

## Future Research Plan

Following the lists of the projects undertaken during the Ph.D. study. The work was inspired by the real need in the Natural gas industry. This was done in close collaboration of industrial projects. For more information regarding research specific work/publications kindly follow the link below.

**Publication link**      <http://orcid.org/0000-0002-6798-8418>

Presently my ongoing interest is in the same direction. But a new research area and plan is always appreciated by me and can be seen through my research interests.

### Future research interest

- Optimal design and operation of energy management systems under uncertainty
- Optimization of LNG/NGL processing plants by employing stochastic and deterministic optimization methodologies.
- Development of integrated advanced organic Rankine cycle (ORC) & LNG process.
- Six Sigma design of NGL plant for reliable plant operation
- To explore more about the integration of synthetic natural gas plant and separation operation for LNG as a fuel
- Incorporating Membrane module in LNG plant for SNG application
- NG liquefaction cycle development, assessment and improvement
- Development and optimization of NGL recovery schemes
- Rigorous modeling of Multi-Stream Heat Exchanger.
- Black box optimization algorithm developments.
- Machine learning and artificial intelligence
- Data-driven and model-based optimization
- Automatic estimation, identification and detection
- Automatic control technologies

### Projects Handled

#### Sep 2013–Mar 2017      **Retrofit & Optimal Synthesis of LNG plant Responsibilities/Achievements**

- Design, optimization and Operational feasibility study of LNG process plant; funded by Gas Plant and Engineering Development Research Center (EDRC) funded by the Ministry of Trade, Industry & Energy (MOTIE) and by Priority Research Centers Program through the National Research Foundation of Korea (NRF) funded by the Ministry of Education.
- Project responsibilities include; Simulation studies of the representative NG liquefaction technologies. Carry out optimization studies of the representative processes.

**Apr 2017- Present**

**SBR-Anammox System Modeling & Simulation for Complete Autotrophic Nitrogen Removal (CANR)** from municipal wastewater plant side stream. Sponsored by Doosan Heavy Industries Limited, Korea.

**Responsibilities/Achievements**

- Development of conceptual control philosophy for CANR
- Development of Anammox model and simulation for the single stage sequential batch reactor
- Model parameter estimation and its calibration
- Development of soft sensing devices based on ANN