



Junjie Yang

PhD student at
University Paris Saclay

- Supervisor:** Claude DELPHA
- Date of Birth:** Nov. 1992
- Orsay, 91400, France
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Interests

- Fault Diagnosis and Prognosis
- Incipient fault detection
- Fault isolation and estimation
- Machine learning
- Multivariate statistical analysis

Skills

Programming:

Matlab

Python

C

Labview

Tools:

Simulink

Scikit-learn

Pytorch

Pandas

Languages:

Chinese

English

Education

Postgraduate Studies

Oct.2019 – now

Ph.D. in University Paris Saclay

Gif sur Yvette, France

Title: Fault diagnosis and prognosis in multivariate complex systems.

Supervisors: Prof. Claude DELPHA

Fault diagnosis and prognosis

Incipient fault detection

Mahalanobis distance

Multivariate statistical analysis

Sep.2016 – Jun.2019

M.Sc. in Guangdong University of Technology

Guangdong, Chine

Title: A new method for estimating the volume under a three-class ROC surface based on KNN classifier.

Major: Control science and engineering

Supervisors: Prof. Weichao Xu

Receiver Operating Characteristic (ROC) curve

The Volume Under the Surface (VUS)

KNN

Undergraduate Study

Sep.2012 – Jun.2016

B.Sc. in Guangdong University of Technology

Guangdong, Chine

Project Title: Open circuit fault diagnosis for interleaved DC-DC converters

Major: Automation

Other Training

Sep.2017 – Feb.2018

Visiting Student in Polytech Nantes

Nantes, France

Domain: Wireless embedded technology

Research Experiences:

Fault diagnosis and prognosis in multivariate complex systems

Proposed the Empirical Probability Density Cumulative Sum approach for incipient fault detection

Proposed the Local Mahalanobis Distance and summarized its statistical properties

Developed a highly sensitive fault detection method based on the Local Mahalanobis Distance and Empirical Probability Density Cumulative Sum approach

Developed faulty variable isolation and fault severity estimation approaches based on the local Mahalanobis distance

Open circuit fault diagnosis for interleaved DC-DC converters

Developed an analytical mode of Multi-phase interleaved converter and proposed a least-squares identification method for fault detection

Built the simulation and experiment set-up of four-phases interleaved DC-DC converter and evaluated the performance of the model-based open circuit fault diagnosis method

Receiver Operation Characteristic analysis and its applications

Proposed a fast algorithm for estimating the Volume under the ROC surface

Applied the ROC analysis to the change point detection problem

Developed python package and software for multi-class ROC analysis

Publications

- **J. Yang** and C. Delpha. An Incipient Fault Diagnosis Methodology Using Local Mahalanobis Distance: Detection Process Based on Empirical Probability Density Estimation. *Signal Processing*, 2022, vol. 190, p. 108308.
- **J. Yang** and C. Delpha. An Incipient Fault Diagnosis Methodology Using Local Mahalanobis Distance: Fault Isolation and Fault Severity Estimation. *Signal Processing*, 2022, p. 108657.
- **J. Yang** and C. Delpha. Reconstruction-based Method Using Local Mahalanobis Distance for Incipient Fault isolation and Amplitude Estimation. *Transactions on industrial informatics* , Under Review.
- S. Liu, **J. Yang**, X. Zeng, H. Song, J. Cen, W. Xu, An Efficient and User-Friendly Software Tool for Ordered Multi-Class Receiver Operating Characteristic Analysis Based on Python, *SofewareX*, 2022, vol.19, p.101175.
- Y. Wang, G. Huang, **J. Yang**, H. Lai, S. Liu, C. Chen, W. Xu. Change Point Detection with Mean Shift Based on AUC from Symmetric Sliding Windows. *Symmetry*, 2020, 12(4), p.599.
- **J. Yang** and C. Delpha. Incipient Fault Severity Estimation Using Local Mahalanobis Distance. *IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP2022)*, May 7-13, 2022, Singapore, pp. 5977-5981.
- **J. Yang** and C. Delpha. Local Mahalanobis Distance Envelope Using A Robust Healthy Domain Approximation For Incipient Fault Diagnosis. *IEEE International Conference on Industrial Electronics (IECON 2021)*, Oct 13-16, 2021, Toronto, Canada, pp. 1-6.
- **J. Yang** and C. Delpha. A Local Mahalanobis Distance Analysis Based Methodology for Incipient Fault Diagnosis, *IEEE International Conference on Prognostic and Health Management (ICPHM 2021)*, June 7-9, 2021, Detroit, Michigan, USA, IEEE.
- **J. Yang** and C. Delpha. Open-Circuit Fault Diagnosis for Interleaved DC-DC Converters, *IEEE International Conference on Industrial Electronics (IECON 2020)*, October 18 - 21, 2020, Singapore, Singapore, IEEE, pp. 3982-3987.
- **J. Yang** and C. Delpha. Empirical Probability Density Cumulative Sum for Incipient Fault Detection, *Prognostics and Health Management Conference (PHM 2020)*, May 4 - 7, 2020, Besancon, France, IEEE, pp. 187-192.
- **J. Yang** and C. Delpha. Bearing Faults Detection Approaches Using Statistical Feature Extraction and Probability Based Distance: A Comparative Study, *IEEE International Conference on Industrial Electronics (IECON 2022)*, Oct 17 - 20, 2022, Brussels, Accepted.