given behaviour. Our hypothesis is that listeners will retrieve utterances according to what a speaker is committed to, and will use their memories as evidence to hold the speaker accountable for a potential violation. In the project, the student will help with developing the stimuli, implementing the study on an on-line platform (Testable or Qualtrics) and analyzing the data. Relevant literature: Bonalumi, F., Scott-Phillips, T., Tacha, J., & Heintz, C. (2020). Commitment and Communication: Are we committed to what we mean, or what we say? Language and Cognition, 1–25. Brewer, W. F. (1977). Memory for the Pragmatic Implications of Sentences. Natural History, 65. Mahr, J. B., & Csibra, G. (2018). Why do we remember? The communicative function of episodic memory. Behavioral and Brain Sciences, 41, 1–16.	A desk at CEU can be provided and participation to the activities of the ACES lab encouraged. Work at home is possible if the circumstances require it.	Knowledge in statistics. Interest in memory and/or moral cognition.		20 ECTS
Factors influencing moral judgements Christophe Heintz, Francesca Bonalumi Central European University	Do we disapprove those who violate norms depending on their intentions, or the consequences of their actions? Do these factors influence our intuition of what counts as a fair compensation, and our expectation of how people behave? We ran a set of studies (N=952) to explore these questions. The student will help with data processing, data analyses and interpretation of the data. Relevant literature: Young L, Saxe R. When ignorance is no excuse: Different roles for intent across moral domains. Cognition. 2011 Aug;120(2):202-14. Barrett, H. C., Bolyanatz, A., Crittenden, A. N., Fessler, D. M., Fitzpatrick, S., Gurven, M., ... & Laurence, S. (2016). Small-scale societies exhibit fundamental variation in the role of intentions in moral judgment. Proceedings of the National Academy of Sciences, 113(17), 4688-4693.	Compatible with possible Covid19 restrictions	Knowledge in statistics, experience with MS Excel and statistical tools (e.g., R)		10 ECTS

Project	*Description*	*Covid-19 Information*	*Required Qualifications*	*Places*	*Level*
Tasks distribution in the household (cognition and culture) Christophe Heintz, Francesca Bonalumi Central European University	What determined the tasks distribution in the household? We hypothesize that one factor is what outside options people have. More precisely, individuals might be able to better negotiate what their share of the tasks in the household should be if they have good option outside of their current household. We test this hypothesis with data from multiple small-scale societies, which have different subsistence activities. Tasks: Arranging data from multiple small-scale societies for a comparative, cross-cultural analysis. One difficulty comes from the fact that the data has been collected from different societies, in different years and by different research groups.	Work will be mostly done at home with online communication.	Moderate-advanced Excel skills; basic R.		10 ECTS
Coordination and team reasoning Christophe Heintz, Francesca Bonalumi Central European University	There are cases where it is better to coordinate on one set of action rather than another. For instance, two people living in Vienna are both better off coordinating on a meeting place in Vienna than in a far away city. While such cases of decision making seem extremely simple and natural, the underlying psychological processes might involve mechanisms especially dedicated to group decision making. We have designed some tasks meant to test theories of group decision making in situations where there is a need for coordination. The project will include refining the experimental protocol, running the experiment, doing the analysis and co-authoring a paper.	The experiment shall be run online: participants will play games on a smartphone application. The project can therefore be done under strong Covid-19 restrictions. However, a desk at CEU can be provided and participation to the ACES lab activity will be encouraged.	Knowledge in statistics. Basic knowledge in rational choice theory and/or theories of social cognition would be useful, but it can be acquired.		Master thesis

Project	*Description*	*Covid-19 Information*	*Required Qualifications*	*Places*	*Level*
The pragmatics of visual communication Christophe Heintz, Francesca Bonalumi Central European University	Take the drawing of a square in the context of a mathematical exercise requesting students to demonstrate that diagonals of squares meet in their middle. In this context, the length of the sides of the square should absolutely be ignored. They are irrelevant to the task at hand. Change the context: this same square as part of a drawing in an interior design project. The square, then, is meant to represent, say, a table to be located in a leaving room. What is relevant, now, is not so much the precise angles, but rather the relative size of the square compared to the room, and so the length of the side are especially relevant. What are the underlying cognitive processes that lead us to understand what, of a figure, is meaningful? Post-Gricean pragmatics has an answer: interpreting communicative input, images included, amounts to recovering the communicators' communicative intention. A pragmatic account of the use of figures in mathematics is that figures are means of communication which are interpreted through making inferences about the drawer's communicative intention. In this project, the student will review the literature in the philosophy and cognitive science of mathematics. The student will assess to what extent this literature is compatible with a pragmatic account of the use of figures and images. The project can focus on other field that communicate with images (e.g. architecture).	Theoretical project compatible with Covid-19 restrictions	Students should have a good background in the philosophy of language, in pragmatics, and an interest in the philosophy of mathematics, architecture, or other.		Master thesis