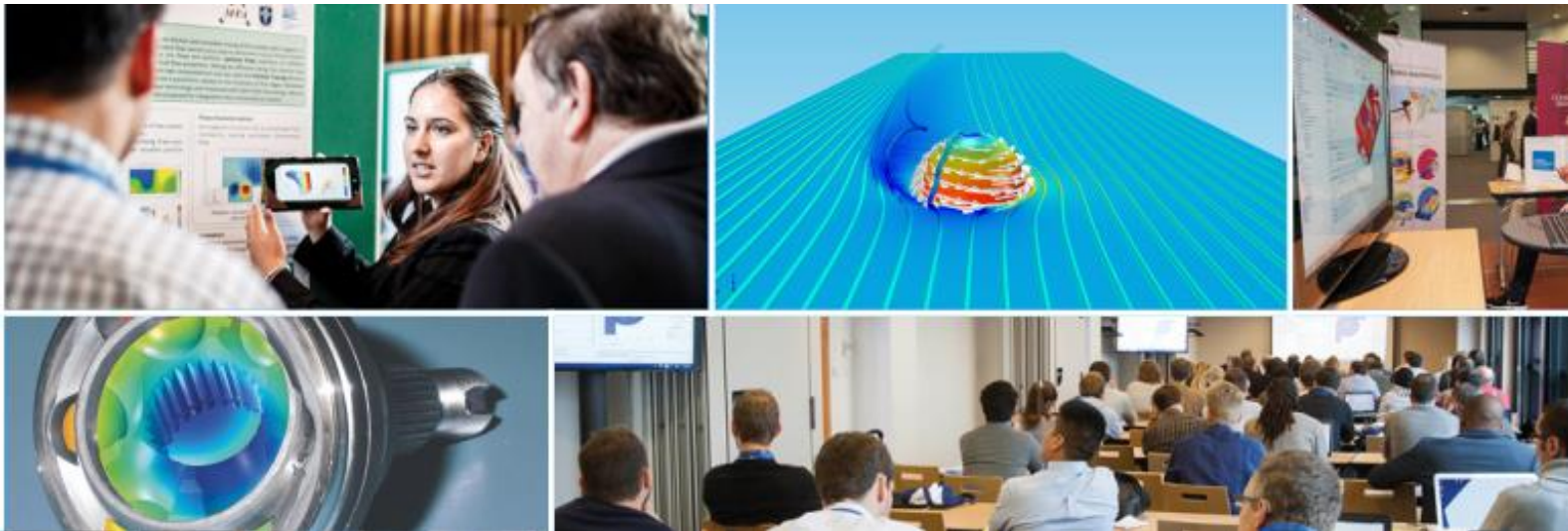


COMSOL Multiphysics 2024

8th annual conference

Lednice 23. - 24. 5. 2024



Keynote Speakers



Nancy Bannach

Developer, COMSOL Sweden

Focus on porous media flow and transport, CFD, Chemical engineering



Arpad Forberger

Application engineer, SciEngineer Hungary

Technical computing, model-based design and multiphysics



Adam Obrusník

Co-founder and CEO, PlasmaSolve Czech Rep.

Head of consulting - plasma physics and chemistry, material engineering



Kush Patel

Senior Research Engineer, MTC UK

Computational fluid dynamics and structural analysis

on-line

Our Team



Martin Kožíšek
Product Manager
HUMUSOFT s.r.o.



Martin Foltin
Country Manager SK
HUMUSOFT s.r.o.



Tomáš Vrbata
Application Engineer
HUMUSOFT s.r.o.



Matouš Lorenc
Application Engineer
HUMUSOFT s.r.o.

Our Team



Anna Tocháčková
MATLAB Appl. Engineer
HUMUSOFT s.r.o.



Michaela Švecová
Sales Assistant
HUMUSOFT s.r.o.



Jiří Šusta
Studio Master
HUMUSOFT s.r.o.



Petr Byron
Director
HUMUSOFT s.r.o.

Conference Topics

Deep Neural Networks in Simulation Industry

Heat and Moisture Transport in Porous Media

Battery and Fuel Cell Development

Computational Fluid Dynamics CFD

Electromagnetic Compatibility Analysis EMC

Virtual Factory

Modelling of Lorentz Force in Solids and Fluids

Advanced Simulations in Plasma Industry

Biomedical Engineering Session

Schedule Thursday 23.5.

