Jingu Xie

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Education

Harbin Institute of Technology   *Weihai, China*
Mathematics and applied mathematics   *Sept 2021 - Current*
- GPA: 88.49/100
- GPA ranking: 13/41

Research Experience

Intermittent Boundary Control for Fixed-Time Stability of Reaction-Diffusion Systems   *Weihai, China*
Current State: Accept   *Sept 2022 - Feb 2024*
- Investigated the fixed-time stability of reaction-diffusion systems under aperiodically intermittent boundary control.
- The average control rate and a new Lyapunov function were proposed to overcome the challenges of handling the fixed-time stability of reaction-diffusion systems with aperiodically intermittent boundary control. Based on the Wirtinger's inequality and the Lyapunov method, a fixed-time stability criterion for a reaction-diffusion system with aperiodically intermittent boundary control was given.
- Two examples are discussed along with the simulated results to verify the effectiveness of the proposed method.

Practical Fixed-Time Intermittent Dynamic Event-Triggered Strategy for Multilayer Networks   *Weihai, China*
Current State: Revise   *Sept 2022 - current*
- Analyzed the practical fixed-time synchronization of multilayer complex networks.
- By using the key lemma, graph theory, the Lyapunov approach and introducing Intermittent dynamic event-triggered control to ensure the practical fixed-time synchronization of multilayer complex networks.
- Applied the main theoretical results to achieve practical fixed-time synchronization of multilayer coupled oscillator networks, and simulations are performed to validate the main results.

Prescribed-Time Stability of Complex Networks With/Without Time Delays Under Random Denial-of-Service Attacks   *Weihai, China*
Current State: Under Review   *Sept 2023 - current*
- Explored the prescribed-time stability of complex networks by examining scenarios with and without time delays under random denial-of-service attacks which occur during active intervals of attackers with a certain probability.
- Examined prescribed-time convergence under an intermittent framework, which is the first attempt in this direction. Furthermore, this allows users to freely designate the exact settling time for prescribed-time stability.
- Developed a prescribed-time stability criterion for complex networks by constructing a Lyapunov function using an auxiliary function, a high-gain function, and by leveraging stochastic analysis theory.
- the prescribed-time stability in oscillator systems subjected to random denial-of-service attacks was examined.

University Projects

Anomaly Detection and Trend Prediction in Intelligent Operation and Maintenance   *Weihai, China*
Project in freshman year   *Sept 2021 - Sept 2022*
- Taking the performance index of the base station KPI of the operator as the research data, the data is 67 KPI indexes corresponding to 58 cells covered by 5 base stations in 29 days from 00 on August 28 to 23:00 on September 25,2021.
- Selected three core indicators for analysis, which are the average number of users in the community, the sum of traffic and the average number of activated users.
- Learn the LOF algorithm, anomaly detection algorithm, isolated forest algorithm, DBSCAN algorithm for outlier value detection and abnormal period search; use a time series prediction analysis method to build a mathematical model for data prediction; choose regression analysis method, exponential smoothing method, weighted motion average method and other methods to establish various models, and use average absolute percentage error as the model evaluation index to analyze and optimize each model.

Product Management System Sesign based on Java   *Weihai, China*
                                                                                     Jan 2024 - Feb 2024
- Established the user information table for login queries. Designed the database according to the features of the product, including easily identifiable field names and data types.
- Analyzed the basic requirements of commodity management, and divide the functional modules that need to be realized.
- Wrote the front-end code and the back-end code according to the page requirements, realized the login function, the query according to product ID function, the product detailed information display function, the function of addition , modification and deletion of goods, and integrated these functions.

Honors and Awards

Mar.2024	**311/340,** Graduate Record Examinations (GRE)	*China*
Dec.2023	**Third Grade scholarship**, spring semester	*China*
Nov.2023	**Outstanding Student in Harbin Institute of Technology,** Obtained for excellent performance in academic Studies	*China*
Nov.2022	**Third Grade scholarship**, spring semester	*China*
Nov.2022	**Outstanding Student in Harbin Institute of Technology,** Obtained for excellent performance in academic Studies	*China*
2022	**Successful Participant,** Mathematical Contest In Modeling	*China*
Nov.2021	**Pass with Merit,** English Test for International Communication (ETIC) (Intermediate)	*China*

Publications

JOURNAL ARTICLES

Intermittent boundary control for fixed-time stability of reaction–diffusion systems
  Wenwen Jia, Jingu Xie, Haihua Guo, Yongbao Wu
  Chaos, Solitons & Fractals p. 114704. 2024

Skills

Programming	Matlab, Mworks, Python, C, HTML/CSS, JavaScript, SQL.
Miscellaneous	LaTeX(Overleaf/R Markdown), Spss, Microsoft Office.
Soft Skills	Time Management, Teamwork, Problem-solving, Documentation, Engaging Presentation.

Languages

Chinese	Mandarin, native
English	IELTS, 6.5

Hobbies

Sports	jogging, badminton, basketball, free combat
Art	dance, sing, draw, Guzheng,
Others	read books about mathematics, physics, philosophy, psychology

References available upon request.