Mathematics and Computer Science in Practice: Potential and Reality
Matematika a informatika v praxi: možnosti a realita

An interdisciplinary workshop held at the

Institute of Information Theory and Automation CAS

Pod Vodárenskou věží 4, 182 08, Praha 8, Czech Republic

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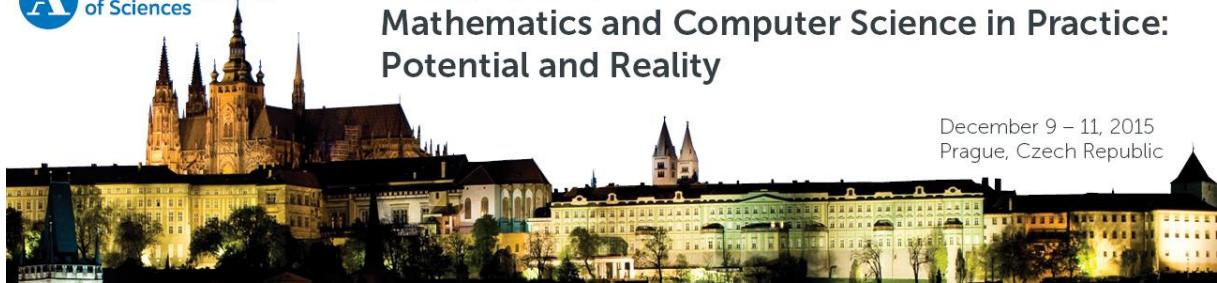
December 9 - 11, 2015
Prague, Czech Republic

Technological development in the last centuries would not have been possible without a parallel development in mathematical sciences stimulated by social demand. Mathematics as logical system has proven efficient in establishing links between perception, cognition, and understanding complex processes. It operates with models of reality, and helps to decide whether the models are adequate or not by drawing logical consequences of the model assumptions and discovering hidden structures.

The aim of the workshop is to discuss about the productive power of mathematics in real world applications. Experts from economically active companies, universities, and specialized research institutions will share their positive and negative experience about how mathematics has been, can be, ought to be, and should not be used to enhance social and economic progress in the 21th century. Special attention will be paid to examples of good and bad practice in applied mathematics. Sharing success stories may instigate further cooperation between academia and industry.

Potential and reality

The workshop will consist of invited lectures and round table discussions. Participants are encouraged to take active part in the discussions. The workshop is bi-lingual Czech and English with simultaneous translation.

ORGANIZERS

Jan Flusser, Institute of Information Theory and Automation CAS

Michal Chytil, Institute of Computer Science CAS

Pavel Krejčí and **Jiří Rákosník**, Institute of Mathematics CAS

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PROGRAMME

Wednesday, December 9, 2015

Morning Session – Chair: Pavel Krejčí

09:00, Registration

10:00, Opening – **Jan Flusser**

10:15**, Mihai Dimian**, Stefan cel Mare University, Suceava, Romania: Analysis of noise-driven phenomena in hysteretic systems with applications in data storage technology and digital signal processing (Keynote lecture).

11:15, Coffee break

11:45, **Lidmila Fusková**, Diribet s.r.o., Beroun, Czech Republic: Pauca sed matura.

12:45, Lunch

Early Afternoon Session – Chair: Jiří Rákosník

14:00, **Dietmar Hömberg**, TU Berlin and WIAS Berlin, Germany: The Digital Factory – a perspective for a closer cooperationbetween Math and Industry.

14:30, **Harbir Lamba**, George Mason University, Fairfax, Virginia, USA: Economics, finance and far-from-equilibrium dynamics.

15:00, Coffee break

Late afternoon Session – Chair: Lidmila Fusková

15:30, **Jaroslav Staněk**, Doosan Bobcat Engineering s.r.o., Dobříš, Czech Republic: Mathematics and Mechanical Engineering: The symbiosis and the parasitism.

16:00, **Rudolf Poledne**, Institute of Clinical and Experimental Medicine (IKEM), Prague, Czech Republic: Co může matematický model odhalit z biomedicínských dat (What a mathematical model can discover in biomedical data – lecture given in Czech).

Thursday, December 10

Morning Session – Chair: Pavel Krejčí

10:15, **Klaus Kuhnen**, Robert Bosch GmbH, Stuttgart, Germany: The role of mathematical modeling in piezoelectric micro-push motor design (Keynote lecture).

11:15, Coffee break

11:45, **Jiří Vomlel**, Institute of Information Theory and Automation, Czech Academy of Sciences, Prague: Jak úsporně řídit auto (How to drive a car economically – lecture given in Czech).

12:45, Lunch

Afternoon Session - Chair: Jan Flusser

14:00, **Pavel Šebor**, SCS Software: Virtuální světy (Virtual worlds – lecture given in Czech).

14:30, **Filip Šroubek**, Institute of Information Theory and Automation, Czech Academy of Sciences, Prague: Digitální video za hranicemi rozlišení kamery (Digital video beyond the camera resolution – lecture given in Czech).

15:00, **Michal Haindl**, Institute of Information Theory and Automation, Czech Academy of Sciences, Prague: Realistické vizuální modelování povrchu materiálu (Realistic visual modelling of the material surface – lecture given in Czech).

15:30, Coffee break

16:00, Round table discussions

18:30, Conference dinner

Proposed topics for Round Table Discussions:

Barriers between science and practice – reality or prejudice?

Which Mathematics and Computer Science should be taught at technical universities today in order to be applied tomorrow?

Friday, December 11

Morning Session – Chair: Michal Chytil

10:00, **Martin Vejmelka**, Institute of Computer Science, Czech Academy of Sciences, Prague: Kulturní rozdíly mezi výzkumem v praxi a ve vědě (Cultural friction between the research in practice and science – Keynote lecture given in Czech).

11:00, **Ladislav Kunc**, IBM Research: Konvoluční neuronové sítě pro klasifikaci textu (Convolution neural networks for text classification – lecture given in Czech).

11:30, Closing – **Pavel Krejčí**

11:45, Lunch

SECRETARIAT OF THE WORKSHOP

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