Open workshop programme

Machine-learning for the simulation of nuclear power plants and other complex systems

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Day 1 programme

Introduction of the workshop

Welcome coffee: 13:00

Speaker	Title	Timing
-	Welcome coffee	13:00
V. Lagneau (ASNR)	Welcome word	13:30
B. Poubeau (ASNR)	ASSAS project overview	13:40

Results obtained in ASSAS

Speaker	Title	Timing
J. Dressner, A. Stakhanova, F. Gabrielli, (KIT)	Data generation, storage and sharing strategy	14:00
C. d'Alessandro (PSI) G. Blondet, R. Périllat, S. Dumont (PHIMECA)	Thermal-hydraulics in the primary and secondary circuits	14:20
M. Savini (ENEA) S. Fernandes-Meideros, A. Malkhasyan (BelV)	Improved initialisation of the Thermal-hydraulics solver	14:50
All	Questions	15:10

Break 15:30-15:50

Speaker	Title	Timing
A. Longhi (TU Delft), J. Dressner (KIT)	Coupled model for thermal-hydraulics and core degradation in the vessel	15:50
J. Brence (JSI), R. Zreik, T. Bassanetti (CS GROUP), M. Lubchenko (Energorisk)	Global ex-vessel phase models	16:20
G. Acharya (KTH)	Global Melcor model	16:40
D. Grischchenko (KTH)	Perspectives for the development of AI-models in ASSAS	17:00
All	Questions	17:10

Anticipated presentation from Day 2

Speaker	Title	Timing
J. Beaucourt (ASNR)	Genetic algorithm for analytical correlation discovery by machine-learning	17:30
All	Questions	17:50

Adjourn: 18:00

Day 2 programme

Scientific presentations

Welcome coffee: 8:40

Speaker	Title	Timing
F. Mascari (ENEA)	Adaptive Sampling Limit Surface Search Application to Identify Cliff-Edge Effects in Severe Accident Uncertainty Analysis	9:00
T. Eraerds (GRS)	Adaptive Sampling Methods in Uncertainty Analysis	9:20
R. Monod (ASNR)	Leveraging AI for the Estimation of Corium Properties in Severe Accident Simulations	9:40
All	Questions	10:00

Break: 10:20-10:40

Speaker	Title	Timing
N. Richter (RUB), J. Neuhaus (RUB), J. Joshi-Thomson (Stuttgart University)	InnoPhase project (RUB, Stuttgart university): Machine learning models for predicting the long-term coolability of debris beds to reduce the computing time of system codes	10:40
O. Letychevskyi (National Academy of Sciences of Ukraine)	Digital twins of critical infrastructure objects based on a neuro-insertion approach	11:20
All	Questions	11:40

Lunch break (offered by the workshop): 12:00-13:40

Speaker	Title	Timing
D. Bouhjiti (ASNR)	Bayesian methods for the update of model parameters: application to the seismic response of buildings	13:40
R. Zreik (CS Group)	AI-supported design optimisation for high-fidelity modelling of vehicles	14:10

H. Abdel-Khalik (Purdue University)	Overview of the activities of the IAEA collaborative centre on AI	14:30
All	Questions	14:50

Break: 15:10-15:40

AI in Euratom research

Speaker	Title	Timing
C. Matteoli (EC)	Use of AI in Euratom research projects: an overview	15:40
F. Mascari (ENEA, chair), G. Bontempi (Université Libre de Bruxelles), E. Righi-Steele (European Commission), N. Bousquet (EDF), H. S. Abdel-Khalik (Purdue University), S. Pignet (ASNR)	Roundtable: opportunities and challenges of machine-learning for simulations in nuclear energy	16:00
	Q&A with panellists	17:15
ASNR (B. Poubeau)	Closing remarks	17:45

Adjournment: 18:00