

Design and Implementation of Web Frontend for Public IoT Testbed

Student Assistant (SHK) Proposal

Shepherd [1] is an open-source testbed for batteryless IoT nodes. The testbed features several embedded Linux BeagleBone boards with a custom hardware frontend, which are orchestrated and time-synchronized via Ethernet. The custom frontend enables Shepherd to record energy-harvesting traces at high rate and resolution, and to replay these traces to an attached batteryless IoT node to emulate real energy-harvesting scenarios. An instance of the testbed is intended to become available to the public. The hardware is going to be rolled out in an office environment in the university. Control of the testbed is handled via a web server.

The task of the student assistant is to develop a web frontend that allows users of the testbed from around the world to configure and schedule their own test scenarios. Starting with layout studies, the design will be implemented as web mockup (HTML, CSS) afterwards. This mockup can be refined to cover the various sub pages like landing page, user management, job scheduler, and status panel. Design templates derived from the mockups will be dynamically filled by a Django framework running on Python and connecting to the testbed and databases.

The student will be supplied with all necessary tools and be fully supported so that the student can focus on the actual task. Depending on interests, background, and time budget, the student may also choose to work on the subsequent development process that covers generating and preparing the actual dynamic content for the website in Python. Supervision will be possible in German or English.

Requirements

- Interest in web design
- Experience with HTML and CSS
- Experience with Django is optional

Contact

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References

- [1] K. Geissdoerfer, M. Chwalisz, and M. Zimmerling. Taking a deep dive into the batteryless Internet of Things with Shepherd. *GetMobile*, 2020. <https://tinyurl.com/bk592evh>.