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 (84.6/100)

RESEARCH EXPERIENCE

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.

Time Series Prediction 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 time series prediction models tailored for non-stationary data scenarios.
- Employed Fourier transform on each patch based on the PatchTST model, aligning with the principles of short-time Fourier transform, and simultaneously applied frequency domain and time domain loss functions to mitigate autocorrelation in direct prediction paradigms.
- Utilized wavelet transform to leverage the information of both time and frequency domains, employing the transformer to fuse approximate coefficients across multiple parameters and applying a bottom-up fusion mechanism for the 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.

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.

CONFERENCE EXPERIENCE

The 37th National Symposium on Space Exploration   Jun 2024

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

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