PSE Seminar Fall 2023

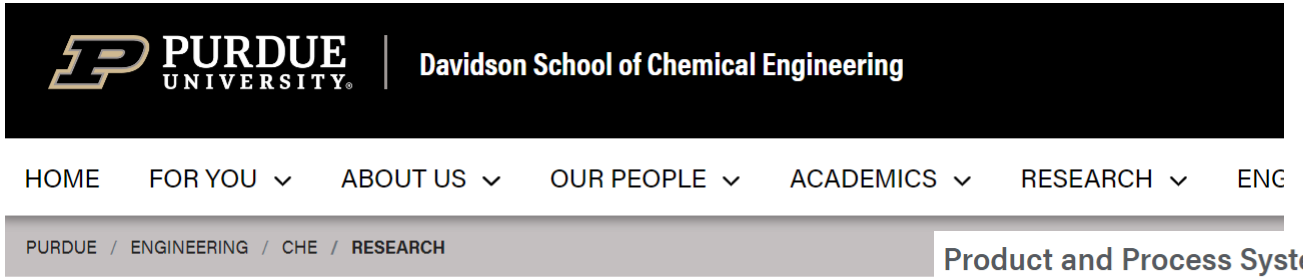
David E. Bernal Neira

Welcome slides and rules

September 1st, 2023

PURDUE UNIVERSITY

Process Systems Engineering at Purdue



Chemical Engineering Research Areas

Davidson School of Chemical Engineering at Purdue University has a commitmen
defining research that is regarded worldwide for its impact and quality. Our facult
country. We are proud of our distinguished faculty members, including six elected
Academy of Engineering and a recent recipient of the National Medal of Technolo
numbers rank among the largest in the nation in chemical engineering. The range of research topics pursued
at Purdue is very broad.

Research by Fundamental Topic Area

Product and Process Systems Engineering

- Agrawal (Energy Systems, Solar Economy, Transportation)
- Kim
- Li (Product and Process Systems Engineering, Energy Systems, Pro
- Nagy (Process Control and Optimization, Systems Engineering)
- Pekny (Deliberate Innovation)
- Reklaitis

Research by Application Area

Expand all

Biotechnology

Electronics

Energy

Manufacturing

Pharmaceuticals

Polymers and Advanced Materials

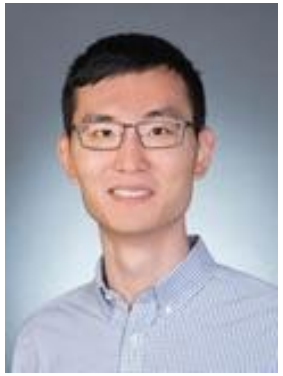
Security

Process Systems Engineering at Purdue

- Faculty at the Davidson School of Chemical Engineering who I think have groups doing PSE work


Agrawal


Bernal Neira


Li


Masuku


Nagy


Pekny


Reklaitis


Siirola

What is PSE? Why PSE? *The generation next?*

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journal homepage: www.elsevier.com/locate/compchemeng

Review

Process systems engineering – *The generation next?*

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ABSTRACT

Process Systems Engineering (PSE) is the scientific discipline of integrating scales and components describing the behavior of a physicochemical system, via mathematical modelling, data analytics, design, optimization and control. PSE provides the 'glue' within scientific chemical engineering, and offers a scientific basis and computational tools towards addressing contemporary and future challenges such as in energy, environment, the 'industry of tomorrow' and sustainability. This perspective article offers a guide towards the next generation of PSE developments by looking at its history, core competencies, current status and ongoing trends.

