QIUYI HONG

www.qiuyihong.com | qiuyi.hong.q.y@gmail.com | +44 7927164256 | qiuyi-hong | Qiuyi-Hong | Google Scholar

EXPERIENCE

Data Scientist

heatly

October 2025 – March 2026 | Leeds, United Kingdom

- Built a complete autonomous ETL pipeline to provide the necessary data for the company's database: extracting data from various sources, such as PDFs and charts, via LLMWhisperer, the OpenAI API, and WebPlotDigitizer. Transforming the raw data into structured data using Python (Pandas). Storing the structured data in a database using SQL.
- Developed a full-stack web application using Node.js to estimate and compare operational costs for customers using a heat pump and a gas boiler for heating. Customers' energy consumption and weather data are extracted from their smart meter via the Glow API and the Open-Meteo API.

Postdoctoral Research Associate in Data Science

School of Engineering, Newcastle University

August 2024 – October 2025 | Newcastle upon Tyne, United Kingdom

- Quantify and evaluate the value of low-carbon technologies, such as solar panels, electrical and thermal storage systems, and heat pumps, within the smart home energy management system (SHEMS) framework.
- Review and evaluate the roof-rental mechanisms in the UK and internationally and propose the potential research directions and technologies for further improvement.

Data & Analytics Intern

Essex County Council

April 2024 – June 2024 | Chelmsford, United Kingdom

- Analysed the dependence between the demand for services (i.e., Waste and Recycling, Children and Adults Social Care, and Highways) and corresponding complaints received by the Essex County Council using Granger Causality Test and Distance Correlation. The data preprocessing and analysis are implemented in R and RStudio.
- Examined and visualised different measures for each district in Essex, such as Business, Economy and Industry, Education and Skills, Population and Community Information, Health and Social Care, and Road and Transportation, using Power BI. Economic Digest

Research Officer

University of Essex, School of Mathematics, Statistics and Actuarial Science

April 2023 – July 2023 | Colchester, United Kingdom

- Developed dynamic programming and Dijkstras-based algorithms using Python to solve the shortest path problem with multiple destinations.

Assistant Lecturer

University of Essex, School of Mathematics, Statistics and Actuarial Science

October 2021 – April 2023 | Colchester, United Kingdom

- Taught machine learning techniques (e.g., regression, classification clustering) in *Statistical Methods*, *Modelling Experimental Data* and *Applied Statistics*.
- Taught to code each algorithm using R and RStudio and marked assignments.

Research Assistant

University of Essex, School of Mathematics, Statistics and Actuarial Science

April 2022 – July 2022 | Colchester, United Kingdom

- Developed a novel mixed-integer linear programming (MILP) model for optimal energy allocation and pricing under the uncertainty of renewable energies using MATLAB. It solved it using a genetic algorithm (GA).

Lecturer

Office of Student (OfS) & University of Essex, School of Mathematics, Statistics and Actuarial Science & School of Computer Science and Electronic Engineering

February 2022 – April 2022 | Colchester, United Kingdom

- Worked with a multi-disciplinary team to develop Data Science and AI Short Courses for data analysts at local companies, including *Introduction to Statistical Analysis and Data Science in R*, *Visualisation in R*, and *Predictive Modelling*.

Graduate Lab Assistant, Data Science Bootcamp

University of Essex, Department of Social Sciences

September 2021 | Colchester, United Kingdom

- Taught students to code various statistical and machine learning algorithms, such as regression, classification, and clustering in Python and R. Introduced various Python scientific libraries, such as NumPy, Pandas, SciPy, and Matplotlib.

EDUCATION

Ph.D. in Data Science

University of Essex, School of Mathematics, Statistics and Actuarial Science

October 2020 – July 2024 | Colchester, United Kingdom

- Developed a smart hierarchical transactive energy system that considers multi-energy, renewable energies and demand side management using bilevel optimisation models and metaheuristics approaches, such as GA, particle swarm optimisation (PSO) and simulated annealing (SA) algorithms.
- Developed a Transformer-based long-term time-series forecasting model for multi-energy load prediction using PyTorch.

M.Sc. in Banking and Finance

University of Sussex, Sussex Business School

September 2018 – September 2019 | Brighton, United Kingdom

- Grade: Distinction (79%)
- The magnitude of the impact of crude oil prices' shock on different commodity markets: evidence from DCC-GJR-GARCH model

SKILLS

Python | FastAPI | LLMs | LangChain | LangGraph | LangSmith | RAG | JavaScript/TypeScript | SQL | NLP | AI Engineering | Full-Stack Web Development | Software Engineering | PyTorch | TensorFlow | Pyomo | MATLAB | R | LaTeX | Machine Learning | Deep Learning | Transformers | Time Series Forecasting & Analysis | Computer Vision | Operational Research | Metaheuristic Algorithms | Energy Markets | Power BI

PUBLICATIONS

Optimal Operation of Air-Source Heat Pump-based Heating Systems for Dwellings: A Thermal Network Approach | IEEE ISGT Europe 2025

Authors: Qiuyi Hong, David Greenwood, Matthew Deakin, Shahab Dehghan

- This paper leverages thermal network theory to introduce a model for the cost-effective operation of a heating system with an air source heat pump (ASHP) and thermal energy storage (TES) to supply both space and domestic hot water (DHW) heating for a single home.

