

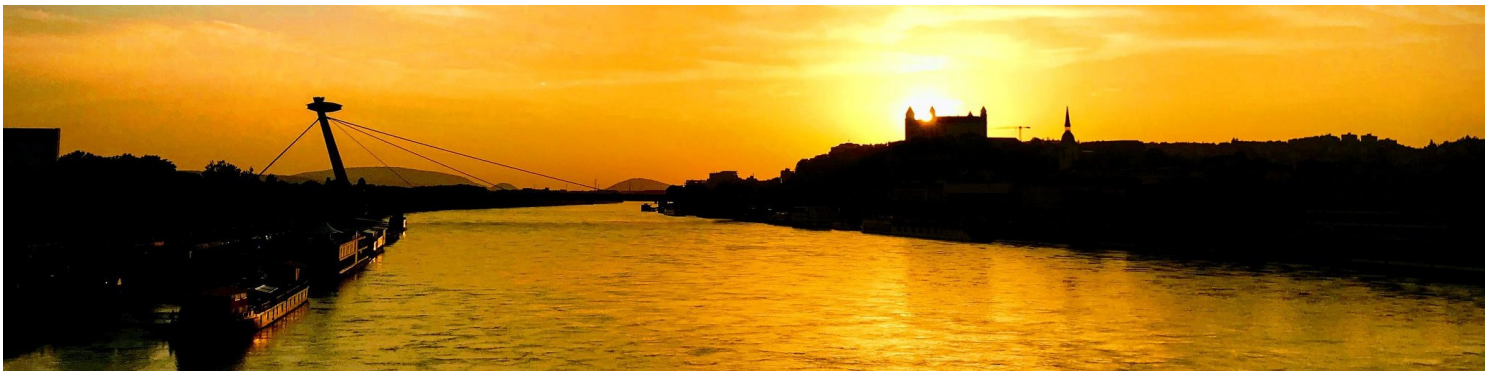
# Courses and research in cognitive science in Bratislava

Igor Farkaš

Centre for Cognitive Science

Faculty of Mathematics, Physics and Informatics  
Comenius University Bratislava

December 1, 2023



# A few facts from CogSci history in Bratislava

- Late 1990s – one-day seminars (prof. Kvasnička)
- 1st Slovak monography on cognitive science: Beňušková Ľ. et al.: *Quest for a Common Language in Cognitive Sciences* (in Slovak), Kalligram, 2000.
- 1st Slovak textbook - Rybár J., Beňušková Ľ., Kvasnička V. (eds.): *Kognitívne vedy* (Cognitive Sciences), Kalligram Bratislava 2002.
- Rybár J., Kvasnička V., Farkaš I. (eds.): *Jazyk a kognícia* (Language and Cognition), Kalligram Bratislava 2005.
- Kvasnička V., Trebatický P., Pospichal J., Kelemen J. (eds). *Myseľ, inteligencia a život* (Mind, intelligence and life). STU in Bratislava, 2007.
- Kvasnička V., Kelemen J., Pospichal J. (eds). *Modely mysle* (Models of the mind). Európa Bratislava, 2008
  
- Annual Czech-Slovak conference *Cognition and Artificial Life* (since 2001)
- CogSci programme at Comenius University – since 2007, in English since 2016
- Slovak cogsci history also on [wiki \(kognitívna veda\)](#)

# Centre for Cognitive Science

## People at the faculty (FMPI)

- Farkaš Igor – cog. robotics, neural nets, etc.
- Takáč Martin – cognitive modeling, etc.
- Malinovská Kristína – neural networks
- Gál Tomáš – ethics, AI, ...
- Slavíčková Mária – math for cogsci
- Zlatoš Pavol – logic for cogsci
- PhD students: M. Fandl, I. Bečková, Š. Pócoš, ...

## Other faculties of Comenius University

- Bakoš Ján, Dr., Faculty of Medicine, cognition and neuroendocrinology
- Višňovský Emil, prof., Faculty of Philosophy, philosophy of action, of AI
- Cséfalvay Zsolt, prof., Faculty of Education, communication disorder

## Slovak Academy of Sciences (SAS), Bratislava

- Rosipal Roman – Inst. of Measurement Science, EEG/BCI, cognitive neuroscience
- Marko Martin, Riečanský Igor – Inst. of Normal and Pathological Physiology
- Šrol Jakub, Čavojová Vladimíra – Inst. of Exper. Psychology
- Urban Kamila, Poslon Xenia – Inst. for Research in Social Communication

## Other universities

- Sýkora Peter, prof., UCM Trnava, bioethics
- Tomašková Silvia, prof., Nitra, philosophy of mind, consciousness
- Špajdel Marián, doc., Trnava, cog. neurosci.

