

# **Courses and research in cognitive science in Bratislava**

Centre for Cognitive Science

Faculty of Mathematics, Physics and Informatics  
Comenius University in Bratislava

December 10th, 2021



# 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 – AI and cogsci
- Takáč Martin – AI and cogsci
- Malinovská Kristína – AI & cog. robotics
- Cimrová Barbora – cogsci, EEG
- Gál Tomáš – ethics, AI, ...
- Slavíčková Mária – math for cogsci
- Zlatoš Pavol – logic for cogsci
- PhD students: M. Fandl, M. Pecháč, E. Hamerlik, ...

## Other faculties of Comenius University

- Ostatníková Daniela, prof., Faculty of Medicine, hormones, cognition & autism
- 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
- Riečanský Igor, Marko Martin – Inst. of Normal and Pathological Physiology
- Čavojová Vladimíra, Šrol Jakub – Inst. of Exper. Psychology
- Urban Kamila, Poslon Xenia – Inst. for Research in Social Communication

## Other universities

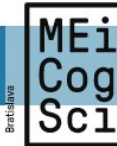
- Sýkora Peter, prof., UCM Trnava, bioethics
- Tomašková Silvia, prof., Nitra, philosophy of mind, consciousness
- Špajdel Marián, doc., Trnava, cog. neurosci.



# cogsci.fmph.uniba.sk

[Home](#) [People](#) [Contact](#)

Centre for Cognitive Science

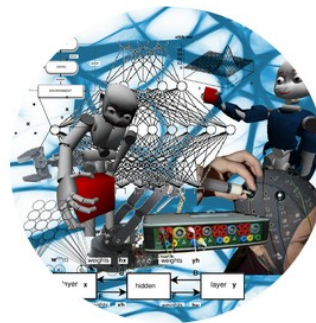


Middle European  
interdisciplinary  
master's programme in  
Cognitive Science



## Master programme

[Apply](#) for the programme  
[Students](#) of CogSci at Comenius University  
Incoming [Mobility](#) Students  
MEi:CogSci Bratislava [Homepage](#)



## Research

[People](#) of Centre for Cognitive Science  
[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



Barbora



# The base of MEi:CogSci programme



Bratislava Knowledge September 2021

**BRATISLAVA  
KNOWLEDGE SEPTEMBER  
2021**

SEP 14–24 2021

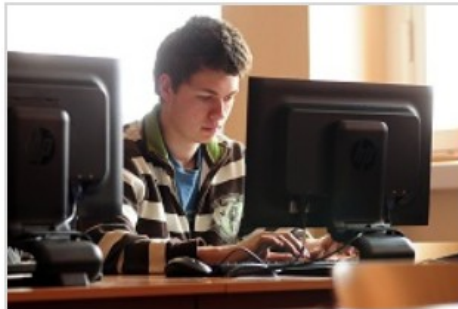


**COGNITION AND  
ARTIFICIAL LIFE 2019**

MAY 29–31 2019



[More news >](#)



## EDUCATION

[Bachelor program in  
Applied Informatics](#)

[Master program in  
Applied Informatics](#)

[Master program in  
Cognitive Science](#)

[Academic support center](#)

[Theses](#)



## RESEARCH

[Computer Graphics and Vision](#)

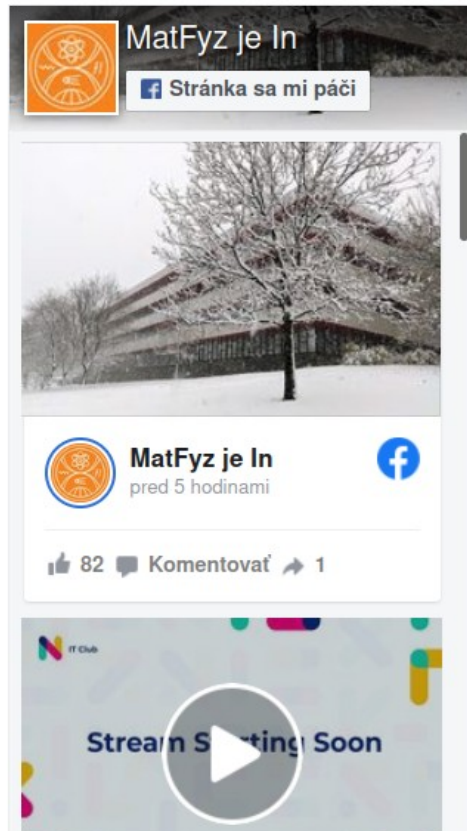
[Artificial Intelligence and  
Computational Modelling](#)

