



Internship Program 2024  
Advancing the IoT Benchmarking and Performance  
Analysis (IBPS) Platform  
October 27, 2023

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## Project Description

The IoT landscape has witnessed a transformative growth, with approximately 15.14 billion connected devices [1] reshaping how we interact with our environment. From thermostats and lighting to advanced security systems and entertainment setups, IoT devices have become essential components in modern living and working spaces [2]. They not only introduce automation and convenience but also amplify energy efficiency and control capabilities [3][4]. Being able to remotely monitor, control, integrate, and customize these devices has become a quintessential feature for users worldwide. However, with the vast selection of IoT devices, a challenge arises: How can users select reliable, efficient, and secure devices that truly cater to their needs?

The IBPS Platform, addresses this exact challenge. Acting as a comprehensive solution, it integrates a robust benchmarking feature that facilitates users in evaluating and comparing the performance of diverse IoT devices. By emphasizing objective metrics [5] such as energy consumption, response time, connectivity stability, and security measures, IBPS offers invaluable insights that guide users in their decision-making process. With this project, we aspire to refine and scale the IBPS platform, making it an indispensable tool for users and manufacturers alike.

## Internship Objectives

The selected candidate will be working on the following tasks:

- Analyzing the existing IBPS platform to recognize potential enhancement areas and features.
- Designing and implementing advanced benchmarking tests to encompass a wider range of device scenarios.
- Developing extra GUI components for showcasing advanced test outcomes and comparison matrices.
- Bolstering the platform’s scalability to manage a larger collection of devices and simultaneous benchmarking tasks.
- Automating various tasks, like initiating tests and result comparisons.
- Documenting the new features and user guides.
- Conducting exhaustive testing of the new features to ensure reliability and stability.

## Qualifications

Master 2 or last year of engineering school.

## Skills & qualities

- Fluent in English
- Innovative aptitude for enhancing software-based systems.
- Prior experience with performance benchmarking platforms is a plus but not required.
- Knowledge of tools and resources such as IoT device SDKs or APIs, traffic capturing tools (e.g., Wireshark), and familiarity with Python programming.

## Useful information

- Starting date: February 2024 (flexible)
- Duration:: 5-6 months
- Location: Télécom SudParis, Evry or Palaiseau

## Contact

To apply, contact:

- Georgios Bouloukakis - `georgios.bouloukakis AT telecom-sudparis.eu`
- Nikolaos Papadakis - `nikolaos.papadakis AT telecom-sudparis.eu`

by providing the following documents:

1. CV
2. Motivation letter
3. Transcripts of the last 3 years
4. A course report or article written in English (if any)

## References and Additional Reading

- [1] Statista. Number of internet of things (iot) connected devices worldwide from 2019 to 2023, with forecasts from 2022 to 2030, 2023. Accessed: 2023-10-23.
- [2] Sachin Kumar, Prayag Tiwari, and Mikhail Zymbler. Internet of things is a revolutionary approach for future technology enhancement: a review. *Journal of Big Data*, 6, 12 2019.
- [3] Paula Raymond Lutui, Brian Cusack, and George Maeakafa. Energy efficiency for iot devices in home environments. In *2018 IEEE International Conference on Environmental Engineering (EE)*, pages 1–6, 2018.
- [4] Venkatesh Reddy, Mahbub Rabbani, Mohammad T Arif, and Aman MT Oo. Iot for energy efficiency and demand management. In *2019 29th Australasian Universities Power Engineering Conference (AUPEC)*, pages 1–6, 2019.
- [5] Donatien Koulla Moulla, Ernest Mnkandla, and Alain Abran. Systematic literature review of iot metrics. *Applied Computer Science*, 19:64–81, 03 2023.