

Abstract

Can AI bring value in a chemical industrial context or is it too soon or just another hype?

Pharmaceutical research is constantly looking into unmet medical needs and addressing them with new, more active and specific molecules that bring greater value to patients. To do this; the molecular structures of active pharmaceutical ingredients (API) are becoming much more complex while development timelines drastically shorten within a very dynamic landscape with stronger regulatory requirements and focus on cost. This requires a transformation of chemical process R&D both in the chemical development labs and the plants and opens an opportunity for AI to reshape the way chemical processes are developed, transferred from labs to plants and how these plants are operated.

Within the J&J chemical pilot plants; a self-optimizing; autonomous process digital twin was developed to predict the scale up of a chemical process step from lab to plant, optimize this step during live production and autonomously – without any human in the loop – run this chemical process in the most optimal way. This industry-first case study is the equivalence of the self-driving car and opens the door to rethink the chemical process development & production paradigm within pharmaceutical industry.

Biography

Niels Vandervoort graduated as a chemical engineer from KU Leuven 12 years ago. After a short passage as a data engineer within the petrochemical industry, Niels joined J&J 10 years ago. Through a variety of roles combining data, systems, modelling & process engineering within the synthetics both in development as well as commercial manufacturing in the Geel & Beerse sites. Within these roles, Niels lead several consortia fostering data & AI. Last year, Niels became Director Digital transformation within the synthetic's development organization; a role in which he helps to rethink the synthetics development paradigm and transform how we develop new synthetic therapies through data, modelling & AI.