Chao Li

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2001-11 male

EDUCATION

University of Chinese Academy of Science, National Space Science Center Sep 2022 - Jun 2025

Computer technology Master Beijing

Cumulative Grade Point Average: 3.57/4.0

Wuhan University Sep 2018 - Jun 2022

Computer Science and Technology Bachelor Wuhan, China

Cumulative Grade Point Average: 3.46/4.0 (84.89/100)

RESEARCH EXPERIENCE

DWTformer, a Time Series Prediction Model for Non-stationary Data Scenarios May 2024 - Present

Supervisor: Prof.Linlin Wang, Key Laboratory of Electronic Information Technology for Complex Space Systems, Chinese Academy of Sciences

- Designed the time series prediction model DWTformer tailored for non-stationary data scenarios.
- Decomposed the time series data into trend and frequency components using convolution operations. The trend component is predicted using the transformer model, while the frequency component is handled hierarchically through wavelet transform, effectively addressing the instability in both the trend and frequency.
- Conducted a comprehensive evaluation of DWTformer in comparison with several state-of-the-art forecasting models, and it demonstrated superior predictive performance across multiple public datasets.

Edge Device Deployment for FITS(Frequency Interpolation Time Series Analysis) Model Jul 2024 - Present

- Deployed the FITS model on edge computing platforms, with a specific focus on STM32F767 units.
- Constructed an intermediate ONNX transition file to reconfigure the FITS model for compatibility with X-CUBE-AI, addressing the absence of native support for Fourier operators. Configured the digital signal processor (DSP) to enhance the efficiency of Fourier transformations.
- Integrated wavelet transformation techniques to improve anomaly detection performance by reconstructing data and selectively discarding low-frequency detail coefficients.

Design and Verification of Spaceborne Universal Fault Detection, Isolation, and Recovery (FDIR) Platform Jul 2023 - Present

Supervisor: Prof.Liangqing Lv, Key Laboratory of Electronic Information Technology for Complex Space Systems, Chinese Academy of Sciences

- Developed a universal FDIR platform for satellite systems to enable autonomous in-orbit fault diagnosis and recovery, addressing the non-reusability of traditional FDIR designs.
- Designed two mechanisms: parameter monitoring, which imposes constraints on single on-orbit parameters (e.g. monitoring period and anomaly thresholds), and comprehensive monitoring, which involves multi-parameter anomaly detection to identify abnormal correlations between parameters.

Evaluation of Node Importance in Team Networks and Its Impact on Match Outcomes Mar 2020 - May 2020

Research Assistant, Supervisor: Prof.Guoliang He, Wuhan University

- Focused on analyzing team networks to identify key nodes and assess their impact on match outcomes. Network analysis techniques, including degree centrality, betweenness centrality, and eigenvector centrality, were employed to evaluate the significance of individual team members.
- Mainly responsible for the reproduction of the related literature.

CONFERENCE EXPERIENCE

The 37th National Symposium on Space Exploration Jun 2024

Oral Presentation for "Design of a general spaceborne FDIR monitoring platform". Changsha, China

OTHER RELATED EXPERIENCE

Curriculum Research: Least Mean Square Adaptive Filtering Step Size Parameter Optimization Nov 2022 - Feb 2023

Supervisor: Prof.Hao Zhang, University of Chinese Academy of Sciences

- Explored the impact of the step size parameter in Least Mean Squares (LMS) adaptive filtering on convergence speed, accuracy, and robustness. Specifically compared the performance of three strategies: fixed step size, variable step size, and super-optimized filtering.
- Achieved a perfect score of 4.0/4.0, while the research above and final exam each contributed 50% to the grade.

Engineering Test Work Experience Beijing

National Space Science Center

- Certain Satellite of Power Management Unit Controller Environment Simulation Test: Aging Test, Environmental Simulation Test.
- Testing of the Electrical Model for the Payload of Tianwen-2 Mission: Integrated Testing of Payload Electrical Component, Testing of the Payload Health Management Module.

SKILLS LIST

- Programming Languages: C/C++, Python
- Other Professional Skills: Linux, Pytorch, Embedded programming, Springboot, etc.

HONORS & AWARDS

The second prize of China College Student Computer Design Competition 2019

The first prize of Wuhan University Coding Marathon 2019

University level project of Innovation and Entrepreneurship for students of Wuhan University 2021