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Computer Science



Role as an R&D Intern at AGT Group R&D GmbH

I worked for 11 months at AGT International's R&D center in Darmstadt, Germany. I worked in the Research department, which focuses on EU-funded research projects under the supervision of Dr Martin Strohbach, Director Research. Each of these projects has a different topic and goals, and uses a wide variety of technologies.

Since the start of my internship I worked in a project called IoTCrawler.



IoTCrawler is an EU-funded project part of the Horizon2020 initiative which focuses on creating a Search Engine for the Internet of Things (Data Streams and metadata about them and sensors), often described as a "Google for the Internet of Things". My main task was working on AGT's first steps in IoTCrawler, including:

- Hands-on research
- Documentation of findings
- Development of prototypes and demonstrators for the project
- Development of interim tools for data gathering and testing
- Development of important software for AGT's IoTCrawler contribution

Smart Home Use Case and Demonstrators

At AGT International we centred our efforts on the Smart Home use case, thus I learned since early on about different communication protocols used by Smart Home devices. These include Bluetooth and BLE, UPnP, Z-Wave, ZigBee, EnOcean, etc. And also about network scanning techniques.

I acquired a lot of experience in background research, literature review and research-oriented development. By early November we had made significant progress, to the point that we were able to develop a demonstrator which we presented at ICT2018 in Vienna (shown on the right) and later summed up in this video I produced (shown above). It included scanning components, a website and an Amazon Alexa Skill for user interaction, database deployed in AWS and power consumption metrics, used for activity detection in the simulated Smart Home.



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Co-authoring a Paper

We continued to research topics such as Unit matching in order to obtain information of the measurements from the extraction of units in the data, automatic or semi-automatic extraction of endpoints and information from structured or semi-structured API documentations in different common formats. We also continued designing and enriching our Smart Home Crawler Ontology.

After ICT2018 we prepared a paper "Smart Home Crawler: Towards a framework for semi-automatic IoT sensor integration" published at the IEEE GIoTS2019 conference, which marked my first scientific coauthored publication and provided me with experience on conducting research, specifically on synthesis, and critical evaluation of results and future improvements. Our demonstrator was upgraded periodically to include the latest researched features we could implement.



IV. SMART HOME CRAWLER In this section we describe the IoTCrawler architect

fome Crawler Framework and a prototype that rated at ICT 2018. A video of our prototyp



Some technologies used

Confluence Bitbucket **ŸJIRA**









