



GAIN

EPRI

ELECTRIC POWER
RESEARCH INSTITUTENEI
NUCLEAR
ENERGY
INSTITUTE

Agenda

Time (EDT)	Tuesday, October 5, 2021	Presenter
11:00 a.m.	ANL Welcome	Suresh Sunderrajan, ANL
11:05 a.m.	Workshop Opening: GAIN/EPRI/NEI	Hussein Khalil, GAIN Heather Feldman, EPRI
11:20 a.m.	Purpose, Objectives, Agenda	Rick Vilim, ANL
	Application and Demonstrated Value of AI/ML	Moderator - Emily Shemon, ANL
11:30 a.m.	<ul style="list-style-type: none"> AI Overview and Future Trends 	Rick Stevens, ANL
11:50 a.m.	<ul style="list-style-type: none"> Microsoft AI 	Lindsey Allen, Microsoft
12:10 p.m.	<ul style="list-style-type: none"> Optimization and Core Design 	Dave Kropaczek, ORNL
12:30 p.m.	<ul style="list-style-type: none"> Commercial Reactor Applications of AI/ML 	Rick Vilim, ANL
12:50 p.m.	<i>Q&A Session</i>	
1:10 p.m.	Break	
	Industry Perspective on AI/ML for Advanced Reactor	Moderator - Chris Ritter, INL
1:25 p.m.	<ul style="list-style-type: none"> Artificial Intelligence and Machine Learning: Fast Reactor Perspective 	Patrick Everett, Oklo
1:40 p.m.	<ul style="list-style-type: none"> Molten Salt Reactor Technology Working Group 	Lauren Lathem, Southern Co.
1:55 p.m.	<ul style="list-style-type: none"> HTGR Diagnostics with ARPA-E 	Eric Helm, Framatome
2:10 p.m.	<ul style="list-style-type: none"> Economic Solution for Low Carbon Process Heat: A Horizontal, Compact HTGR 	Koroush Shirvan, MIT
2:25 p.m.	<ul style="list-style-type: none"> AI/ML Applications and Challenges for the XE-100 	Ian Davis, X-energy
2:40 p.m.	<ul style="list-style-type: none"> Artificial Intelligence and Machine Learning Technologies: Enabling Advanced Reactor Deployment Economics 	Vivek Agarwal, INL Pradeep Ramuhalli, ORNL
2:55 p.m.	<i>Q&A Session</i>	
3:45 p.m.	Adjourn	

Agenda

Time (EDT)	Wednesday, October 6, 2021	Presenter
11:00 a.m.	Topical Sessions: Identification of Opportunities and Challenges for AI/ML Application	Lander Ibarra, ANL
11:15 a.m.	Session #1 – Design: Available ML data sets in the absence of operating adv reactors and use of ML to facilitate in-depth investigation of design options.	Chris Ritter, INL
11:20 a.m.	<ul style="list-style-type: none"> NATRIUM Perspectives on Data-Centric Advanced Reactor Design and AI/ML 	Nick Touran, TerraPower
11:35 a.m.	<ul style="list-style-type: none"> AI-Aided Design Investigations 	Andrew Johnson, USNC
11:50 a.m.	<i>Group Q&A</i>	
12:10 p.m.	Session #2 – Maintenance and Operation: AI/ML opportunities in advanced monitoring for improved situational awareness to the transformational challenge of autonomous ops.	Rui Hu, ANL
12:15 p.m.	<ul style="list-style-type: none"> Iterative Approach to Generating Data for AI/ML Applications in Advanced Reactors 	Anthonie Cilliers, Kairos
12:30 p.m.	<ul style="list-style-type: none"> AI/ML to Optimize Operations & Maintenance: Recent Successes in Existing Plants 	Rob Austin, EPRI
12:45 p.m.	<i>Group Q&A</i>	
1:05 p.m.	Break	
1:20 p.m.	Session #3 – Energy Storage and the Grid Session: AI/ML opportunities to aid in managing dispatch of clean electricity assets and energy storage devices to meet grid demand reliably and at lowest cost.	Cristian Rabiti, USNC
1:25 p.m.	<ul style="list-style-type: none"> Clean Hydrogen as an Energy Storage Medium 	Michael Green, Pinnacle West
1:40 p.m.	<ul style="list-style-type: none"> The Role of Long Duration Energy Storage in Decarbonizing the Grid 	Bao Truong, Malta Inc.
1:55 p.m.	<i>Group Q&A</i>	
2:15 p.m.	Session #4 – Materials: Design of new and improved materials using AI/ML combined phenomenological models, performance predictions, and experimental data sets.	Ben Betzler, ORNL
2:20 p.m.	<ul style="list-style-type: none"> Accelerating Materials Development Using AI/ML 	Niyanth Sridharan, Lincoln Electric
2:35 p.m.	<ul style="list-style-type: none"> Calibration and Uncertainty Estimates of the KP-FHR Material Models via Machine Learning 	Pierre-Alexandre Juan, Kairos
2:50 p.m.	<i>Group Q&A</i>	
3:10 p.m.	Planning for Future Workshops	Lori Braase, GAIN Hussein Khalil, GAIN Lander Ibarra, ANL Christine King, GAIN
3:45 p.m.	Closing Remarks	

GAIN-EPRI-NEI

Artificial Intelligence/Machine Learning Technologies for Advanced Reactors Virtual Workshop

Workshop: October 5-6, 2021 | GAIN.INL.GOV



GAIN

EPRI

ELECTRIC POWER
RESEARCH INSTITUTE

NEI

NUCLEAR
ENERGY
INSTITUTE

Acronyms

AI/ML	Artificial Intelligence/Machine Learning
ANL	Argonne National Laboratory
DOE	Department of Energy
EPRI	Electric Power Research Institute
GAIN	Gateway for Accelerated Innovation in Nuclear
HTGR	High Temperature Gas Reactor
INL	Idaho National Laboratory
MIT	Massachusetts Institute of Technology
NEI	Nuclear Energy Institute
ORNL	Oak Ridge National Laboratory
Q&A	Questions and Answers
USNC	Ultra Safe Nuclear Corporation