# cogsci.fmph.uniba.sk

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Centre for Cognitive Science

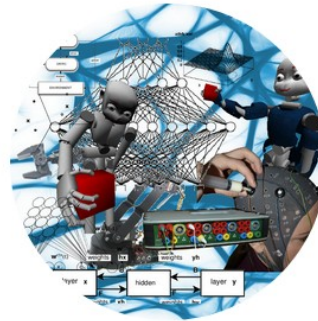


Middle European  
interdisciplinary  
master's programme in  
Cognitive Science



## Master programme

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## Research

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[CNC](#) Research Group  
Cognitive Science [Seminar](#)  
[Technical Reports](#) in Cognitive Science



## Community

[SSKV](#): Slovak Society for Cognitive Science  
[MEi:CogSci Bratislava](#) on [Facebook](#)  
Students and alumni group on [Facebook](#)  
Cognitive Science [Blog](#)  
[MEi:CogSci Alumni](#)

Igor



Martin



Kristína



# The base of MEi:CogSci programme

## DEPARTMENT OF APPLIED INFORMATICS



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Page Discussion

View Edit History Actions

Tools



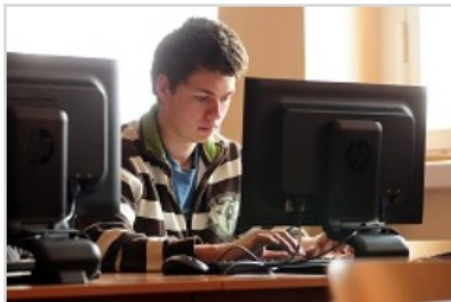
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### EDUCATION

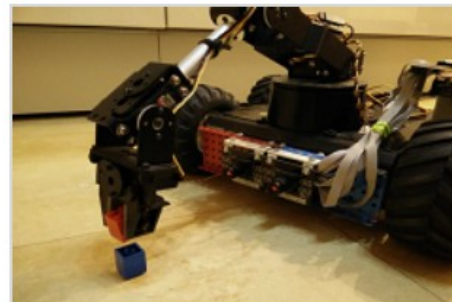
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[Master program in Cognitive Science](#)

[Academic support center](#)

[Theses](#)



### RESEARCH

[Computer Graphics and Vision](#)

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[Theory of Programming](#)

[Projects](#)

[Conferences and Events](#)

[Seminars](#)



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v piatok



V posluchárni A prebehla vernisáž obrazu Numeri Nexum, ktorého autorkou je naša študentka a umelkyňa Alexandra Dyalee . Toto dielo bolo publikované v medzinárodnom magazíne konceptuálneho umenia ArtistCloseUp (03.2023), a v apríli 2023 bola jeho tlačaná reprodukcia súčasťou predajnej výstavy AUTISTI-ARTISTI v bratislavskom

# Courses in Bratislava

- New Trends in Cognitive Science (obligatory) - two courses
  - Cognitive Semantics ... (M. Takáč)
  - Deep Learning and Cognition (I. Farkaš)
- Elective courses
  - Mathematics for Cognitive Science (M. Lucká)
  - Introduction to Programming (in Python) (K. Malinovská)
  - Practical Seminar in Robotics (P. Petrovič)
  - Philosophy of AI (E. Višňovský)
  - ...
- See the programme [curriculum](#)
- [Catalogue](#) of Erasmus courses at the faculty

