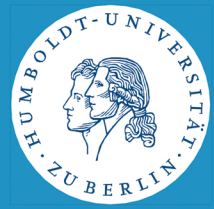




Berlin School of Mind and Brain

Speaker: Arno Villringer



Objectives

The Berlin School of Mind and Brain is an international research school. It offers an interdisciplinary three-year doctoral program. Teaching covers all fields relevant to mind/brain-related research, and students will be supervised by two professors, one from the "mind sciences" and one from the "brain sciences".

The focus of the school is on the interface of traditional humanities and behavioral sciences (philosophy, social sciences, linguistics, behavioral and cognitive psychology) with neurosciences (neurophysiology, psychiatry, computational neuroscience, neurobiology). Main research topics are 'conscious and unconscious perception', 'decision-making', 'language', 'brain plasticity and lifespan ontogeny', and 'mental disorders and brain dysfunction'.

Interdisciplinary Research

Interdisciplinary research on topics related to the mind, such as "conscious and unconscious perception", "decision-making", and "language" needs to be conceived and derived from operational definitions that can be mapped onto those definitions used in the brain sciences, i.e., we need to develop a new "lingua franca" for mind and brain research.

This process is not only confined to terminological and conceptual translation but also calls for new kinds of mathematical description and computational models. The rapidly evolving and tightly knit fields of cognitive modeling and computational neuroscience will thus play a key role in a scientific community that strives to integrate mind and brain research.

Collaboration with Universities and Other Research Institutions

Cooperation among Faculties: Biology, Computer Science, Economics, Law, Linguistics, Medicine, Philosophy, Psychology

Cooperation among Universities: Humboldt-University Berlin, Freie University Berlin, Technical University Berlin, University of Potsdam, Otto-von-Guericke University Magdeburg

Cooperation with Collaborative Research Centers (SFBs): SFB 507 Role of non-neuronal cells in neurological disease, SFB 618 Theoretical Biology, SFB 632 Information Structure, SFB 644 Transformations of Antiquity, SFB 649 Economic Risk, SFB 665 Developmental Disturbances in the Nervous System, SFB TR3 Mesial temporal lobe epilepsies

Collaboration with Other Research Organizations

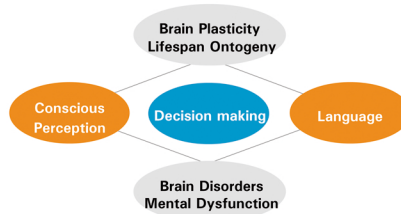
Berlin-Brandenburg Academy of Sciences and Humanities
Fraunhofer Institute für Rechnerarchitektur und Softwaretechnik (FIRST) Berlin
Max Delbrück Center for Molecular Medicine Berlin
MPI for Human Development Berlin
Max Planck Institute for Human Cognitive and Brain Leipzig
Physikalisch-Technische Bundesanstalt (PTB)
Institute for Advanced Studies Berlin
Centre for General Linguistics, Typology, and Universals Research Berlin

Research Topics

Topic 1

From Sensation to Conscious Perception

How brain processes give rise to conscious perception is a key question for the relationship between brain and mind. Specifically, the work is on characterizing the information flow from basic low-level sensory signal processing all the way up to conscious perception. This scope is made possible by the combination of research approaches, ranging from studies of sensory processing in animals to human neuroimaging studies directly addressing conscious and unconscious processing. Sensory signal processing, determinants of conscious and unconscious perception, neural encoding of conscious perception, and the neurophilosophy of phenomenal consciousness are among the major research topics studied.



Topic 4

Brain Plasticity and Lifespan Ontogeny

Given that plasticity extends into the adult life span, the Mind and Brain School is working on explicating the mechanisms with which contextualized experiences and learning, on the one hand, and brain plasticity, on the other hand, operate conjointly to shape the development of adaptive neurocognitive functions across the lifespan. The general research area is divided into four specific research projects: (i) charting lifespan gradients of behavioral and brain plasticity; (ii) delineating reciprocal interactions between various levels of developmental plasticity; (iii) investigating the effects of training or assistive technology in optimizing plasticity in childhood and old age; (iv) exploring person-specific, expertise-like variants of behavioral and brain plasticity.

Topic 2

Decision Making

Decision-making can be defined as the process of choosing an option or course of action from a set of alternatives. Recently, neuroscientists teamed up with psychologists and economists on the one hand and philosophers on the other to investigate decision-making processes in a more comprehensive fashion; thus the still nascent fields of neuroeconomics, neurophilosophy and neuroethics emerged. A more comprehensive understanding of how we make decisions will contribute to a better understanding of disorders of this function in clinical populations such as patients with brain lesions, drug and alcohol addiction, pathological gambling, schizophrenia and impulsive-aggressive behavior.

Topic 3

Language

Language is a paradigmatic topic for Mind and Brain studies at the crossroads of the cultural and social sciences, structural linguistics, behavioral studies, philosophy, and the neurosciences. The general objective of the language-related studies within the Berlin School of Mind and Brain is to analyze and systematically describe the cognitive and neurobiological correlates of linguistic subsystems. The interaction between philosophers of language will help in conceptualizing fundamental aspects of language research, and will allow students and researchers to interact and consequently learn from challenges to some of the implicit assumptions of neurobiologically based language research.

