Lang Zhang

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EDUCATION BACKGROUND

Chongqing University – School of Big Data & Software Engineering   09/2019 - 06/2023

Candidate for Bachelor of Engineering in Data Science and Big Data Technology

Overall GPA: 3.51/4

PUBLICATIONS

Zhang, L., & Xiao, F. (2022). A novel belief χ^2 divergence for multisource information fusion and its application in pattern classification. *International Journal of Intelligent Systems*, *37*(10), 7968–7991. https://doi.org/10.1002/int.22912

Zhang, L., & Xiao, F. (2023). Belief Rényi Divergence of Divergence and Its Application in Time Series Classification. *IEEE Transactions on Pattern Analysis and Machine Intelligence.*

Zhang, L., Xiao, F., & Cao, Z. (2022). Multi-channel EEG Signals Classification Via CNN and Multi-head Self-attention on Evidence Theory. *Information Sciences.*

Zhang, L., & Xiao, F. (2022, December 2-4). *Belief χ^2 Divergence-based Dynamical Complexity Analysis for Biological Systems*. 4th International Conference on Machine Learning for Cyber Security, Guangzhou, China.

Zhang, L., & Xiao, F. (2022, December 28-30). *Belief Kullback-Leibler Divergence-based Dynamical Complexity Analysis for Biological Systems.* The 10th International Conference on Information Systems and Computing Technology, Guilin, China. (Best Paper Award)

SKILLS

Research Skills: MATLAB, Python, C, C++, JAVA, MySQL, LaTeX, Origin, ECharts, SPSS

RESEARCH EXPERIENCE

Belief Rényi Divergence of Divergence and Its Application in Time Series Classification   07/2022 - 11/2022

- Converted time series data to mass function by means of the Dempster-Shafer evidence theory
- Figured out the complexity of time series according to the belief Rényi divergence of divergence
- Applied the proposed model to cardiac inter-beat interval time series classification, which showed high classification accuracy (89.56%) to distinguish the healthy and pathological subjects

Belief Kullback-Leibler Divergence-based Dynamical Complexity Analysis for Biological Systems

09/2022 - 10/2022

- Analyzed the biological time series by using the Kullback-Leibler divergence
- Demonstrated the physiological states of subjects by means of complexity measurement
- Applied the proposed algorithm to cardiac inter-beat time series data to show the effectiveness of feature extracting, which had a high pattern classification accuracy of 81.89%

Multi-channel EEG Signals Classification Via CNN and Multi-head Self-attention on Evidence Theory

02/2022 - 10/2022

- Combined convolutional neural networks and evidence theory together with multi-head self-attention mechanisms
- Proposed an algorithm to combine the outputs of multi-type neural networks
- Verified the effectiveness of the proposed method with electroencephalography signals in fatigue driving detection according to high classification accuracy (84%) of event-related potential signals and sensitive analysis

Belief χ^2 Divergence-based Dynamical Complexity Analysis for Biological Systems   05/2022 - 07/2022

- Extracted the feature of biological systems time series data by converting data into mass function with the Dempster-Shafer evidence theory
- Proposed an algorithm based on symmetric enhanced belief χ^2 divergence to figure out the complexity of biological systems time series data by generating basic probability assignments and measuring the average divergence of them
- Carried out an application for pathological states analysis in cardiac inter-beat interval time series, which showed the proposed method had outstanding performance in biological systems time series feature extracting

A Novel χ^2 Divergence for Multisource Information Fusion and its Application in Pattern Classification

10/2021 - 06/2022

- Proposed symmetric enhanced belief χ^2 divergence which satisfied the properties of nonnegativity, nondegeneracy, and symmetry
- Considered the discrepancy and correlationship between belief functions to measure the divergence in evidence theory
- Derived a novel algorithm of Dempster-Shafer evidence-based multisource information fusion, which showed good performance to manage conflicting evidence
- Put forward an application in pattern classification, which had more accurate results (94.39%) than well-known works

PROJECT EXPERIENCE

Online Mall Web Development (*Group Member*)   06/2022 - 08/2022
- Completed web visualization by using the Vue framework to typeset web pages and ECharts for data visualization

Statistics and Prediction of COVID-19 Spread (*Group Leader*)   06/2021 - 08/2021
- Used Python with Scrapy framework to collect epidemic data, including areas and number of confirmed cases
- Figured out the source of infection based on the Naive Bayesian algorithm
- Used the TOPSIS model to evaluate epidemic prevention programs

Recruitment Website Data Mining (*Independent Project*)   06/2020 - 08/2020
- Used Python and Scrapy framework to crawl through 50,000 pieces of data, including position, salary, benefits, and region
- Cleaned the data to address the problems of data missing, abnormal and redundant, and stored data by using MySQL
- Visualized data through maps, bar charts and line charts and analyzed the data based on ECharts and Origin
- Used multiple linear regression model to anticipate job changes based on factors of location, salary, and job structure

EXTRACURRICULAR ACTIVITIES

Teaching Assistant for *Software Requirement Analysis*   08/2022 - Present
- Managed class attendance and supervised the learning progress of students
- Answered professional questions from students through in-class and after-class discussions
- Assisted the professor in arranging the class time and correcting course assignments

Student Leader of Grade   10/2019 - Present
- Arranged and implemented resolutions and tasks assigned by the college
- Made suggestions for the scientific research of the university as a student representative

Student Leader of Innovation Practice Group   09/2019 - Present
- Led the students to carry out scientific research activities, including academic experience sharing sessions, thesis writing guide, and lectures on big data expertise, to enhance the scientific research ability of students
- Led the class to carry out field research in the enterprise to understand the needs and difficulties of the current industry

COMPETITION AWARDS & HONORS

- Comprehensive Scholarship granted by Chongqing University (6%)   10/2022
- Excellent Student Leader granted by Chongqing University   10/2022
- Advanced Individual of Scientific and Technological Innovation granted by Chongqing University   10/2022
- Third Price in Programming Ability Competition granted by Chongqing University   10/2020
- Mathematical Contest in Modeling (Problem C, S) granted by COMAP   02/2020