# Our research in AI and CogSci

Cognition and Neural Computation group

MEi:CogSci



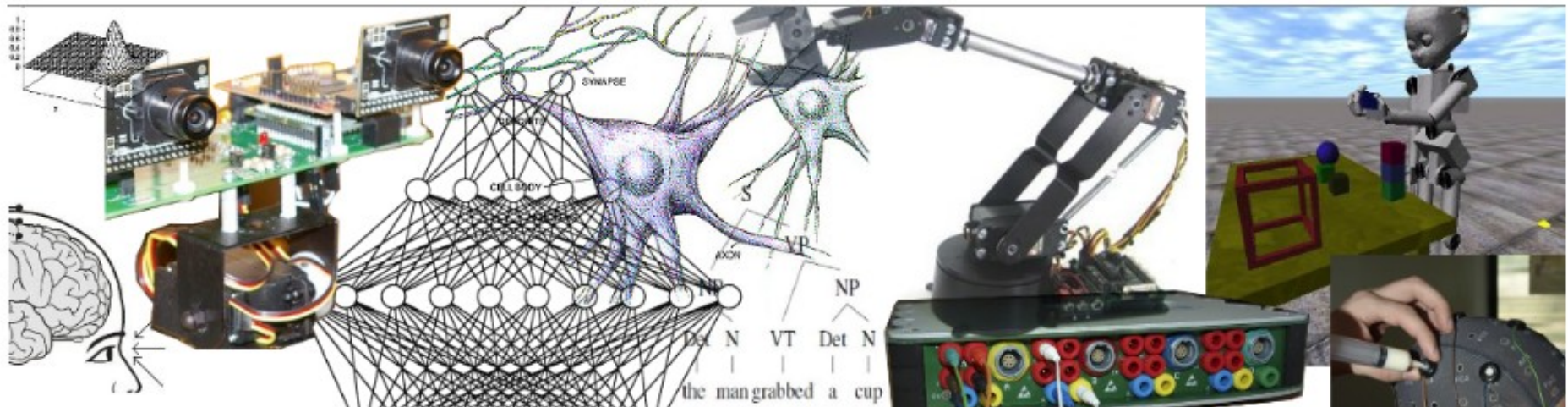
Home

People

Research

Publications

CNC Seminar



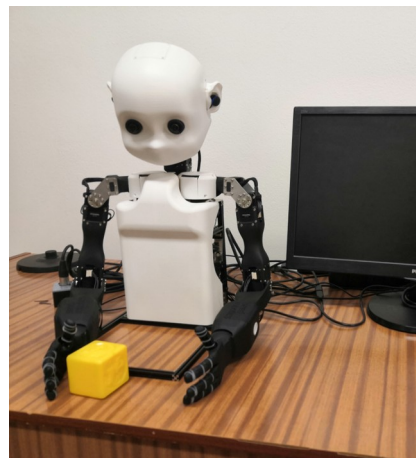
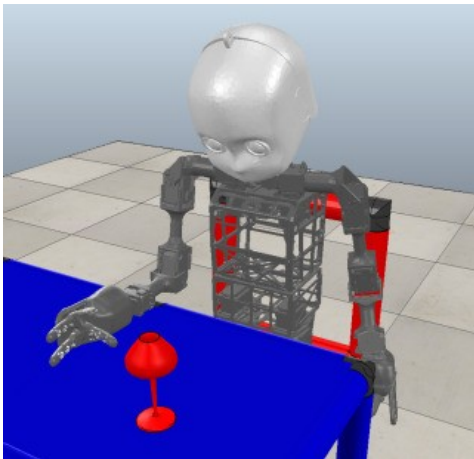
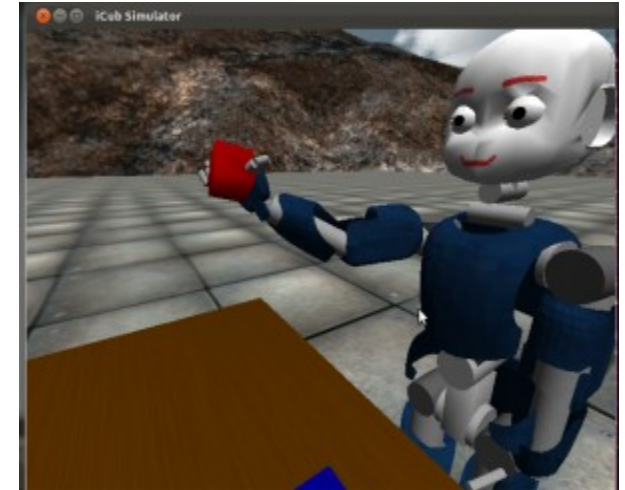
## Research:

- computational modeling – of cognitive modeling (with neural networks), cognitive robotics, deep networks, computational analysis of neural network models
- experimental research – human-robot interaction, virtual reality



