Yichen Li

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EDUCATION BACKGROUND

Huazhong University of Science and Technology (HUST), Wuhan, China **09/2016-06/2020**
School of AI and Automation B.E. Measuring and Control Technology and Instrumentations GPA: 3.40/4.0
UIUC summer school **07-08/2017**
Completed Courses: Control System 98/100(A+); Information Science & Strategy 89.78/100(B+)

RESEARCH EXPERIENCES

Group Leader, A model and data-based SOFC performance reasoning and optimization method **02/2020-present**
Mentor & Location: Professor Xi Li, Fuel Cell Research Center of HUST
Statement: publishing a patent based on this method
Objectives: combining two main field of SOFC (Solid Oxide Fuel Cell) health prediction and fault detection, data-based and model-based, to reach a better timely manner and more accuracy than any single method.

- Build a SOFC mathematical model with knowledge of physics and chemistry. Keep the formula but set coefficients that cannot be determined under certain specific circumstances within the scope of application to unknown.
- The PSO (Particle Swarm Optimization algorithm) is applied to optimize these coefficients. And transfer the model to state space. Granger causality test is performed on each variable in the actual system operating data to obtain the causality relationship of each variable in the actual situation
- According to the obtained state space and causality relationship matrix, analyze and judge whether the model conforms to the actual situation and evaluate the optimization effect

Leader, SOFC System Health Prediction and Fault Detection Based on Big Data and Machine Learning 03/2019-01/2020
Mentor & Location: Professor Xi Li, Fuel Cell Research Center of HUST
Objectives: to predict the running state of SOFC(Solid Oxide Fuel Cell) system by algorithm and automatically analyze the failure cause to adjust the avoidable fault and report the inevitable fault that needs to be fixed manually

- Explored, analyzed and deduced hidden relationships among system data with the help of pattern recognition and big data prediction obtained from historical data
- Obtained a possible future trend of the net output power of the system simulated by the Wiener Process and compared it with the actual system operation results so as to determine whether the fault occurred, and then used the BP neural network to detect the fault type

Core Member, PMT Signal Processing Based on Machine Learning and MVT **05/2019-12/2019**
Mentor and Location: Professor D'Nicola, HUST PETLab
Objective: to process data sampled by Matlab from continuous signals of ADC devices in low sampling rate to make it obtain the total energy value of the whole frequency band

- Collected data using Matlab, and then filtered several equal voltage points as network output from the sampling data with MVT methodology. Analyzed the output energy of ADC sampling points with BP Neural Network & CNN (Convolutional Neural Network) after the input points was confirmed
- To employ Tensorflow to edit the activation function and weight matrix to achieve more accurate results, conduct spectral analysis on the output to obtain the results of Compton continuum, full-energy peak and escape peak, and interpret the measured sample state according to the results

Participant, A Study of Deep Learning System Based on Memristor **09/2017-06/2018**
Mentor and Location: Professor Shiping Wen, HUST
Objective: to work out a neural network model adapted to memristor chips to meet the high computing capability requirements brought by deep learning

- Assisted to develop the activation function and window function for the memristor neural network, which greatly improves the performance

Leader, Program Based on DOS System and Borland C **06/2017-11/2017**

Objective: to achieve visual simulation of the landing, take-off and dispatch procedure of aircraft port

- Accomplished man-machine interface with C language including invoking the Chinese character library, editing interrupt service program, and rendering the interface
- Set up the administrator system and operator system and prepared all required documents such as the username, password, task execution times, and the fuel condition of the aircraft carrier
- Edited the shortest path and collision algorithm to keep the program runs well

COMPETITION EXPERIENCES

Key member, "Siemens Cup" China Intelligent Manufacturing Challenge **06/2019**

Details: A network composed of multiple flow accelerometer based on pressure detection is established and used to monitor a section of pipeline, so as to obtain data changes through wireless transmission as soon as possible, and comprehensively process data to find out leakage points

Group leader, Mathematical Contest in Modeling **04/2019**

Details: Led my team to discuss and analyze previous competition topics and chose one under category B which suits our specialty the most. Set up the models for rescue route planning and container loading on the basis of Matlab. Conducted flexibility tests of the models and independently completed the paper in English

EXTRACURRICUL AR ACTIVITIES

Class monitor, School of Artificial Intelligence and Automation, HUST **09/2016-10/2018**

- Served as a communication bridge between students and teachers; offered academic assistance and improved the class average scores from 75 to 78 in a year; organized classmates to participate in experiment and various activities and won several honors in contests;

Director, Broadcast Station, HUST **07/2017-07/2019**

- Managed daily broadcasting programs, duty shift, broadcaster training and facilitated the programs innovation
- Planed and organized evening parties, and responsible for the operation and management of the English broadcasting group

ICD(International Communication Department) group leader, SICA in HUST **09/2017-01/2019**

- Acted as the leader in TPIS (international students mentoring program) to assist international students' study at HUST and helped to organized the party of 2018 SICA NIGHT

SKILLS

Programming language: C, C++, MATLAB, Python, R, FPGA

Software: AE, AU, PS, PR, MATLAB, DOS Simulator, Visual C++, Tensorflow, CCS, LabVIEW, Quartus, Multisim, Pspice, PyCharm, Geany, Cinema 4D

Hardware experience:• Made a lossless audifier with tuning indicator based on LM386, μA741 and NE555 chips, and successfully tackled the coupled noise problem in integrating the components

•Designed a 24s counter model based on NE555, 74LS192 and CC4511 applied to time keeping in the basketball game

•Developed the digital filter, analog digital converter and digital-to-analog converter based on CCS software and DSP chip

•Made infrared decoder based on 51 single chip and Keil programming

HONOR & AWARDS

- Successful Participant in Siemens Cup China Intelligent Manufacturing Challenge 06/2019
- Successful Participant in MCM/ICM (67.50%) 04/2019
- 1st Prize in China Collegiate Computing Contest, National Level (5/200) 07/2017
- 2nd Prize in China Collegiate Computing Contest, Central South Division (30/150) 04/2017