Webinar Invite

GEN IV International Forum
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Education and Training Working Group

Revolutionizing Nuclear Engineering Education: Developing Virtual Labs for Neutron Detection, Geiger Counter, and Reactor Experiments

In recent years, the Nuclear Industry has been facing the challenge to bridge the gap in technological fluency between generations, as highlighted in the "NSUF University Research Reactor Fitness Study Report" (2019) conducted by Idaho National Labs in collaboration with research reactors in the United States. This gap poses a significant threat to the industry, especially as the world is striving towards global decbarbonization to combat climate change. This urgency prompted our research group to develop a project with the potential to revolutionize the industry and address this challenge by bringing about a nuclear energy renaissance globally. This research project involves developing Virtual Laboratories (Virtual Labs) for nuclear engineering, which will greatly enhance the training experience of students and engineers in the industry. With the math parameterized on Matlab scripts with respect to the physics behind the neutron detector lab, Geiger counter lab, and reactor lab, the scripts could then be converted and developed in C# using the Unity game engine. The Neutron detection Virtual Lab offers instructor-tailored procedures for setting up and plugging of nuclear electronics and aims to develop modular virtual lab electronics for broader applications. The Geiger counter lab simulates radiation detection using the dose rate equation and gamma attenuation equation, with plans to move from 2D to an augmented reality 3D representation. The virtual reactor lab uses point kinetics (PKE) to simulate the PUR-1 light water open pool reactor located at Purdue University, with actual reactor data for benchmarking. The development of these virtual labs not only has the means of bridging the technological fluency and generational gap thus identified in the nuclear industry and assisting in decarbonization efforts but also the potential to integrate with AI (Artificial Intelligence) and take our industry to that next level.

Free webcast!

January 31, 2024
8:30 am EST (UTC-5)

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Who should attend:
policymakers, managers, regulators, students, general public

Mr. Jonah Lau is an undergraduate Nuclear Engineering researcher and student at Purdue University with hopes of starting his own company. In the past, Jonah has worked at a UAS startup called Avetics, in their R&D department, developing drone applications contracted by companies such as Shell O&G, Petronas, etc. His current aim is to deliver Nuclear Engineering places where it is needed the most. He likes to read on game theory, metaphysics, and SSRN.

Upcoming Webinars

28 February 2024, Analysis of the Reactivity Loss of the Phenix Core Cycles for the experimental validation of the DARWIN-FR Code Package, Mr. Victor Viallon, CEA, France

20 March 2024, Overview of Canadian R&D Capabilities to Support Advanced Reactors, Lori Walters, CNL, Canada

17 April 2024, Multiphysics Depletion & Chemical Analyses of Molten Salt Reactors, Samuel Walker INL, USA

For more information, please contact Patricia Paviet at patricia.paviet@pnnl.gov or visit the GIF website at www.gen-4.org

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