Manoj Manivannan

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Professional Experience

Infovista SAS (formerly Empirix S.R.L), Italy — **February 2018 to Present**
Modena, Italy

Data Analyst Engineer – ***Data analytics & Validation***

- *Design*, *build* and *integrate* input adapters, *analytic metrics/KPIs* and *aggregators* to consume google protocol buffer data and *provide business insights/reports* on telecom network health and operation for service providers using in-house proprietary cloud native software.
- *Led* a team of business analysts and developers in designing telecom Solution packages (data visualizations/dashboards for service providers) in under 3 months.
- Validate integrity (sanity checks) of data using python Behave framework.
- Scrum master since 2020 for a team of four business analyst, one C++ developer and four testers from quality assurance. Managing the progress of Solution packages (Customer offerings) development.

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***

- **Developing a data-driven model** to simulate and **forecast** the behaviour of **HVAC** systems with around 85% accuracy.
- **Energy disaggregation**, Non-Intrusive Load Monitoring, Building energy performance.
- **Time series analysis**, scikit-learn, Random Forest, SVM, MLP – Neural Networks, Regression

ElektroThermalKinetics Pvt Ltd, — **April 2013 to June 2014**
Chennai, India

Engineer – ***Engineering, Procurement and Construction***

- Design, simulations, and engineering of research equipment of combustion applications at IIT, Madras.
- Technical consult, finalize requirement and end-to-end project management.

Education

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

- Environmental building technologies
- Energy systems, industrial heat & power technologies
- Low carbon technology and renewables
- Electric conversion of renewable energy sources

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

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

Skills

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

Operating System: Windows & Linux
Tools: Docker, Maven, SQL

Personal Projects

- Time series prediction using AutoML machine learning library TPOT of the Air quality Dataset.
- Data visualization of several data sets including COVID-19 and Bike sharing. Check here
- Gained knowledge on development, CI/CD & deployment by developing from scratch a cloud native application to track the International Space Station. Click to check the Gitlab hosted project. Tools used: **Python**, **Maven**, **Shell scripting** and **Docker**

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. 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