

PSEforSPEED Webinar 2025

Hybrid AI for Augmented PSE Techniques: Integrating AI & Human Intelligence



Date:
WEDNESDAY, 22 OCTOBER 2025



Time:
14:00 – 16:00 (CET)

Live Session on **zoom**



TIME SCHEDULE

TIME (CET)	SESSION	SPEAKERS
14:00 - 14:45	Lecture: Introduction; scope & significance; background theory; software tools	Prof. Rafiqul Gani
14:45 - 15:45	Case Studies: Hybrid AI-SEP & Hybrid AI-CAFD	PSEforSPEED TH TEAM <ul style="list-style-type: none">- Thunyaras P.- Kris P.- Rungroj Y.
15:45 - 16:00	Q&A and Discussion Session	All Speakers

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Hybrid AI for Augmented PSE Techniques: Integrating AI & Human Intelligence

Brief Overview

- ☀️ **Hybrid AI:** integrated & augmented PSE techniques for systematic, correct, consistent, and rapid solution of problems in product and/or process engineering. The lecture will highlight the scope & significance of hybrid AI techniques; provide the background knowledge; overview of computer-aided model (and data) based tools; and problem solving features through practical (non-trivial) case studies.
- ☀️ **Two Software Tools** will be presented: **Hybrid AI-CAFD** (Sustainable Process Synthesis, Design, Analysis, and Innovation), and **Hybrid AI-SEP** (Separation of Chemicals). Both hybrid AI tools have problem solving & educational options.

Software Introduction

Hybrid AI- CAFD

Hybrid AI-CAFD (features): Multiple entry points; generation of all feasible flowsheets (entry at synthesis step), including a parser to convert flowsheets to eSFILES & hypergraphs, and vice versa: reverse design for unit operations (entry at design step); links to external simulators (entry at simulation step); links to analysis tools such as economics, LCA, etc. (entry at analysis step); & links to innovation tools for process improvement (innovation step). Note that hybrid AI-CAFD has a feature for automatic generation of input to the linked simulators,, analysis and innovation tools.

Hybrid AI-SEP (features): includes problem solution and tutorial (educational) modes related to separation of chemicals; uses a collection of SLMs and static databases; generates needed data during problem solution steps through linked links computer-aided tools (prediction of properties, phase equilibrium, separation technique feasibility, etc.); verification of separation technique feasibility; mass separation agent (solvent, adsorbent, membrane, etc.) selection and/or design; selected separation process analysis, and many more.

Hybrid AI- SEP