- 9:40 **Humusoft collaboration: CFD Simulation for The Efficient H2S Removal**
Martin Kožíšek, HUMUSOFT, Marketa Andraides, UCT in Prague
- 10:00 **Keynote: Heat and Moisture Transport in Porous Media**
Nancy Bannach, COMSOL
- 11:00 **Coffee Break, Poster Session A**
- 11:30 **Analysis of Double-Skin Facades with Wooden Cladding**
Pavel Václavů, Mendel University in Brno
- 11:45 **Simulation of Pressure Loss in Channels of Redox Flow Batteries**
Natália Podrojková, Pavol Jozef Safarik University in Kosice / INO-HUB Energy
- 12:00 **LES Simulations of the Flow Around Porous Bluff Bodies**
Blanka Ledvinková, Czech Academy of Sciences
- 12:15 **Cavities in Heat Transfer Models**
Tomáš Tichý, Hilase
- 12:30 **Lunch**
- 13:30 **Digital Poster Session A**
- 14:00 **Keynote: Battery and Fuel Cell Development with COMSOL Multiphysics**
Arpad Forberger, GAMAX
- 15:00 **Guide to Electromagnetic Compatibility Analysis Using Simulation (EMC)**
Matouš Lorenc, HUMUSOFT
- 16:30 **Coffee Break, Digital Poster Session A**
- 17:00 **Keynote: Using COMSOL in a Connected Virtual Factory**
Kush Patel, Manufacturing Technology Center
- 17:40 **Humusoft Collaboration: First Use of the COMSOL Surrogate Model in Metallurgy Fluid Flow Optimization**
Matouš Lorenc, HUMUSOFT, Karol Ondrejko, ŽP VVC
- 18:00 **Modeling of Blood Flow in Hyperelastic Vessel Model**
Jan Šimkovský, Czech Technical University in Prague
- 18:15 **Numerical Simulation of Electroporation**
Ondřej Fišer, Czech Technical University in Prague
- 18:30 **Simulations of Ultra-miniature Catheters for Microwave Ablation of Pancreatic Tumors**
Marek Novák, Czech Technical University in Prague
- 18:45 **Optimization in Hyperthermia Treatment**
Michaela Černá, Czech Technical University in Prague
- 19:00 **Coordination Meeting with University Teachers**
- 19:30 **Dinner**
- 20:30 **Social Evening - Molecular Gastronomy**

Schedule Friday 24.5.

- 9:30 **How to Model Lorentz Force in Solids and Magnetohydrodynamics**
Matouš Lorenc, Tomáš Vrbata, HUMUSOFT
- 10:30 **Keynote: Simulation-driven Engineering of Plasma Equipment for Material Applications, Gas Conversion, and Space Applications in COMSOL**
Adam Obrusnik, PlasmaSolve
- 11:30 **Coffee Break, Digital Poster Session B**
- 12:00 **Simulation of Plasmonic Enhancement at Graphene/h-BN Step Edge**
Bohuslav Rezek, Czech Technical University in Prague
- 12:15 **The Influence of Sample's Shape on Poisson Ratio**
David Vokoun, Institute of Physics of CAS
- 12:30 **Designing of the Diamond-based NV Quantum Nano-Probe for the Biological Applications**
Josef Souček, Hasselt University IMO IMOMEC
- 12:45 **Structural Model of High-temperature Vacuum-sealing Flange**
Petr Bartoň, Institute of Plasma Physics of CAS
- 13:00 **Lunch**
- 14:00 **Digital Poster Session B**
- 15:00 **Setting up a Deep Neural Network for Structural-Thermal-Optical Model**
Tomáš Vrbata, HUMUSOFT
- 16:00 **Closing Remarks**

Digital Poster Session

Digital Poster Session A:

Consultation opportunity: Heat Transfer, CFD, Chemical Reactions Making of Application

Nancy Bannach, COMSOL

Consultation opportunity: Modeling of Fuel Cells and Electrolyzers in COMSOL Multiphysics

Anna Tocháčková, HUMUSOFT

Modelling of Nanoparticle Motion in a Simple Heart Model

Darya Zhurauliová, Brno University of Technology

Modeling Processes in Nanostructure Crystallization

Ondřej Černohorský, Czech Academy of Sciences

Prediction of Thermal Stresses in NiTi Coating Layer on the Substrate Stainless Steel

Sneha Samal, Institute of Physics of Physics, Czech Academy of Sciences

Digital Poster Session B:

Consultation opportunity: Using MATLAB for Medical Image Segmentation for Subsequent COMSOL Multiphysics Simulation

Anna Tocháčková, HUMUSOFT

Simulation of Exhaled Carbon Dioxide Level in Non-ventilated Office

Vílem Kopuleť, Jiří Petřík, Brno University of Technology

Modelling of the Release of Active Substances from Hydrogel

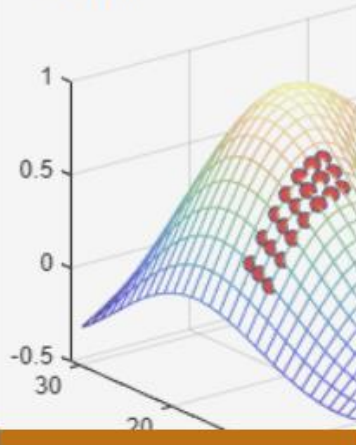
Miroslav Pekař, Brno University of Technology

- **Thursday Session A**
 - 11:00 – 11:30
 - 13:30 – 14:00
 - 16:30 – 17:00
- **Consultation Opportunity**
 - continues all day
- **Friday Session B**
 - 11:30 – 12:00
 - 14:00 – 15:00

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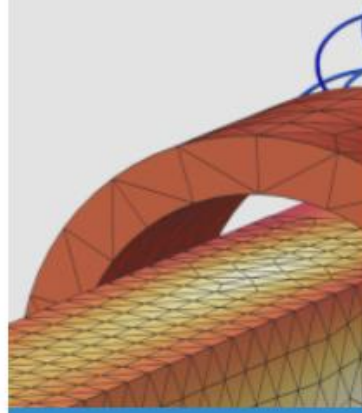
MATLAB & Simulink

Technické výpočty
a simulace



COMSOL

Simulace
multifyzikálních úloh



dSPACE

Simulace v reálném
čase



HeavyHorse

Výkonné výpočetní
pracovní stanice



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Guidelines

- the conference is not being recorded
- storage: www2.humusoft.cz/kcm2024
 - *program*
 - *users presentations*
 - *available after the end of the conference*
 - *trial license including passcodes*
- Internet access
 - no passcode
- refreshments and drinks for conference participants free of charge
 - prove yourself with a badge
 - drinks: coffee, tea, soft drinks, beer, draft wine



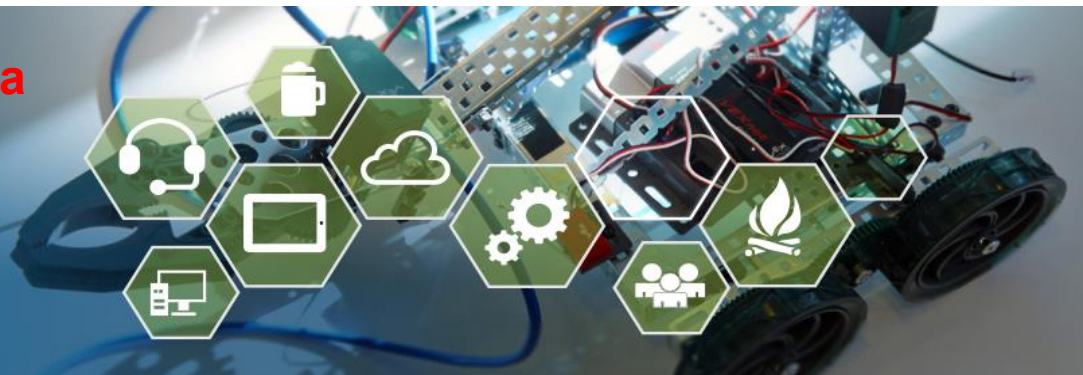
Technical Computing Camp 2024

- **11. ročník letního setkání příznivců technických výpočtů a počítačových simulací**
- Široký prostor pro neformální diskuze a výměnu názorů
- Setkání s lidmi z nejrůznějších oborů
- Informace o systémech MATLAB, COMSOL a dSPACE
- Interaktivní ukázky aplikací na hi-tech "hračkách"
 - Arduino, Raspberry pi, kamery, roboti, mobilní aplikace, ...
- Přednášky, demo ukázky od uživatelů
- Soutěž o nejlepší uživatelské projekty

Brněnská přehrada

Hotel Rakovec

5. - 6.9.
(čtvrtek a pátek)



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