Xinyang Wang xinyang_uestc@163.com 2006 Xiyuan Ave, West Hi-Tech Zone, Chengdu, 611731

Proficient in: Programming Languages: MATLAB (5yrs), C++ (3yrs), Python (5yrs) | Operating Systems: Linux (3yrs)

Educational Background

University of Electronic Science and Technology of China, UESTC Chengdu, China
Master of Engineering in Control Science and Engineering | Overall GPA: 3.17/4.0 Sep 2021 – Jun 2024
Selected Courses: Pattern Recognition & Machine Learning, Computational Intelligence Theory and Method, Machine Learning, Optimization Theory and Applications, Artificial Intelligence in Well Logging Data Processing and Interpretation

Southwest University of Science and Technology, SWUST Mianyang, China
Bachelor of Engineering in Internet of Things Engineering | **Major GPA: 3.722/5.0**, Overall GPA: 3.629/5.0 Sep 2017 – Jun 2021

Selected Scholarships & Awards

Outstanding Academic Performance Scholarship for two years, UESTC Nov 2023 & Sep 2021
Outstanding Graduate Student, UESTC Sep 2022
Academic Potential Scholarship **(Rank: 10 out of 302, Ratio: 3%)**, UESTC May 2022
Outstanding Student Cadre, School of Information Engineering, SWUST Sep 2021
Science and Technology Innovation Scholarship **(Rank: 1 out of 400, Ratio: 0.25%)**, SWUST Oct 2020
Merit Student, School of Information Engineering, SWUST May 2020
Second Prize at Provincial Level, Huajiao Cup-National Mathematics Competition for College Students Apr 2019
First Prize in Second Complex Oil and Gas Reservoir Exploration and Development and Logging Technology Seminar July 2021
Second Prize in "NECCS," National English Competition for College Students, Class C **(Ratio: 3%)** May 2018

Publications

Xinyang Wang, Qiong Zhang, High-efficiency Monte Carlo simulation based on CADIS method for Gamma Density Measurement, Annals of Nuclear Energy, Volume 185, 2023, 109710, ISSN 0306-4549, https://doi.org/10.1016/j.anucene. 2023. 109710

Xinyang Wang, Jingang Liang, et al. Hybrid Monte Carlo methods for Geant4-based nuclear well logging implementation, Annals of Nuclear Energy, Volume 169,2022, 108824, ISSN 0306-4549, https://doi.org/10.1016/j.anucene. 2021. 108824.

Xinyang Wang, Shunli Wang, et al. A novel gaussian particle swarms optimized particle filter algorithm for the state of charge estimation of lithium-ion batteries. International Journal of Electrochemical Science, 2020(10). DOI:10.20964/2020.10.21.

Xinyang Wang, Jun-Yan Chen, Qiong Zhang, Boron shielding design for neutron and gamma detectors of a pulsed neutron tool, Nuclear Science and Techniques, 36, Article 16, 2025. DOI: 10.1007/s41365-024-01605-z.

Qiong Zhang, **Xinyang Wang,** New development of sensitivity improvement for compensated neutron porosity tool in gas-filled boreholes, Applied Radiation and Isotopes, Volume 185, 2022, 110216, ISSN 0969-8043. DOI: 10.1016/j.apradiso.2022.110216.

Qiong Zhang, Jingang Liang, **Xinyang Wang,** Dracarys: High-fidelity nuclear well logging benchmark problems with experimental results, Annals of Nuclear Energy, Volume 173, 2022, 109116. DOI: 10.1016/j.anucene.2022.109116.

Xinyang Wang (4/6), Development and verification of Geant4-based parallel computing Monte Carlo simulations for nuclear logging applications, Annals of Nuclear Energy, Volume 172, 2022, 109079, ISSN 0306-4549. DOI: 10.1016/j.anucene.2022.109079.

Xinyang Wang (6/7), GMAC: A Geant4-based Monte Carlo Automated computational platform for developing nuclear tool digital twins, Applied Radiation and Isotopes, Volume 192, 2023, 110579, ISSN 0969-8043. DOI: 10.1016/j.apradiso.2022.110579

Selected Research Experiences

Computational Modeling and Nuclear Detection Technology Laboratory

Project 1: Data-driven Inference and Response Modeling for Well Logging Systems Chengdu
Student Leader | Supervisor: Professor Qiong Zhang Oct 2022 - Nov 2024

- Built regression-based response models linking detector signals with physical parameters, supporting inverse estimation for complex engineering measurement systems.
- Preprocessed measured neutron/gamma signals using moving-average, Kalman-filtering, and Gaussian-smoothing workflows before response analysis and model validation.
- Applied Bayesian inference to estimate 13 elemental compositions from detector-response data. Modeled and separated capture-gamma and inelastic-gamma signal components to support formation-composition estimation.
- Validated response models with simulation and measurement data, focusing on algorithm interpretability, estimation accuracy, and consistency between simulated and real instrument responses.
- **Achievements:** published 1 SCI paper (refer to publications).

Project 2: Monte Carlo Variance Reduction and Parallel Simulation Optimization Chengdu
Participant | Supervisor: Professor Qiong Zhang Oct 2021 - Jun 2024

- Conducted large-scale Monte Carlo simulation and response modeling using Linux, Shell, C++, multi-threading, and MPI workflows.
- Studied and implemented CADIS-based importance sampling, weight-window variance reduction, and hybrid Monte Carlo acceleration methods to improve simulation efficiency.
- Converted deterministic importance-map results into Geant4 inputs through Shell-based data-conversion and interface workflows.
- Optimized batch execution, resource allocation, and thread/process configuration workflows for high-load simulation tasks.
- Integrated accelerated Monte Carlo methods into engineering simulation workflows for response analysis, algorithm validation, and computational design optimization.
- **Achievements:** published 3 SCI papers (refer to publications), delivered oral presentations at the 15th & 16th National Monte Carlo Conference, and completed 1 published invention patent application, "Density Logging Simulation Acceleration Method Based on Hybrid Monte Carlo".

