

# Courses and research in cognitive science in Bratislava

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# A few facts from CogSci history in Bratislava

- 1st Slovak monography related to cognitive science: Beňušková L. et al.: *Quest for a Common Language in Cognitive Sciences* (in Slovak), Kalligram, 2000.
- 1st Slovak textbook Rybár J. et al. (eds.): *Kognitívne vedy* (Cognitive Sciences), Kalligram Bratislava 2002.
- Rybár et al. (eds.): *Jazyk a kognícia* (Language and Cognition), Kalligram Bratislava 2005.
- Kvasnička V. et al (eds). *Mysel', inteligencia a život* (Mind, intelligence and life). STU in Bratislava, 2007.
- Kvasnička V. et al (eds). *Modeley mysle* (Models of the mind). Európa Bratislava, 2008
- Annual Czech-Slovak conference *Cognition and Artificial Life* (since 2001)
- CogSci programme at Comenius University is up and running
- Successful re-accreditation in 2015!

# Centre for Cognitive Science

## People at the faculty (FMP)

- Farkaš Igor (faculty) – AI and cogsci
- Takáč Martin (faculty) – AI and cogsci
- Rybár Ján (faculty) – psychology
- Kamhal Dezider (faculty) – philosophy
- Zlatoš Pavol prof. (faculty) – logic
- Cimrová Barbora (faculty) – cogsci, EEG
- Kuzma Tomáš (PhD student)
- Gergel' Peter (PhD student)

## Other faculties of Comenius University

- Cséfalvay Zsolt, prof., aphasia, dementia  
Faculty of Education
- Ostatníková Daniela, prof., hormones & cognition, Faculty of Medicine
- Višňovský Emil, prof., Faculty of Philosophy

## Slovak Academy of Sciences (SAS), Bratislava

- Bašnáková Jana, Inst. of Experimental Psychology & Psycholinguistics, Nijmegen
- Čavojová Vladimíra, Dr., Inst. of Exper. Psychology, decision making, emotions
- Riečanský Igor, Dr., Inst. of Normal and Pathological Physiology, cog. neuroscience
- Rosipal Roman, Dr., Inst. of Measurement Science, machine learning, cognitive neuroscience, BCI

## Other universities

- Sýkora Peter, prof., UCM Trnava, bioethics
- Gáliková Silvia, prof., Trnava, consciousness
- Gál Tomáš, PhD., altered states of mind

# Slovak Society for Cognitive Science

Kontakt



Centrum pre KV

MEi:CogSci



## Slovenská spoločnosť pre kognitívnu vedu

### O nás

Slovenská spoločnosť pre kognitívnu vedu (SSKV) je občianskym združením, ktoré bolo začiatkom roka 2015 založené v Centre pre kognitívnu vedu na Fakulte matematiky, fyziky a informatiky Univerzity Komenského v Bratislave.

### Poslanie

Základným poslaním SSKV je všeestranne podporovať rozvoj kognitívnej vedy na Slovensku a zároveň vytvárať podmienky pre medzinárodnú spoluprácu s dôrazom na stredoeurópsky región.

[Stanovy SSKV](#)

### Predsedníctvo

- **prof. Ing. Igor Farkaš, PhD. (predseda)**, Centrum pre kognitívnu vedu, KAI, FMFI UK, Bratislava
- doc. PhDr. Ján Rybár, PhD., Centrum pre kognitívnu vedu, KAI, FMFI UK, Bratislava
- RNDr. Martin Takáč, PhD., Centrum pre kognitívnu vedu, KAI, FMFI UK, Bratislava



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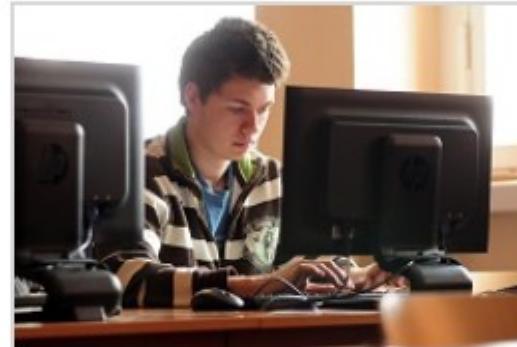
# DEPARTMENT OF APPLIED INFORMATICS



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NEWLY RE-ACCREDITED STUDY PROGRAMMES  
AUGUST 26, 2015



## EDUCATION

[Bachelor program in Applied Informatics](#)

[Master program in Applied Informatics](#)

[Master program in Cognitive Science](#)

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## RESEARCH

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[Artificial Intelligence and Computational Modelling](#)

[Theory of Programming](#)