A Review of UK and International Business Models for Rooftop Solar PV Systems to Optimise Solar Energy Adoption | CIRED 2025 conference

Authors: Qiuyi Hong, Saman Nikkhah, Damian Giaouris, Vladimir Terzija, Shahab Dehghan

- This paper comprehensively reviews different business models for rooftop solar photovoltaic (PV) systems to promote solar energy adoption in the UK and beyond.

A smart hierarchical transactive energy system in the presence of renewable energies, and demand-side management | University of Essex

- PhD thesis which 1) analyses a game-theoretic decision-making model for energy retailers' strategic bidding and offering problem while considering customers' switching behaviour; 2) introduces a customised multi-energy pricing scheme; 3) develops an innovative forecasting model named Patchformer, based on Transformer-based architectures and patch embedding method, for the prediction of long-term multi-energy loads.

Advancing Long-Term Multi-Energy Load Forecasting with Patchformer: A Patch and Transformer-Based Approach | arXiv

Authors: Qiuyi Hong, Fanlin Meng, Felipe Maldonado

- The proposed Patchformer is a novel model that integrates patch embedding with encoder-decoder Transformer-based architectures for long-term time-series forecasting to predict multi-energy loads using PyTorch. Numerical analysis shows it outperforms many state-of-the-art models for multivariate and univariate forecasting tasks.

A bilevel game-theoretic decision-making framework for strategic retailers in both local and wholesale electricity markets | Applied Energy

Authors: Qiuyi Hong, Fanlin Meng, Jian Liu, Rui Bo

- Proposed a bilevel optimisation model to support energy retailers' decision-making. The bilevel model was solved by diagonalisation algorithm and coded in Python and its scientific libraries, such as Pyomo, NumPy, Pandas, and Matplotlib.

Customised Multi-Energy Pricing: Model and Solutions | Energies

Authors: Qiuyi Hong, Fanlin Meng, Jian Liu

- Proposed a bilevel MILP model to formulate the energy retailer's customised multi-energy pricing decisions, solved by GA, particle swarm optimisation (PSO) and simulated annealing (SA) algorithms in MATLAB.

Customized Multi-energy Pricing in Smart Grids: A Bilevel and Evolutionary Computation Approach | Advances in Intelligent Systems and Computing, Springer

Authors: Qiuyi Hong, Fanlin Meng

ACHIEVEMENTS

Best Student Award
Accounting & Finance prize for the Best Student in MSc. Banking and Finance

CONFERENCES

CIRED 2025

June 2025 — Geneva, Switzerland

- Presented my paper in the poster session.

PES Summer School – Future Energy Systems: Advances in OR and AI

The Technical University of Denmark

June 2023 — Copenhagen, Denmark

The 21st UK Workshop on Computational Intelligence (UKCI 2022)

University of Sheffield

September 2022 — Sheffield, United Kingdom

- Presented the paper: Customized Multi-energy Pricing in Smart Grids: A Bilevel and Evolutionary Computation Approach

Putting Net Zero into Action: addressing the implementation gap (UKERC 2022)

UK Energy Research Centre

June 2022 — Manchester, United Kingdom

- Nominated to present in the poster session.

CERTIFICATIONS

- Data Engineer in Python
  DataCamp

  Topics: Data Engineering, ETL, Apache Airflow

- Associate Data Engineer in SQL
  DataCamp

  Topics: Data Engineering, SQL

- Deep Learning Specialization
  Coursera

  Topics: Deep Learning, multilayer perceptron (MLP), CNN, NLP, RNN, LSTM, GRU, Transformers

- Data Science: Transformers for Natural Language Processing
  Udemy

  Topics: Transformer model, Python, PyTorch

- Machine Learning
  Coursera

  Topics: Regression, Classification, Clustering, Deep Learning, Neural Networks

- Mathematical Optimisation for Engineers
  edX

  Topics: Linear Optimisation, Nonlinear Optimisation, Mixed-integer Optimisation, Global Optimisation, Dynamic Optimisation

- Operations Research
  Coursera

  Topics: Linear Programming, Mixed-integer programming

- Introduction to Computer Science and Programming Using Python
  edX

  Topics: Python, Data Structures, Testing, Debugging

- Complete Linear Algebra: Theory and Implementation in Code
  Udemy

  Topics: Linear Algebra, MATLAB

- Mathematics for Machine Learning
  Coursera

  Topics: Linear Algebra, Multivariate Calculus, PCA

- IBM Data Science
  Coursera

  Topics: Python, Machine Learning, Data Visualisation, Databases, SQL

- Python for Everybody
  Coursera

  Topics: Python Data Structures, Access Web Data with Python, Databases with Python