

Behavioral Dataset: Characteristics and Details

Anonymous Author(s)

Affiliation

Address

email

1 Dataset Characteristics

Here we detail some of the characteristics of our dataset as a response to concerns on the realism and detail. We will clarify these details in Section 5 in our revised paper.

- How well routines are captured?:** Simulating routine behavior is a challenge because we are not aware of any datasets that capture longitudinal patterns in individual person behavior while also monitoring household objects (CASAS and other activity recognition datasets have activity data, but no object data). This is why we conducted a two-stage crowdsourcing data collection process in which we 1) collected times schedules for routine activities from a diverse set of individuals, and 2) had multiple coders generate diverse behavior scripts for each activity.
- Can we model finer time scales?:** Our predictive model has a parameter that controls at which time increments the next prediction occurs. We set this parameter to 10 minutes in this paper, though the variable can be easily changed. Importantly, the simulated data is not constrained by the 10 minute time discretization. The dataset consists of scripts with timestamped actions, such as ‘grabbing towel at 8:17am’. Simulating such scripts results in scene graphs before and after every action, and hence a graph sequence can be built at arbitrary time discretizations. The limit is only the duration of the actions of finding, grabbing, placing objects and so on. We could have the robot predict the world at 1-minute increments or even shorter if desired. We will clarify this in the paper.
- Does our model capture variability in human routines?:** Yes, we induce variability by sampling from a noisy schedule distribution. The final dataset contains artifacts similar to real-life routines, such as missing certain activities on some days and varied times and durations of different activities. The time and duration ranges were obtained from crowdsourcing. We will clarify these details in the paper.

2 Dataset Generation Clarification

Here we answer some of the reviewer’s clarification questions regarding the generation process of the dataset. We will improve the description in the paper, though some of the details will be omitted due to space limitations. We have prepared a more detailed description that will be released as part of an appendix, as well as part of the read-me that comes with the dataset.

- How do we cluster personas?:** We obtain data points regarding temporal activity schedules from several (21) people, each of which represent a sample of what time on a typical day they do each activity. For example, samples for breakfast can be ‘6am-7am’, ‘10am-11am’, etc. Each of these represent a single data point, so to generate a distribution, we aggregate these samples. Since these samples represent distinct habits, we first cluster them to find samples that represent a common habit, such as ‘6am-7am’ represents early breakfast, and ‘10am-11am’ represents late breakfast. Then we average the samples belonging

37 to each cluster to form temporal distributions of when that activity would be done by a per-
38 son who exhibits that habit. We generate temporal schedule distributions for five distinct
39 fictitious personas by assigning habits for each activity.

40 2. **How do we combine activity schedules and action sequences?:** In addition to the above
41 temporal data, we source action sequences for every activity independently, as the reviewer
42 pointed out. To generate a complete routine, we combine both temporal and action-level
43 information. We sample an activity, given time, from the temporal schedule distribution of
44 that persona. Then for the obtained activity we sample the action sequences from a script
45 representing how the persona executes that activity. When the person finishes an activity,
46 we repeat the process by sampling the next activity from the schedule distribution. There-
47 fore, the sampling process effectively combines both sources of information to generate
48 sample routines unique to that fictitious persona.