Supongmen Walling

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Data Scientist

PhD-level Data Scientist with 5+ years of experience in developing machine learning models, statistical forecasting, and large-scale data analytics. Skilled in Python, SQL, Scikit-learn, and PyTorch with strong experience in anomaly detection, time series analysis, and optimization. Passionate about driving business impact through data-driven planning in cloud-scale systems.

WORK EXPERIENCE

ICFAI University **01/2025 - 05/2025**
Guest Faculty **Nagaland, India**

•Delivered lectures on specialized subjects such as Information Security and Cyber Laws, covering both technical foundations and legal frameworks relevant to modern cybersecurity challenges.

National Institute of Technology **04/2021 - 05/2025**
Teaching Assistant **Nagaland, India**

•Conducted lectures, practical sessions, and evaluations, ensuring alignment with academic standards and student learning objectives.

•Mentored students on projects and research topics related to cybersecurity and intelligent systems.

Senior Research Fellow **Nagaland, India**

•Proposed and implemented novel adaptive feature selection methods to improve detection performance while minimizing computational overhead.

•Evaluated and optimized lightweight ML models using benchmark intrusion detection datasets (e.g., NSL-KDD, UNSW-NB15, CICIDS-2017, BoT-IoT etc) for IoT security applications.

•Published and presented 5+ papers in reputed peer-reviewed journals and conferences, contributing to advancements in secure IoT systems.

•Processed large-scale benchmark datasets (CICIDS, UNSW-NB15) using Python and optimized for performance, simulating big data environments with parallel processing tools.

Junior Research Fellow **Nagaland, India**

•Conducted an in-depth literature review on machine learning-based IDS approaches for IoT, identifying research gaps and state-of-the-art techniques.

•Designed and implemented initial prototypes of anomaly-based IDS models optimized for low-resource IoT devices.

•Performed comprehensive data preprocessing and exploratory data analysis (EDA) to support robust ML model development and evaluation.

ICFAI University **01/2020 - 07/2021**
Assistant Professor **Nagaland, India**

•Delivering undergraduate and postgraduate-level courses in computer science.

•Supervising undergraduate and postgraduate students in research projects and theses.

Indian Institute of Engineering Science and Technology **01/2018 - 05/2019**
Teaching Assistant **West Bengal, India**

•Assisting faculty members with undergraduate courses in computer science and engineering.

•Leading lab sessions, discussion groups, and tutorials to reinforce course material and provide hands-on learning experiences.

EDUCATION

PhD in Computer Science and Engineering
National Institute of Technology — Nagaland, India•04/2021 - 05/2025

Design and development of lightweight unified network intrusion detection systems for attack classification in smart environments

M.Tech in Computer Science and Engineering
Indian Institute of Engineering Science and Technology — West Bengal, India•07/2017 - 05/2019

Developed a real-time, low-cost IoT-based air pollution monitoring system using LoRa.

B.Tech in Computer Science and Engineering
National Instituteof Technology — Nagaland, India•07/2013 - 05/2017

Developed A robust password generator for user authentication in cloud computing

CERTIFICATIONS

UGC NET 2020 11/2020
GATE (CSE) 2019 03/2019
GATE (CSE) 2017 03/2017
Core Java, HP 2015 2015

AWARDS & SCHOLARSHIPS

Class 10 State Topper
Australian Chemistry Quiz 1st Runner Up

PROJECTS

Lightweight IDS for IoT Networks
04/2021 - 05/2025

Designed and implemented a lightweight anomaly-based Intrusion Detection System (IDS) for IoT networks using Python, scikit-learn, and pandas, integrating a novel feature selection method, A2N-SFS (Advanced Adaptive Neighborhood-based Statistical Feature Selection). A2N-SFS is a dynamic and adaptive technique that selects relevant features based on local statistical relationships, enhancing detection accuracy and reducing computational overhead for real-time intrusion detection.

Movie Recommender

This project is a content-based movie recommendation system built using Python, Pandas, and scikit-learn. It employs **K-Nearest Neighbors (KNN)** and a sparse user-item rating matrix to suggest movies similar to a user's top-rated selection. By calculating cosine similarity between movies based on user ratings from the MovieLens dataset, the system identifies and recommends titles that closely match individual preferences. The model combines content-based filtering with collaborative elements for improved relevance. To make the system accessible, it is deployed using a **Flask API**, allowing users to interact with the recommendation engine through HTTP requests and receive real-time movie suggestions.

Heart Disease Risk Prediction Using Machine Learning

Developed a machine learning model to predict 10-year risk of heart disease using the Framingham Heart Study dataset. The project involved data preprocessing, handling missing values, and addressing class imbalance using the **ADASYN (Adaptive Synthetic Sampling)** technique. A **Random Forest classifier** was trained to identify individuals at risk, with model performance evaluated using metrics such as accuracy, precision, recall, F1-score, and ROC-AUC. The pipeline was implemented using **Python**, with key libraries including **pandas**, **scikit-learn**, and **imbalanced-learn**, ensuring robust and interpretable results for healthcare risk assessment.

