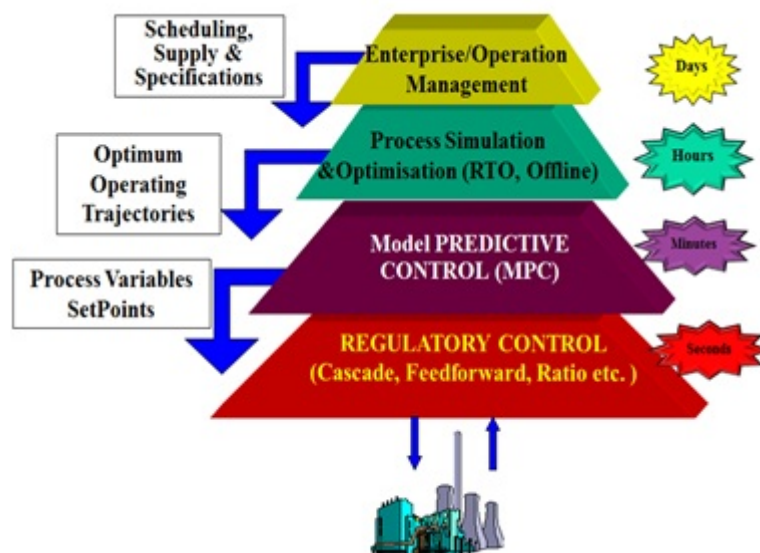


Process Systems Engineering

The process systems engineering research area is focused on high-fidelity modeling of complex chemical processes within a framework for optimization and advanced operation. Several areas are covered and these include:

1. Advanced mathematical modeling to help conduct comprehensive studies and carry out an in-depth analysis of process dynamics. The models are used as an advanced tool to supplement experimental work and to optimize the process in terms of operating conditions. The development of mathematical models comprises population balance equations, heat and mass transfer, heterogeneous catalytic reactions etc.. Applications include pyrolysis, predictive emissions monitoring systems, concentrated thermal solar plants design and sizing (Fresnel concentrators, stirling engines, integrated energy storage schemes).
2. Process optimization, advanced control and Soft-sensing: Model based optimization incorporating key process performance indicators along with environmental and economical factors to increase the overall efficiency and economic viability of processes. Advanced methods are integrated within a single/multiple application frameworks involving object oriented flowsheeting and equation based programming.



Active Researcher:
Dr. Joseph Zeaiter