# Manoj Manivannan

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## Professional Experience

**Infovista Ltd UK** — **March 2023 to Present**
Guildford, United Kingdom
**Data Analyst Engineer + Tech Lead -** ***Data analytics & Gen AI Dev***

- Leading *research & development* of **chatbot** using **Generative AI** and **LangGraph-LangChain** framework.
- Led *design*, *development,* and *integration* of *data adapters*, *analytic metrics/KPIs* and *aggregators* in **Cloud native** application to consume google protocol buffer SIP stream and provide *business insights/reports* on STIR/SHAKEN for telecom CSPs, generating sales of around **$2M** in **18months**.
- *Troubleshooting* and *root cause analysis* of data integrity failures on customer AWS clusters + *create/modify* CI/CD pipelines for development.
- Data transformation troubleshooting on **postgres** and **clichouse** DB on AWS cluster.
- Scrum master since 2020 & Tech lead of Solution packages (Customer offerings) development.

**Infovista Italy S.R.L (formerly Empirix Italy S.R.L), Italy** — **February 2018 to March 2023**
Modena, Italy
**Data Analyst Engineer + Tech Lead -** ***Data analytics & visualization***

**Data Analytics & Optimization for Energy Applications Laboratory,** — **October 2016 to October 2017**
Politecnico di Milano, Piacenza, Italy

**Research Assistant** – ***Machine learning, Smart meter Data analytics and Data Science***

- Data extraction from public dataset, Data Cleaning and analytics using Python:pandas.
- **Developing a data-driven model** to **forecast** the behaviour of **HVAC** systems with around 85% accuracy benefitting cost savings around 5% for energy providers serving smart grids.
- **Time series analysis:** Neural Networks, Regression

**ElektroThermalKinetics Pvt Ltd,** — **April 2013 to June 2014**
Chennai, India
**Engineer** – ***Project Manager***

- Technical consultant, Design, & engineering of research equipment for combustion applications at IIT, Madras

## Education

**M.Sc. Energy Engineering (Renewables and Sustainability)** — **September 2014 to October 2017**
Politecnico di Milano, Piacenza, Italy

- Energy systems, industrial heat & power technologies, Low carbon technology and renewables, Electric conversion of renewable energy sources using wind and solar power.
- Data analytics on Building Energy Management Systems dataset using pandas

**B.Sc. Mechanical Engineering** — **June 2008 to August 2012**
Anna University, Chennai, India

- Computational Fluid Dynamics, HVAC systems for buildings, Finite Element Analysis

## Skills

- Python (***Packages*****:** Scikit-learn, pandas, numpy, matplotlib, PyTorch)
- SQL (Postgres, Clickhouse)
- Shell scripting

**Operating System:** Windows & Linux
**Experience with tools**: Docker, Maven, AWS & Kubernetes, GCP Basics, GCP Data Engineering, Apache Spark & Airflow fundamentals.

## Personal Projects

- Data Science:
  - Data visualization & prediction on several data sets including COVID-19 & Bike sharing. Here .
  - Basics of machine learning using PyTorch and deployment
- Gained knowledge on CI/CD by developing from scratch, a cloud native application to track the International Space Station. Click to check the Gitlab hosted project.

**Academic Projects**

**M.Sc. Thesis: Machine learning-based prediction of HVAC load by smart meter analytics**

- Using open-source toolkits to build a model using NILM (Non-Intrusive Load monitoring) techniques and machine learning to estimate demand response by forecasting energy usage of HVAC systems using publicly available datasets. Perform data extraction, cleaning and transformation using pandas. Techniques and tools include Python, scikit-learn, especially neural networks, Random Forest decision tree and SVM. The aim is to reduce user utility costs without comprise of comfort. Enabling demand identification for the smart grid and reduction of primary energy source.

**Energy & Environmental technologies for building systems**

- Implementation of Residential Load Factor (RLF) method in Python™ by using Openpyxl library for MS Excel database and employing the developed code for determining the heating & cooling loads of a small detached residential house using EnergyPlus® via OpenStudio™ to analyse the yearly energy consumptions of a multi-story commercial building with specific application & location. The analysis included different thermal zones, user defined construction sets and schedules. VAV with reheat HVAC system was incorporated for all thermal zones. A sensitivity analysis based on the effects of location, window properties and external wall characteristics was also performed.

**IoT smart incubator**

- In-house smart incubation unit with DS18B20 temperature sensor, LDR GL5516 photo resistor, 40W heating unit, ventilation, TowerPro SG90 servo motor connected to a Raspberry Pi 3 (GPIO) ports and coded using Python. On-demand ambient conditions maintenance with quick variability and 0.5°C sensitivity.

**B.Sc. Thesis: Computer Aided Design of Heat Exchangers**

- Developed a code using Microsoft® Visual Basic 8® for thermal & hydraulic sizing for a segmentally baffled shell and tube Heat exchanger. Generated a 3D Model using Autodesk® Inventor® from the output of the computed results from the code. Industrial and TEMA standards where obeyed and incorporated in the software.

**Awards**

- **Winning Team** of an innovation contest for international students from engineering and business backgrounds organised by **ASTER** in collaboration with **ER.GO** and launched by **VERTIV** (Emerson Network Power) at **Research to Business 2017** (12th International Exhibition on Industrial Research and Competences for Innovation), Bologna, Italy. Secured €1000 reward for the most creative and feasible business strategy.
- Recipient of **Gold scholarship** (complete waiver) for the 2-year master's degree at Politecnico di Milano, Italy
- Event Manager in INGENIOUS' 12- A National Level Design Competition organized by the Society of Mechanical Engineers at Rajalakshmi Engineering College, Chennai, India.

**Publication**

Machine learning based short-term predictions of air-conditioner loads through smart meter analytics, Article: Energies Journal MDPI, 2017. Link to publication

**Languages**

- English – Professional proficiency
- Italian – Intermediate
- Tamil – Native speaker