Dr. Helen Lou

Dr. Helen H. Lou, a professor in the Dan F. Smith Department of Chemical Engineering at LU and member of the Midstream Management and Science Center's Faculty Advisory Board, has been named a Midstream Center Profiles in Midstream Honoree.

"Dr. Lou is a phenomenal contributor to the Center," said Thomas Kalb, director of the Midstream Center Management and Science. "She has a background in chemical engineering and computer science, which she combines for practical application within industry. We're lucky to have her on our team."

Lou is a fellow of the American Institute of Chemical Engineers and the recipient of the Lamar University Professor and University Scholar award. She has a Ph.D. in chemical engineering and a master's degree in computer science. Her areas of expertise include big data analytics and machine learning and process systems engineering. Lou has successfully applied these technologies for the sustainable development of the chemical process industry.

As an example, Lou worked with a Fortune 500 chemical manufacturer to improve its operational excellence. Utilizing process distributed controlled systems historian data, Lou identified a strategy to safely increase the selectivity of an ethylene oxide process by 3.3%, which yields $4.3 million annual profit increase. Similarly, for an ethanolamines process producing monoethanolamine, diethanolamine and triethylamine, Lou found a way to reduce the undesirable byproducts by 66%. Reducing 1-pound of undesirable byproduct means saving $0.30, which equates to a tremendous economic gain.

Currently Lou is conducting research related to the use of artificial intelligence in the process industry. While there has been strong momentum to use AI in the process industry, it can be difficult to explain or interpret the resulting black-box AI models, which hinders the trust and adoption of AI approaches.

"The main objective of my project is to develop a novel Trustworthy AI (TAI) method for data analytics, model prediction and decision making in midstream industry," said Lou.

According to Lou, TAI method can organize data, discover intricate relationships among the data, enrich the data with critical new engineering insights, market trend, and transform data into tangible business value.

"These tremendous values can be added to improve asset integrity, business agility and profitability, while reducing risks," said Lou.