Authors

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Texas A&M University 1876

TÉCNICO LISBOA

Korea Advanced Institute of Science and Technology KAIST 1971 한국과학기술원

Imperial College London

RWTH Rheinisch-Westfälische Technische Hochschule Aachen

Purdue University

Columbia University in the City of New York

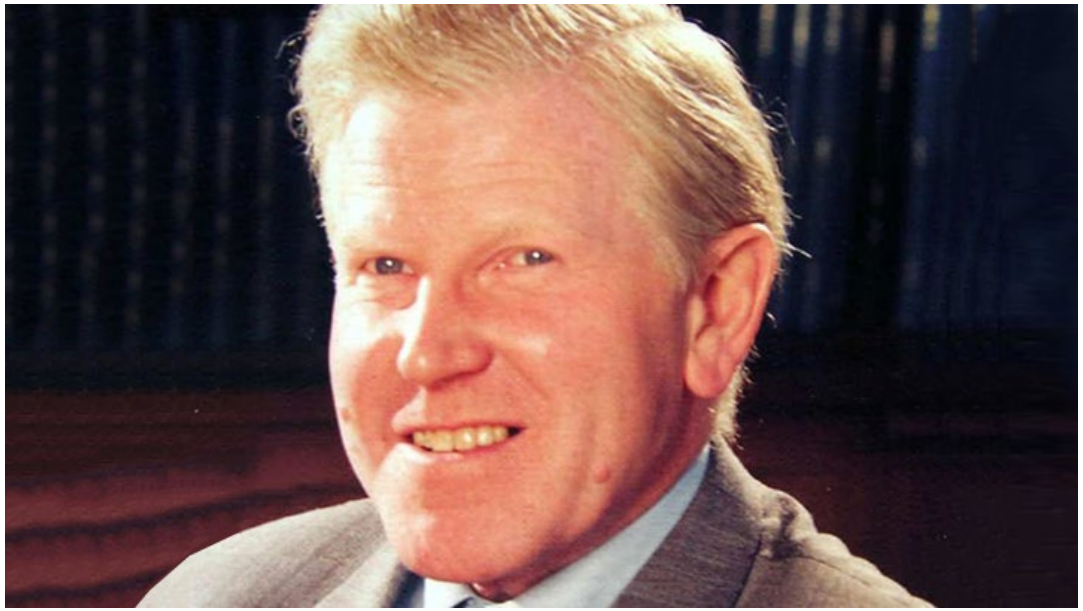
Cornell University Founded A.D. 1865

PSE for SPEED

Purdue University

PSE definition

Process Systems Engineering (PSE) is the scientific discipline of integrating scales and components de- scribing the behavior of a physicochemical system, via mathematical modelling, data analytics, design, optimization and control.



"Process systems engineering is all about the development of systematic techniques for process modelling, design and control"

"Some formulate their synthesis, design and/or control problem, or some useful simplification of it, in precise mathematical terms, and then seek to exploit the mathematical structure to obtain an effective algorithm, while others seek in- sight on the problem structure from physical intuition"

PSE Seminar at Purdue

Goal

- **Improve discussions** within research groups regarding state-of-the-art research
- **Share knowledge** between us
- **Identify** the **collaboration opportunities**

Challenges

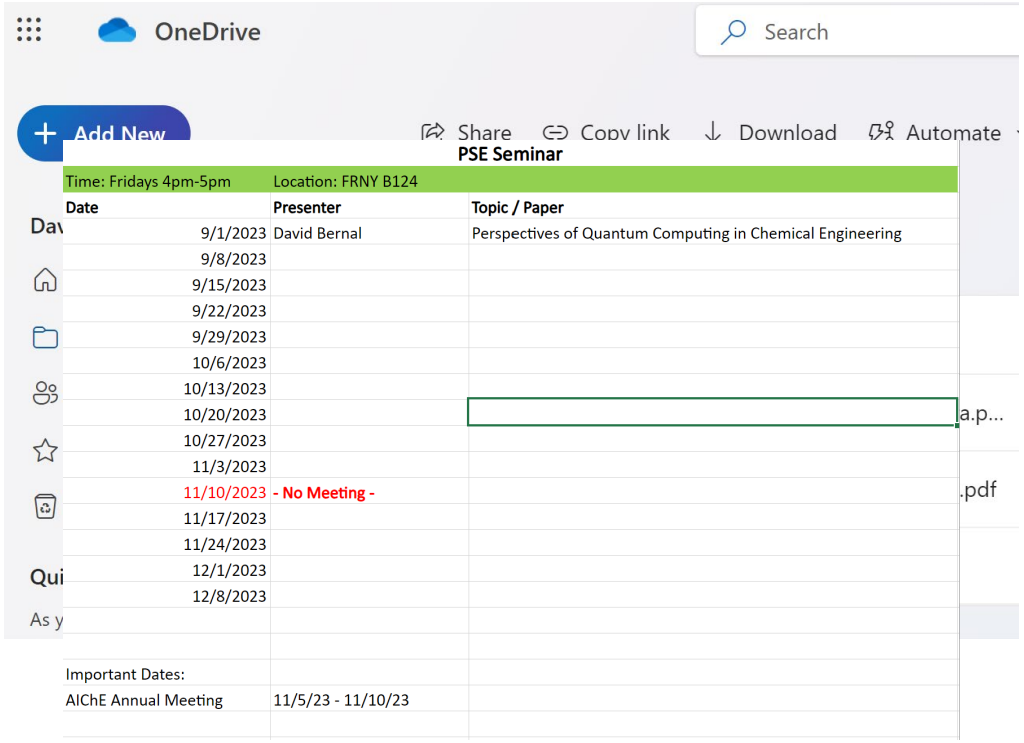
- It relies on **volunteering and participation**
- T**ime commitment** from all of us

Approach

- Volunteering
- **Volunteering**

Bring interesting research/papers to discuss with the us.

Submit your slides for future reference



Maintaining the PSE community vibrant

Mailing list

We have an active mailing list, please subscribe.

We will share:

- Internship/job opportunities
- Seminars across campus
- Information relevant to us

Proposed rules

- Talks here should be related to research
- Slides are highly appreciated but not **absolutely** necessary
- Any criticism made here Is toward the work and not the authors – Remember we are dealing with people!
- New ideas welcome
  - Broader than research update from students: tutorial of small research area and overview of what has been done
  - Option to attend virtually/recording talks/broadcasting them on YouTube

Welcome to the Purdue PSE Seminar!