# Computational modeling (incl. cog. robotics)

- Machine learning based on artificial neural networks – for vision, motor learning, memory, language, ...
- robotic simulators: e.g. iCub, Open AI gym and robots: Jupiter & NICO,
- Human-Robot Interaction (EU project)



<https://terais.eu>



# Computational and cognitive neuroscience

Slovak Academy of Sciences  
Institute of Measurement Science

[Roman Rosipal, DrSc](#)

- applied machine learning
- EEG/ERP → BCI
- sleep, neural correlates of working memory, vigilance, drowsiness and fatigue monitoring
- Neurorehabilitation in VR (EU project - ReHaB)



# Behavioral & cognitive neuroscience

Slovak Academy of Sciences, Bratislava  
Institute of Normal and Pathological Physiology

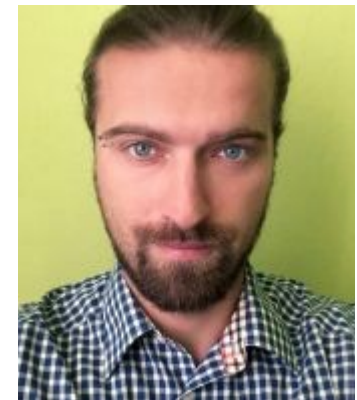
[MUDr. Igor Riečanský, PhD.](#)

- Behavioral neuroscience lab
- brain mechanisms of mental processes
- cognitive neuroscience, psychology, psychiatry



[Mgr. Martin Marko, PhD.](#)

- memory and semantic networks
- transcranial direct/alternating current stimulation (tDCS, tACS)



# Developmental neuroscience

Slovak Academy of Sciences, Bratislava  
Department of Neuroscience  
Biomedical Research Center  
&  
Institute of Physiology, Faculty of Medicine  
Comenius University in Bratislava



[Doc. RNDr. Ján Bakoš, PhD.](#)

- Neuroscience and neuroendocrinology
- oxytocin, effect of neuropeptides on CNS
- neurobiology and brain physiology
- neuroplasticity

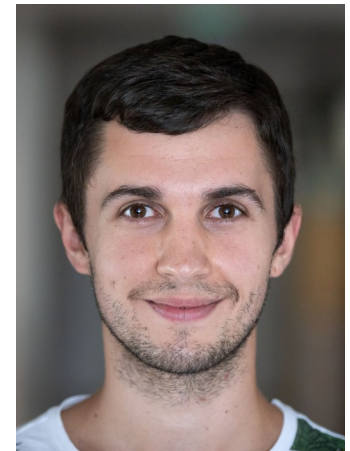
# Experimental psychology

Slovak Academy of Sciences, Bratislava  
Institute of Experimental Psychology

[Dr. Vladimíra Kurincová Čavojová](#)

[Dr. Jakub Šrol](#)

- scientific reasoning, intuitive reasoning
- cognitive biases
- epistemically suspect beliefs
- climate change beliefs



# Social psychology and cognition

Slovak Academy of Sciences, Bratislava  
Institute for Research in Social Communications

[Kamila Urban, PhD](#)

- developmental psychology, metacognition, creativity, self-regulated learning



[Xenia D. Poslon, PhD](#)

- social psychology, inter-group relations, stereotypes and prejudice
- social cognition, political psychology



# Philosophy (of anything :-)

Comenius University Bratislava

Faculty of Philosophy

[Prof. Emil Višňovský](#)



- humanism, technology, modern society
- philosophy of action, of AI, of virtual reality

# Philosophy of mind

Constantine the Philosopher University, Nitra  
Department of Philosophy

[Prof. Silvia Tomašková](#)



- philosophy of mind, mind/body problem
- problem of consciousness, the self
- metaphorical language of the "inner self"
- mind in cognitive science



# Useful links

- Program director: **Igor Farkaš**, <http://cogsci.fmph.uniba.sk/~farkas/>
- Program coordinator for incoming students and program tutor: **Martin Takáč**, <http://cogsci.fmph.uniba.sk/~takac/>
- Information for incoming students:
  - <http://cogsci.fmph.uniba.sk/meicogsciba/?action=mobilitystudents>
- Erasmus contact person at Faculty: patrik.kmetek@fmph.uniba.sk
- CogSci programme [curriculum](#) in Bratislava
- [Catalogue](#) of Erasmus courses provided by the Faculty (MatFyz)

# Hlavné námestie in Bratislava



Thank you for your attention!