


MAYSAA KHALIL

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OBJECTIVE


Seeking a position in the field of machine learning, deep learning, data analysis, and visualization applications.

EDUCATION

PhD Student

University of Technology of Troyes

 October 2019- October 2022


 Troyes, France


Automated Thermal Comfort with Energy Constraints in Smart Buildings

- Develop a machine learning algorithm for predicting thermal comfort inside smart buildings.
- Compare between different machine learning algorithms to demonstrate our choice.
- Develop a centralized IoT environment in smart buildings to control thermal comfort while maintaining energy efficiency.
- Develop a distributed approach using federated learning to perform deep learning algorithms on the edge.
- Develop different selection protocols for clients in the federated learning approach.
- Design an optimal energy efficient communication and transmission protocol for the federated learning approach under 5G (NOMA and OFDMA)
- Predict the load consumption and the thermal comfort state in smart buildings.
- Control the building via the aid of federated learning leading to less energy consumption.
- Design a more secure federated learning approach against malicious attacks with differential privacy.
- ...

Master Electrical Engineering for Smart Grids and Buildings

Grenoble INP ENSE3


 August 2018- July 2019

 Grenoble, France

Bachelor's in Computer Science

Lebanese University, Faculty of Sciences

 October 2015- July 2017


 Beirut, Lebanon

EXPERIENCE

Data Analyst Intern

Laboratoire d'Informatique de Grenoble


 February 2019, July 2019


 Grenoble, France

- Generate data-driven analysis in order to profile a household based on their Energy Efficiency metrics.
- Document the conclusion and findings of these analysis.
- Set up a data science virtual machine.
- Set up data storage and persistence strategies.
- Develop a strategy for Bad data detection and replacement.
- Develop a forecast model based on a described experiment.
- Generate outputs based on the developed model: CO2 emissions and energy consumption metrics.

IoT Developer

G2Elab

 July 2018, September 2018

 Grenoble, France

- Provide the connection between sensors and the smartphone application via the SensiNact platform.
- Collect data by HTTP Influxdb.
- Provide the connection to the weather station.
- Calculation and Display of auto-consumption and auto-production inside the building.

- Test and deployment the application which is responsible for energy management inside GreenER building.

PERSONAL PROJECTS

Testing building energy management strategies

GSCOPE

 July 2018, January 2019  Grenoble, France

- The work was done to improve a smart thermostat developed by Quby company based in Amsterdam.
- Develop and implement an machine learning model to be used in implementing a robust and improved control algorithm for the thermostat.
- Available data from an apartment situated in Amsterdam was used to develop a physical model of the space heating system.
- The model developed could predict the temperature in the apartment and achieve the thermal comfort sensation.

Smart Greenhouse

Grenoble INP ENSE3

 February 2018, June 2018  Grenoble, France

- This engineering project deals with the connected MyFood greenhouse on the roof of the ENSE3.
- Production and self-consumption of energy;
- Motorization and automatizing of a window to regulate the temperature inside the greenhouse;
- Monitor the different sensors in the greenhouse (pH, redox potential, temperatures, dissolved oxygen).
- Data are managed thanks to a Raspberry card and the communication protocol Sigfox.

SKILLS

Python

Machine learning python libraries

Deep learning python libraries

Data analysis python libraries

Data visualization python libraries

SQL

Matlab

C/C++

Java

HTML/CSS

Shell

Latex

Docker

PUBLICATIONS

- Khalil, Maysaa, Moez Esseghir, and Leila Merghem-Boulahia. "An IoT environment for estimating occupants' thermal comfort." In 2020 IEEE 31st Annual International Symposium on Personal, Indoor and Mobile Radio Communications, pp. 1-6. IEEE, 2020.
- Khalil, Maysaa, Moez Esseghir, and Leila Merghem-Boulahia. "Applying IoT and Data Analytics to Thermal Comfort: A Review." Machine Intelligence and Data Analytics for Sustainable Future Smart Cities (2021): 171-198.
- Khalil, Maysaa, Moez Esseghir, and Leila Merghem-Boulahia. "Federated Learning for Energy-Efficient Thermal Comfort Control Service in Smart Buildings." In 2021 IEEE Global Communications Conference (GLOBECOM), pp. 01-06. IEEE, 2021.
- Vargas-Solar, Genoveva, Maysaa Khalil, Javier A. Espinosa-Oviedo, and José-Luis Zechinelli-Martini. "Greenhome: a household energy consumption and CO2 footprint metering environment." ACM Transactions on Internet Technology (TOIT) 22, no. 3 (2022): 1-31.
- Khalil, Maysaa, Moez Esseghir, and Leila Merghem-Boulahia. "A federated learning approach for thermal comfort management." Advanced Engineering Informatics 52 (2022): 101526, Elsevier.

LANGUAGES

English
Français
Arabic



INTERPERSONAL SKILLS

Team player

Good time management

Leadership skills

HOBBIES

Hiking

Pétanque

Ice skating