Project 3: Physics-informed Parameter Fitting and Environmental Correction Algorithms Chengdu
Participant | Supervisor: Professor Qiong Zhang Oct 2021 - Apr 2023

- Developed physics-informed correction algorithms for neutron/gamma measurement systems, improving the calculation accuracy of density, porosity, and detector-response parameters under varying environmental conditions.
- Derived and transformed empirical and physics-guided formulas, using simulation and measurement data to calibrate uncertain coefficients and improve practical model expressions.
- Applied least-squares fitting, nonlinear regression, and sensitivity analysis to quantify relationships among detector responses, formation parameters, density, porosity, and structural effects.
- Investigated neutron transport and photon-interaction mechanisms, including scattering, thermal neutron capture, attenuation, and detector-response sensitivity under different material conditions.
- Implemented C++ based correction algorithms and preserved existing input/output interfaces for integration with simulation and measurement-processing software.
- **Achievements:** presented findings in 3 related papers and delivered an oral presentation at the Second Complex Oil and Gas Reservoir Exploration and Development and Logging Technology Seminar in Xi'an (2021).

Modeling and Optimization of Precise State of Charge (SOC) Estimation for Lithium Battery Packs Mianyang
Participant | Supervisor: Professor Shunli Wang, New Energy Measurement and Control Laboratory May 2019 - Jun 2021

- Developed equivalent circuit models for lithium battery packs based on Open Circuit Voltage (OCV) and Hybrid Pulse Power Characterization (HPPC) charge-discharge data, and validated the methods through Simulink simulations.
- Addressed the nonlinearity challenge in lithium iron phosphate batteries by employing particle filtering methods to predict battery SOC, and mitigated overfitting problems using particle swarm optimization algorithms.
- **Achievements:** presented findings in 1 paper (refer to publications), and participated in writing the book titled "Battery State Estimation: Methods and Models".

Work Experience

Algorithm Engineer, Energy Storage Product Line | TBEA Co., Ltd. Xi'an | Jul 2024 - Apr 2025

Project 1: BMS State Estimation, Balancing Control, and Fault-diagnosis Algorithms

- Designed and tested SOX/SOC-related algorithms for battery and battery-pack BMS, covering algorithm logic design, joint debugging, issue localization, and engineering validation.
- Participated in large-scale battery energy storage system algorithm development and maintenance, including state estimation, balancing control, fault diagnosis, state-machine logic, and integration testing.
- Analyzed operational constraints such as SOC ranges, power/current limits, safety thresholds, balancing conditions, and state-machine transitions, and translated them into validation cases for BMS/EMS algorithm testing.
- Conducted Simulink-based battery control algorithm testing and validation, focusing on interface consistency, boundary conditions, abnormal-data validation, and closed-loop verification.

Project 2: EMS Data Analysis and PV Power Forecasting for Solar-storage Operation

- Worked on EMS UI design and data-analysis workflows for solar-storage system operation, integrating PV generation, load, battery-state, and abnormal-operation data for system status analysis.
- Applied data mining and machine-learning methods to support EMS functions, system status analysis, and operational performance evaluation.
- Participated in PV output curve forecasting for solar PV plant operation, including generation-data processing, operating-condition feature analysis, model validation, and forecast-error analysis.
- Participated in preliminary edge-AI deployment testing on embedded boards for photovoltaic communication applications.

Selected Project Experiences

Competition | Huawei Challenge Cup – Intelligent Vehicle Path Planning, Obstacle Avoidance, and Control Jul – Aug 2022

- Designed and implemented motion control algorithms for the car, incorporating PID and fuzzy control to ensure stability and precision, and employed A* and Dijkstra algorithms for optimal path planning
- Developed car control and trading systems using C/C++ and Python, integrated and debugged with ROS (Robot Operating System)
- Optimized trading strategies using reinforcement learning algorithms to maximize system benefits within known maps
- Validated and enhanced the performance of the trading system through simulation and real-world testing

Course Design | Design and Optimization of High-resolution Rock Layer Identification Model Apr – Jun 2022

- Applied filtering and denoising algorithms (e.g., wavelet transform, Kalman filtering) to clean the logging data, carried out the standard processing of logging data to unify the data scale
- Constructed a convolutional neural network (CNN) to process high-resolution features of logging data, extracted effective feature as model input, trained the model, optimized hyperparameters, evaluated the model's generalization ability through cross-validation
- Assessed model performance with metrics including confusion matrix, accuracy, recall rate and F1 score, optimized the model by adjusting the number of network layers and optimization algorithms
- Employed ensemble learning to integrate the results of multiple models to enhance the overall recognition effect

Course Design | Rock Classification Model Construction for Efficient Logging Data Analysis Sep 2021 – Feb 2022

- Cleaned logging data and extracted features, applying normalization and Principal Component Analysis (PCA) for pre-processing
- Employed Support Vector Machine (SVM) and random forest for model training, adjusted hyperparameters, identified the optimal parameters through grid search and cross-validation methods
- Compared the effects of different machine learning algorithms, applied k-fold cross validation to assess model stability and generalization ability, conducted automatic tuning of hyperparameters, utilized confusion matrix to analyze the classification results and identify misclassifications and potential areas for improvement