Topic 5

Brain Disorders and Mental Dysfunction

The phenomena of mental dysfunction and brain disorders are believed to be highly related - nevertheless, the details of the relation are still vague and unclear. Research within the Mind and Brain School focuses on notions of selective attention, executive control, affective states, memory, and adequate fears. All these functions are closely related to the individual experience of a coherent "self", to the ability for rational deliberation, decision making and agency. In addition to experimental work, we address conceptual issues raised by philosophers who question whether normative assumptions about mental faculties are open to empirical test.

Berlin School of Mind and Brain: Faculty

Bermpohl, Felix, Dr., Cognitive and affective neuroscience
Blankenburg, Felix, Dr., Somatosensory processing, (un)conscious perception
Brandt, Stephan A., PD Dr., Cognitive neuroscience and neurophysiology
Brecht, Michael, Prof. Dr., Neurophysiology
Curio, Gabriel, Prof. Dr., Psychophysiology, Brain-Computer Interface, neurology
Deter, Hans-Christian, Prof. Dr., Essential hypertension, emotions, cognitive and affective coping
Dietrich, Rainer, Prof. Dr., Psycholinguistics
Dirnagl, Ulrich, Prof. Dr., Regulation of cerebral blood flow and metabolism, cerebral ischemia
Einhäupl, Karl M., Prof. Dr., Cerebrovascular disorders
Endres, Matthias, Prof. Dr., Stroke research
Frensch, Peter A., Prof. Dr., Cognitive psychology
Friederici, Angela D., Prof. Dr., Neural basis of language, brain basis of language development
Gerhardt, Volker, Prof. Dr., Practical philosophy
Gigerenzer, Gerd, Prof. Dr., Adaptive behavior and cognition
Grüsser-Sinopoli, Sabine M., PD Dr., Addictive behavior, motivation, plasticity
Hammerstein, Peter, Prof. Dr., Theoretical and evolutionary biology, game theory, decision processes
Haynes, John-Dylan, Prof. Dr., Human cognitive neuroscience, neuroimaging, conscious and unconscious processing in perception and action
Heekeren, Hauke R., Dr., Neurocognition of Decision Making
Heinemann, Uwe, Prof. Dr., Experimental neurophysiology
Heinz, Andreas, Prof. Dr., Monoaminergic dysfunction in psychiatric disorders
Heinze, Hans-Jochen, Prof. Dr., Cognitive Neurology
Herz, Andreas V.M., Prof. Dr., Computational neuroscience and cellular biophysics
Herzel, Hans-Peter, Prof. Dr., Theoretical and systems biology, nonlinear dynamics: animal vocalization, signal transduction
Heuser, Isabella, Prof. Dr., Stress-related disorders, aging, dementia, psychopharmacology
Jacobs, Arthur M., Prof. Dr., Neurocognitive psychology
Kathmann, Norbert, Prof. Dr., Clinical psychology and neuropsychology
Kettenmann, Helmut., Prof. Dr., Cellular neurosciences
Klein, Wolfgang, Prof. Dr., Linguistics
Kliegel, Reinhold, Prof. Dr., Cognitive psychology

Klostermann, Fabian, PD Dr., Neurology, Parkinson's disease
Koch, Hans, Prof. Dr., Medical physics
Krika, Manfred, Prof. Dr., Semantics, pragmatics and syntax of natural language
Kröber, Hans-Ludwig, Prof. Dr., Criminality and mental disorder
Kronenberg, Golo, Dr., Affective disorders, regulation of cellular plasticity, neuronal stem cells
Kuhl, Dietmar F., Prof. Dr., Neurobiology
Li, Shu-Chen, PD Dr., Lifespan cognitive/neurocognitive development, computational modeling
Lindenberger, Ulman, Prof. Dr., Lifespan cognitive/neurocognitive development
Menzel, Rolf, Prof. Dr., Neurobiology
Müller, Olaf, Prof. Dr., Philosophy of language, philosophy of science, epistemology, metaphysics, ethics
Müller, Klaus-Robert, Prof. Dr., Data analysis and machine learning
Nitsch, Robert, Prof. Dr., Cell biology and neurobiology
Northoff, Georg, Prof. Dr., Functional neuroimaging and neuroethics/neurophilosophy
Obermayer, Klaus, Prof. Dr., Computational neuroscience, machine learning, analysis of neural data
Obrig, Hellmuth, PD Dr., Non-invasive optical imaging, Neuroscience, Neurology
Pauen, Michael, Prof. Dr., Philosophy of mind
Perler, Domimik, Prof. Dr., Philosophy of mind, history of philosophical psychology
Pompinò-Marschall, Bernd, Prof. Dr., Phonetics and phonology, speech motor control and perception
Rapp, Christof, Prof. Dr., Ancient and contemporary philosophy
Schmidt, Thomas, Prof. Dr., Practical philosophy; ethics.
Schmitz, Dietmar, Prof. Dr., Cellular and molecular neurobiology
Schoeller, Lael J., Dr., Adaptive behavior and cognition
Schubert, Torsten, PD Dr., Psychology and cognitive neuroscience
Schwintowski, Hans-Peter, Prof. Dr., Neurobiology of law, ethical decision-making, methods of law
Sommer, Werner, Prof. Dr., Cognitive neuroscience
Stoecker, Ralf, Prof. Dr., Applied ethics, philosophy of action
Ströhle, Andreas, PD Dr., Cognitive and behavioral neuroscience
Uhlig, Harald, Prof. Ph.D., Economics, Neuro-economics
Van der Meer, Elke E., Prof. Dr., Cognitive psychology
Villringer, Arno, Prof. Dr., Brain imaging and cognitive neurology