

Delin Hu

Contact Information	Department of Automation Tsinghua University Haidian, Beijing, China	Tel: 86-18685143289 hdl16@mails.tsinghua.edu.cn
Education	Tsinghua University , Beijing, China M.E. in Control Science and Engineering Core Courses: Matrix Analysis and Applications, Pattern Recognition, Multi-Sensor Fusion Theory and Applications, Statistical Methods with Applications, Experiment Design and Data Processing. Grade: 85/100 Sichuan University , Sichuan, China B.E. in Automation Core Courses: Probability theory & Mathematical Statistics, Linear Algebra, Calculus, Theory of Circuitry, Basic Analog Electronics, Fundamental Digital Electronic Technique, Theory of Automatic Control, Complex Variable, Programming in C, Principles of Microcomputer. Grade: 77/100	2016 - 2019 (Expected) Advisor: Prof. Yi Li 2011 - 2015 Advisor: Prof. Xiaomei Yang
Publications	Delin Hu , Jinku Li, Yinyan Liu, Chaojie Zhao and Yi Li, “A new method for mass flowrate measurement of gas-liquid two-phase flow based on neural network”, <i>Submitted to IEEE Trans on Instrumentation and Measurement</i> . Delin Hu , Jinku Li, Yinyan Liu and Yi Li, “Flowrate prediction of gas-liquid multiphase flow based on convolutional neural network and improved domain adversarial network”, <i>Submitted to IEEE Trans on Neural Networks and Learning Systems</i> .	
Research Experience	Machine learning aided multi-modalities sensors data fusion for petroleum industrial process monitoring and measurement Aug.2018-Dec.2018(Expected) <ul style="list-style-type: none">• Design and conduct dynamic experiments to collect data from various sensors including electrical capacitance tomography (ECT) sensors, electrical resistance tomography (ERT) sensors, microwave sensors and differential pressure sensors.• Establish a monitoring system, which can provide various parameters of multiphase flows existing in many industrial processes, with the application of machine learning techniques including autoencoder, multi-tasks learning and so on. Flowrate prediction of different multiphase flows with the application of transfer learning technique Mar.2018-Jul.2018 <ul style="list-style-type: none">• Train domain adversarial networks (DANs) with labeled source domain samples (water-air two-phase flow), unlabeled target domain samples (oil-air two-phase flow and oil-water-air three-phase flow).• Propose and train improved domain adversarial networks (IDANs) on the framework of DAN.• Test and compare the performances of IDANs, DANs and CNNs on target domain samples. Flowrate prediction of gas-liquid multiphase flows based on multi-channels differential pressure time series Jan.2018-Mar.2018 <ul style="list-style-type: none">• Design and conduct dynamic experiments to collect multi-channels differential pressure time series generated by different gas-liquid multiphase flows including water-air two-	

- phase flow, oil-air two-phase flow and oil-water-air three-phase flow.
- Train CNNs using water-gas two-phase flow samples with different output objectives, such as mass flowrate, momentum flowrate and volume flowrate.
 - Test and compare the performances of different CNNs on oil-air two-phase flow samples and oil-water-air three-phase flow samples.

Transient flowrate estimation for gas-liquid two-phase flow Sep.2017–Dec.2017

- Design and conduct dynamic experiments to collect multi-channels differential pressure signals of horizontally mounted Venturi tube generated by water-air and oil-air two-phase flows.
- Train NN model to predict transient flowrate using the average flowrate during a period as reference information.
- Test the prediction model on different datasets, analyze the shortages and try to seek better solution.

Investigation of over reading correlations concerning flowrate measurement of gas-liquid two-phase flow Mar.2017-Jul.2017

- Investigate the published methods for flowrate measurement.
- Propose a new over reading correlation based on momentum equation and dimensional analysis.
- Compare the results of different methods, analyse the disadvantages and try to seek better solution.

Fault diagnosis based on compressed sensing Sep.2016-Dec.2016

- Propose a method based on ℓ_1 and ℓ_∞ mixed optimization for fault diagnosis.
- Compare the performances of different algorithms including MP, OMP, MAPOMP, and mixed norms optimization.

Image classification based on convolutional neural networks Sep.2016-Dec.2016

- Classify face images according to gender using CNNs.
- Compare the performances of CNNs and other methods such as SVM and Adaboost.

Awards	Tsinghua University Scholarship	2017
	Sichuan Univeristy Scholarship	2014

Computer Skill	Programming	Python, Matlab, R, C++
	Deep Learning Framework	Pytorch, Tensorflow
	Document Editing	Latex, Microsoft Office