BP-Meets-IoT Challenge 2020

The 4th edition of the BP-Meets-IoT Workshop launches a challenge aiming at exploring the interplay between the Internet of Things (IoT) and process mining. This year's challenge focuses on smart environments. It provides participants with a realistic set of logs of a smart home and challenges them to analyze these logs focusing on extracting habits and other unique insights on the personal process(es) of the home inhabitants.

We strongly encourage participants to use any tools, techniques, methods at their disposal. There is no need to restrict to open-source tools; proprietary tools as well as techniques developed or implemented specifically for this challenge are also welcome.

The habits and the datasets

The aim of a smart space is providing people with automatic or semi-automatic services, thus realizing the vision of Ambient Intelligence (AmI). The input for this intelligence is represented by a sensor log, which is a sequence of measurement values acquired from sensors deployed across the monitored space.

Many approaches have been proposed in the literature to automatically analyze sensor logs, to understand the current context, and to make decisions on the basis of user preferences and habits. All of these solutions are based on models that relate the output of the sensors during a (potentially very short, as when a gesture is recognized) temporal window, to a specific contextual information that can be then employed to act or reason on the state of the environment. The final aim is to discover habits. We define a habit as a sequence or interleaving of activities that happen in specific contextual conditions (e.g., what the user does each morning between 08:00 am and 10:00 am). A habit is similar to a personal process, but the focus is on the routine and not solely on the final goal.

For the BP-Meets-IoT Challenge 2020, we make use of a self-made simulator able to produce three different logs:
- The sensor log contains raw sensor measurements.
- The event log contains an event stream
- The activity log contains the event stream clustered into traces (which should be recognized as habits)

All the three logs are in XES format. The sensors simulated in the environment will comprise a set of different sensors, such as the following ones:
- Position sensors that can be placed anywhere in the space
- Fridge door contact
- Power use
- Bed pressure sensor
- Water use sensor

On May 5th, 2020, we will distribute a certain amount of logs (always in triples) corresponding to 3 different scenarios and we ask participants to gain insights over the user habits that are included in those scenarios. The number of inhabitants and the complexity of the scenarios will be varying. The exact set of sensors will be made public when the dataset is published.

When using the dataset, please refer to it as:
F. Leotta, M. Mecella, E. Serral-Asensio, Dataset BP-Meets-IoT Challenge 2020. DOI (available at the time of distribution)

The Challenge

The challenge is quite open. The main question to be answered is whether there is a collection of process models which together properly describe the habits of the inhabitants. Any collection of models that together explain the habits of all the inhabitants is appreciated. In addition, details on the habits and inhabitants which can be derived from the dataset, for each of the three scenarios, contribute to the completeness of the answer.

Participants and submissions

Any participant team can apply to the challenge, including Bachelor, Master and PhD students, as well as academics and professionals, also in teams (of any composition) to show their skills in analyzing habits and demonstrating how process mining can be applied in smart environments. The submitted reports are judged on their level of professionalism and originality of the results. The participants are expected to report on a broad range of aspects. The reports will be judged on their completeness of analysis and usefulness for the purpose of a real-life smart environment.

Submissions should be made through EasyChair at https://easychair.org/conferences/?conf=bpm2020 where you indicate your submission to be a BP-Meet-IoT submission. A submission should contain a pdf report of at most 25 pages, including figures, using the LNCS/LNBIP format (http://www.springer.com/computer/lncs?SGWID=0-164-6-791344-0) specified by Springer (available for both LaTeX and MS Word). The title should clearly mention the submission is for the Challenge. Appendices may be included, but should only support the main text.

All reports submitted should be presented at the workshop (having a registered participant) through a poster. The committee will review the report and select the three best ones to have a presentation of their approach and answer the audience questions in a specific session of the workshop. On the basis of the committee reviews and the opinion of the workshop audience, the winner will be selected.

The Prizes

All reports will be invited to submit a short paper to appear in the BP-Meet-IoT post-proceedings. The three best reports will be invited to submit a regular paper in the BP-Meet-IoT post-proceedings. The winner will receive a certificate and will be invited to submit a paper for a special issue on IoT analytics in the *Decision Support Systems* Journal.