[Theory of Programming](#)

[Projects](#)

[Conferences and Events](#)

[Seminars](#)



# Courses in Bratislava

- New Trends in Cognitive Science (obligatory)
  - Cognitive semantics (M. Takáč)
  - Modern trends in machine learning / Cognitive AI (I. Farkaš)
- Elective courses
  - Mathematics for Cognitive Science (M. Slavíčková)
  - Introduction to Programming (in Python) (K. Malinovská)
  - Introduction to Robotics (P. Petrovič)
  - Philosophy of AI (E. Višňovský)
  - ...
- See the [curriculum](#)



# Our research in AI and CogSci

Cognition and Neural Computation group

MEi:CogSci



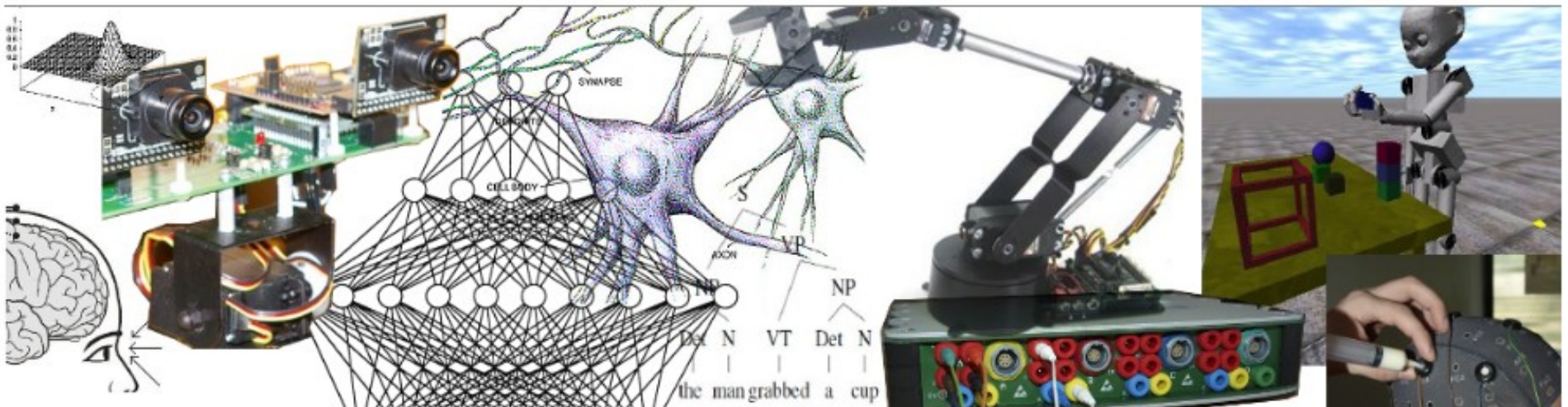
Home

People

Research

Publications

CNC Seminar



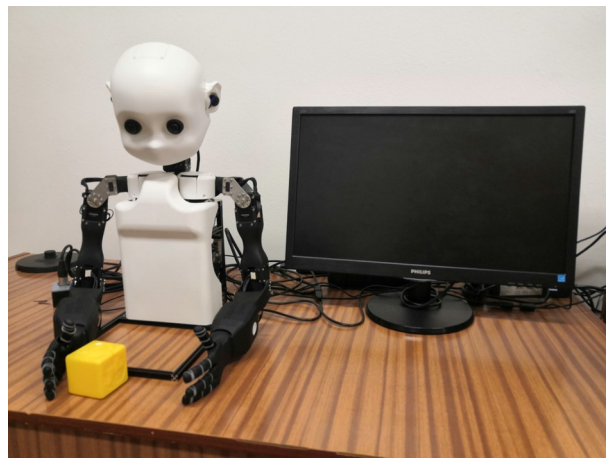
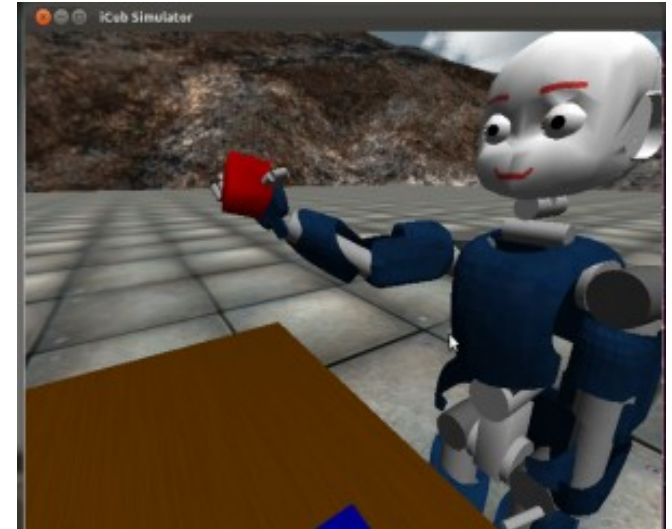
## Research:

- computational modeling – of cognitive modeling (with neural networks), cognitive robotics, deep networks, computational analysis of neural network models
- experimental research – EEG/BCI, mixed reality



# Computational modeling (incl. robotics)

- Machine learning based on artificial neural networks – for vision, motor learning, memory, language, ...
- robotic simulators: e.g. iCub, Coppelia Robotics, Open AI gym and robots: Jupiter & Nico, human-robot interaction



# Opportunities for experimental research

## *g.USBamp* – USB Biosignal Amplifier



- multi-modal amplifier system  
EEG, ECG, EMG, EOG, ...  
respiration  
other sensors
- simultaneous sample and hold  
for all channels
- 16 analog inputs with 24 Bit, 38.4 kHz  
per channel
- can be stacked for 32, 48, 64 channels
- fully DC coupled
- USB 2.0 interface
- FDA and CE approved



- New additions:
  - head-mounted eye-tracker
  - mixed reality glasses

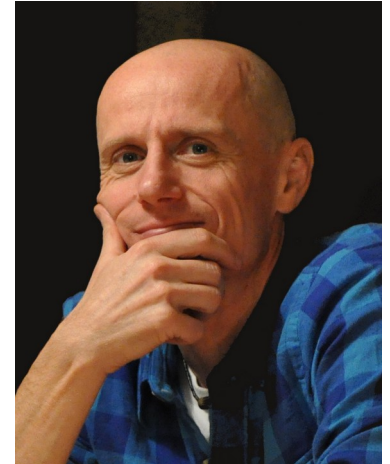


# Computational and cognitive neuroscience

Slovak Academy of Sciences

Institute of Measurement Science

Roman Rosipal, PhD



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



# Behavioral & cognitive neuroscience

Slovak Academy of Sciences, Bratislava

Institute of Normal and Pathological Physiology

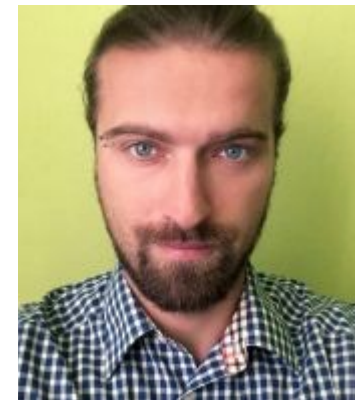
MUDr. Igor Riečanský, PhD.

- brain mechanisms of mental processes
- cognitive neuroscience, biological psychology, psychiatry



Mgr. Martin Marko, PhD.

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



# Experimental psychology

Slovak Academy of Sciences, Bratislava

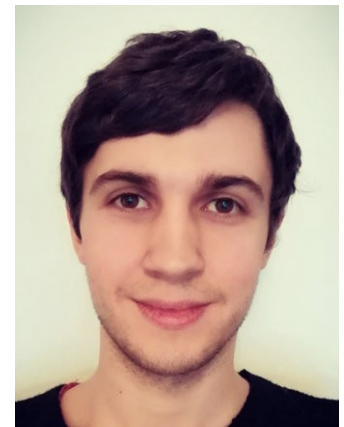
Institute of Experimental Psychology

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

Dr. Kamila Urban

(Dr.) Xenia D. Poslon



- developmental psychology, metacognition, self-regulated learning
- social psychology, inter-group relations, stereotypes and prejudice
- social cognition, political psychology





# Philosophy (of anything :-)

Comenius University in 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

# How to get to your project

- 1) Ideally, you choose a project offered at the host uni and agree on a LC with your supervisor.
- 2) If you have an idea about the project, but it is not offered, try to find a competent supervisor who may be willing to work with you.
- 3) If you have an idea about your preferred supervisor (given his/her expertise), contact him/her – you may converge to a project that you both will agree on.
- 4) If none of the above is the case, it may be difficult. Try to reconsider your view :-)

Good luck with your choice! We are looking forward to you!