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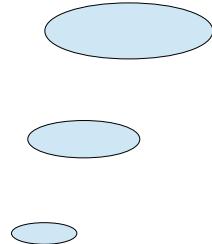
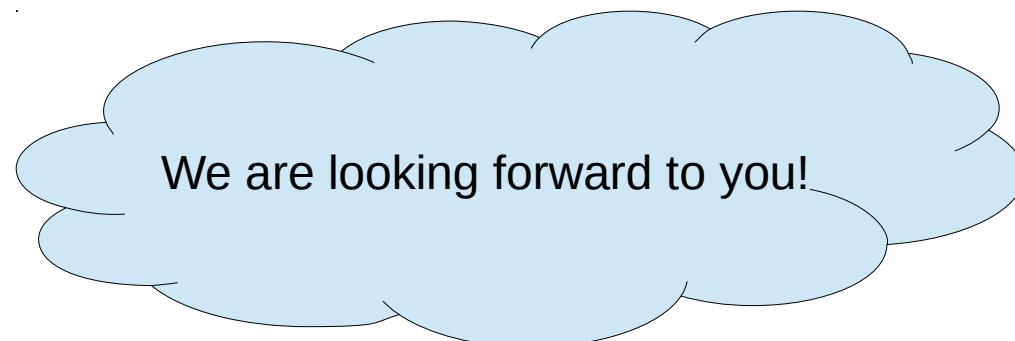
SPRING CONFERENCE ON COMPUTER GRAPHICS  
MAY 1ST - 3RD 2013



[More news...](#)

# New Trends in Cognitive Science

- Formed by two courses: (each worth 5 ECTS)
- Grounded Cognition (Igor Farkaš)
- Cognitive Semantics and Cognitive Theory of Representation (Martin Takáč)



# Additional courses in English

- Introduction to Mathematics
- Introduction to Programming (in Matlab)
- Introduction to Computational Intelligence
- Theories of Consciousness
- Philosophy of AI
- And other courses...
- See the curriculum at

[http://dai.fmph.uniba.sk/w/Master\\_program\\_in\\_Cognitive\\_Science/en](http://dai.fmph.uniba.sk/w/Master_program_in_Cognitive_Science/en)

# Our research in AI and CogSci

Cognition and Neural Computation group



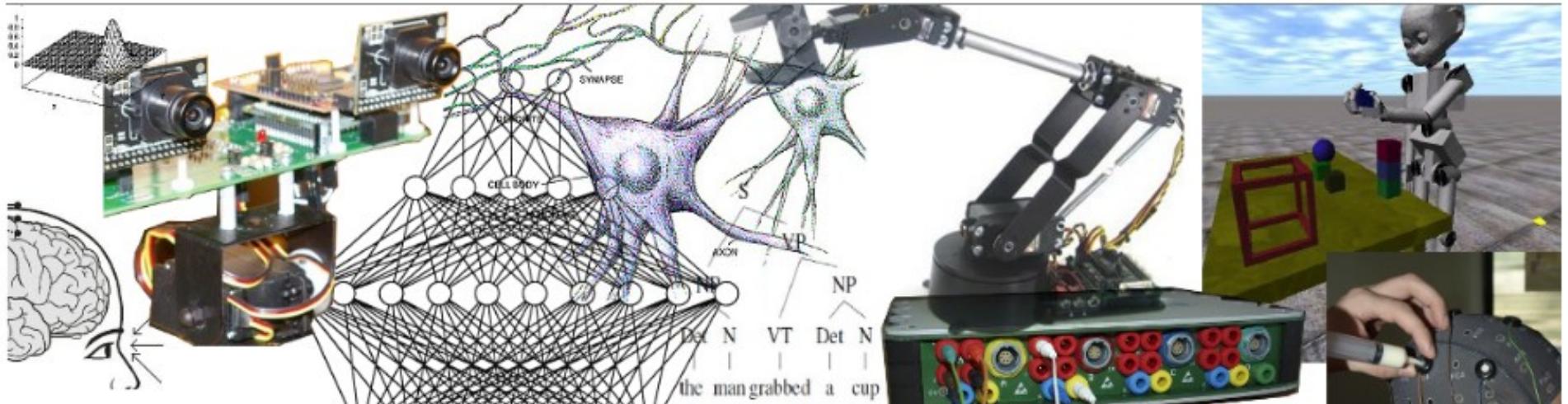
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CNC Seminar



# CNC research in AI and CogSci

- Computational modeling / theoretical research
  - Project: From sensory-motor processes to higher cognition: Computational modeling of mental development in an embodied cognitive agent
  - Slovak Grant Agency for Science (2014-2016, Farkaš et al.)
- Experimental research (with EEG)
  - Joint project: Brain-computer interface with robot-assisted training for rehabilitation
  - With Slovak Academy of Sciences (R. Rosipal, PI) (2017-2017)
- Researchers - Igor Farkaš, Martin Takáč, Barbora Cimrová, Ján Rybár
- Doctoral students - Tomáš Kuzma, Peter Gergel'
- Master students - of cognitive science, and (applied) informatics