Horse Race Outcome Prediction Using Machine Learning

Developeda machine learning pipeline topredict horse racewinners using real-world race and horse performance data. The project involved merging multiple datasets, parsing complex fields (e.g., race distance and time), engineering date-related features, and cleaning financial and categorical variables. Applied preprocessing using scikit-learn pipelines with imputation, scaling, and one-hot encoding. Trained a **Random Forest classifier** with hyperparameter tuning and class balancing, achieving strong performance in predicting race outcomes. The model was evaluated using accuracy and classification metrics, and feature importance was analyzed to interpret model behavior. Technologies used include **Python**, **pandas**, **scikit-learn**, and **NumPy**.

VOLUNTEERING & LEADERSHIP

NIT Nagaland 01/2015 - 01/2016

Cultural Secretary

Peer-Reviewed Journals (Springer) Since 11/24

Research Paper Reviewer

PUBLICATIONS

A2N-SFS: an advanced statistical adaptive feature selection method for enhancing intrusion detection systems in IoT systems

Springer

Knowledge and Information Systems, https://link.springer.com/article/10.1007/s10115-025-02540-0

An Extensive Review of Machine Learning and Deep Learning Techniques on Network Intrusion Detection for IoT.

Wiley, Transactions on Emerging Telecommunications Technologies

Walling, S. and Lodh, S. (2025), Trans Emerging Tel Tech, 36: e70064. https://doi.org/10.1002/ett.70064

Network intrusion detection system for IoT security using machine learning and statistical based hybrid feature selection.

Wiley, Security and Privacy

Walling S, Lodh S. Security and Privacy. 2024; 7(6):e429. doi: 10.1002/spy2.429

Enhancing IoT intrusion detection through machine learning with AN-SFS: a novel approach to high performing adaptive feature selection.

Springer Nature, Discov Internet Things

Walling, S., Lodh, S. Discov Internet Things 4, 16 (2024). https://doi.org/10.1007/s43926-024-00074-5

Network Intrusion Detection System for Smart Environments with High performing Novel Feature Selection Approach

IEEE

S. Walling and S. Lodh, 2024 Global Conference on Communications and Information Technologies (GCCIT), BANGALORE, India, 2024, pp. 1-6, doi: 10.1109/GCCIT63234.2024.10862616.

Multifactor Mutual Authentication of IoT Devices and Server

IEEE

N. Odyuo, S. Lodh and S. Walling, 2023 5th International Conference on Smart Systems and Inventive Technology (ICSSIT), Tirunelveli, India, 2023, pp. 391-396, doi: 10.1109/ICSSIT55814.2023.10061113.

A Survey on Intrusion Detection Systems: Types, Datasets, Machine Learning methods for NIDS and Challenges

IEEE

S. Walling and S. Lodh, 2022 13th International Conference on Computing Communication and Networking Technologies (ICCCNT), Kharagpur, India, 2022, pp. 1-7, doi: 10.1109/ICCCNT54827.2022.9984320.

Pulmonary Nodule Detection in Computed Tomography Images Using Deep Learning
IEEE
A. Longkumer, S. Walling and S. Kalita, 2023 International Conference on Advances in Electronics, Communication, Computing and Intelligent Information Systems (ICAECIS), Bangalore, India, 2023, pp. 384-389, doi: 10.1109/ICAECIS58353.2023.10170361.

A Low-cost Real-time IoT based Air Pollution Monitoring using LoRa
IEEE
S. Walling, J. Sengupta and S. Das Bit, 2019 IEEE International Conference on Advanced Networks and Telecommunications Systems (ANTS), Goa, India, 2019, pp. 1-6, doi: 10.1109/ANTS47819.2019.9117963.

A Comprehensive Review on Security Attacks and Countermeasures in IoT Environment.
Springer Walling, S., Lodh, S. (2023). In: Joshi, A., Mahmud, M., Ragel, R.G. (eds) Information and Communication Technology for Competitive Strategies (ICTCS 2022). ICTCS 2022. Lecture Notes in Networks and Systems,
vol 623. https://doi.org/10.1007/978-981-19-9638-2_53

SKILLS

Languages & Frameworks: C, C+ + , Java, Python, SQL

ML/AI Libraries: Matplotlib, NumPy, Pandas, PyTorch, Scikit- learn, Seaborn, Streamlit, TensorFlow

Data & Developer Tools: Apache Spark Hadoop Git, Arduino, Databricks, Flask API, Git, Google Colab, Jupyter, MATLAB, Microsoft Azure, Power BI, PowerPoint, PyCharm, Tableau, VS Code, Wireshark

Databases: MongoDB, MySQL

Machine Learning Techniques: Anomaly Detection, Classification, Regression, Feature Engineering, Feature Selection, Model Evaluation

Technologies: Deep Learning, Intrusion Detection Systems, IoT, Machine Learning

Soft Skills: Communication, Mentoring, Rapport Building, Team Leadership, Technical Writing

Spoken Languages: English, Hindi

Big Data Tools (Academic Exposure): Apache Spark, Hadoop

LANGUAGES KNOWN:

English • Hindi