



# NINGKANG ZHAO

Shanghai Jiao Tong University, Dongchuan RD., Shanghai, China

Nuclear Energy and Nuclear Technology Engineering

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## Education

- Shanghai Jiao Tong University 2022.09 - 2025.03  
Energy and Power Engineering Master
- Changsha University of Science & Technology 2017.09 - 2021.06  
Electrical Engineering and Automation Bachelor

## Publication

- [1] **N. Zhao**, M. Song, X. Zhang, W. Xu, X. Liu, Nanodiamond Coating in Energy and Engineering Fields: Synthesis Methods, Characteristics, and Applications. *Small*, 2401292.
- [2] W. Xu, L. Tang, **N. Zhao**, K. Ouyang, H. He, X. Liu, Corrosive Effect on Saturated Pool Boiling Heat Transfer Characteristics of Metallic Surfaces with Hierarchical Micro/Nano Structures. *Heliyon* 2024, 10 (8).

## Award & Honor

- Mar. 2024. Innovative Nuclear System Laboratory (INSL). Project Contribution Award
- Dec. 2023. Shanghai Jiao Tong University. Second-Class Scholarship
- Sept. 2023. 'Huawei Cup' the 20th China Graduate Mathematical Modeling Competition. Second Prize
- May 2021. Changsha University of Science & Technology. Outstanding Student Second-Class Scholarship
- May 2020. Selection of the Institute of Electrical Engineering for the 'Internet +' Innovation and Entrepreneurship Competition. Second Prize
- Dec. 2019. Changsha University of Science & Technology. Outstanding Student Third-Class Scholarship
- Dec. 2019. the Summer Vacation 'Volunteer activities for the country people'. Practice Exemplary Individual
- May 2019. 'Dianyuan Cup' Campus Electronic Design Competition. Best Creative Award

## Additional Experience

### Clinical intelligent diagnosis and treatment modeling of hemorrhagic stroke

Leader of mathematical modeling team

- Model builder:** Through the construction of BP neural network model and random forest network model, the clinical data of hemorrhagic stroke were learned, and the interaction between multiple parameters was coupled by multi-input method to predict the situation of edema and hematoma of



hemorrhagic stroke, and suggestions were made for intraoperative treatment and postoperative repair according to different conditions of different patients.

- **Algorithm Engineer:** By studying and analyzing the multi-parameter coupling relationship of hemorrhagic stroke, based on Spearman correlation coefficient, the random forest network model and BP neural network model were constructed, and the relevant factors of hemorrhagic stroke were screened by random forest algorithm and Spearman correlation coefficient, and then the evaluation indicators were predicted by BP neural network.

## Research on security situation awareness of main grid

Graduation project

- **Mapping of elastic network topology model:** Based on the elastic network topology model, the main network of power system is mapped to the elastic topology network model, and the presentation form of the main network parameters of power system is optimized to provide a new situational awareness method.

- **Power system main network scheduling optimization:** Through research and analysis of the above elastic network topology model, the active power evaluation network of power system is constructed based on the IEEE39 calculation example of Matpower in MATLAB, and the optimal scheduling mode in different power system faults is verified according to the above model.

## Household electricity portrait monitoring system

‘Internet +’ project

- **Electrical equipment type detection:** The harmonic power signals of different electrical equipment are learned by random forest algorithm, and different types of electrical equipment are identified and recorded in the client of different users for monitoring and use.

- **Client monitoring function design:** By studying and analyzing the consumption habits of different electrical equipment, based on the SQL database, different household consumption habits models were constructed and electricity consumption and cost were predicted according to real-time electricity prices, and electricity consumption suggestions were proposed to users mainly for ‘empty nest’ elderly people and unreasonable consumption habits.

## Smart blinds

Leader of ‘Dianyuan Cup’ project

- **Smart light blinds:** Through electronic components such as machine language and related photosensitive modules, a smart home device that can automatically adjust the tilt angle of the shutter according to the light intensity received by the light sensing module is developed.

## Language & Skills

- **Professional Skills:** Computer (National Computer Rank Examination Level 2);  $\text{\LaTeX}$ ; Adobe series (Photoshop, Illustrator, Audition, etc).
- **Language Skills:** IELTS(6.5); CET-6; Mandarin Level II, Level A.
- **Program Skills:** MATLAB; C; SQL (Understanding).