# iCub simulator

- developed within EU project RobotCub
- publicly available since 2007
- licensed under GPL, it has been designed to reproduce, as accurately as possible, the physics and the dynamics of the robot and its environment
- uses Open Dynamics Engine (ODE) for simulating rigid bodies and the collision detection algorithms to compute the physical interaction with objects
- Useful for robotic experiments

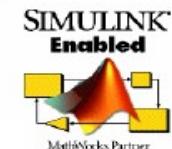


# Our EEG measurement system

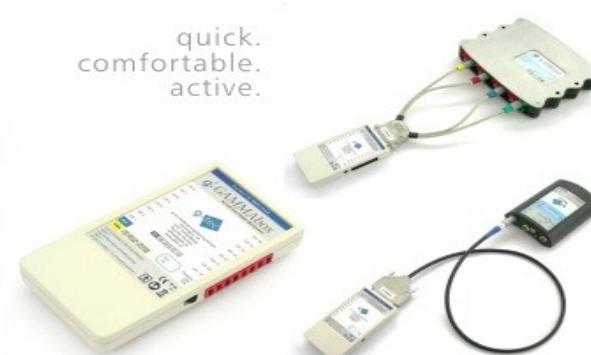
## *g.USBamp* – USB Biosignal Amplifier



- 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



quick.  
comfortable.  
active.



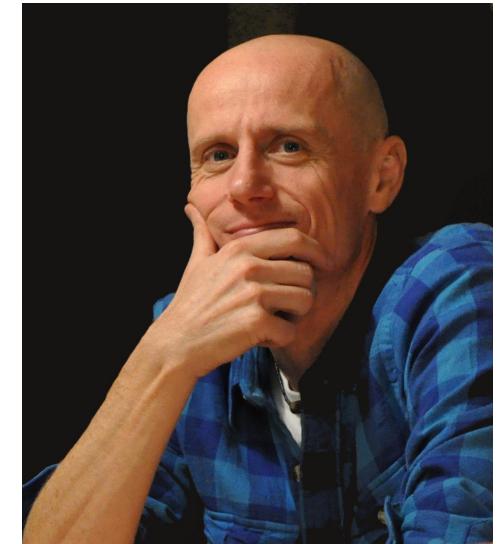
(donation of Humboldt foundation)

# Computational and cognitive neuroscience

- Roman Rosipal, PhD
- Institute of Measurement Science, Slovak Academy of Sciences

## Research interests:

- computational and cognitive neuroscience
- electrophysiological data analysis (EEG, EOG, EMG, ECG); event-related potentials; sleep process modelling;
- study of cognitive fatigue; brain-computer interfaces; vigilance, drowsiness and fatigue monitoring



# Experimental psychology

- Dr. Vladimíra Čavojová
- Institute of Experimental Psychology, Slovak Academy of Sciences
- **Research interests:** Rationality, decision making, emotions



# Philosophy and AI

- Prof. Emil Višňovský
- Faculty of Philosophy, Comenius Uni in Bratislava (CUB)
- Research interests:
  - social and moral norms,
  - philosophy of action,
  - philosophy of artificial intelligence



# Philosophy of mind

- Prof. Silvia Gáliková
- Institute of Philosophy, Slovak Academy of Sciences
- **Research interests:** philosophy of science, philosophy of mind, consciousness



# Cognitive Neuroscience

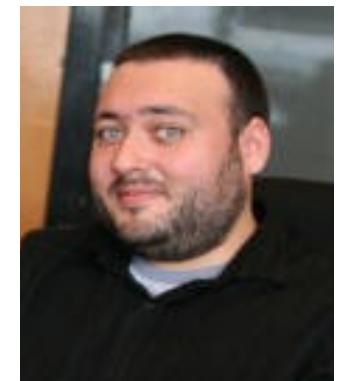
- MUDr. Igor Riečanský, PhD.
- Institute of Normal and Pathological Physiology  
Slovak Academy of Sciences, Bratislava
- & Institute of Psychology, Uni Vienna



- **Research interests:**
  - brain mechanisms of mental processes (mind-brain problem, attention, perception),
  - cognitive neuroscience and neuropsychiatry

# Education / Religion

- Ing. PhDr. Tomáš Gál, PhD
- Center for Information Technologies, Comenius University
- Research interests:
  - special education,
  - religiosity and cognition,
  - altered states of mind



# Thank you for your attention



Bratislava can't wait to hear from you!