

Caregiver Presence and Activity Detection

Why it Matters: When home care services are contracted, it is important for payors and providers to have confidence that caregiving services are delivered with fidelity. It can be challenging, though, to verify caregiver-reported hours and activities. The Sovrinti system provides a path to greater accountability through location and activity detection.

Background: The Sovrinti system utilizes high temporal, spatial, and device use change recognition to autonomously identify and quantify activities of specific individuals in a private residence or senior living facility. The examples shown are from an ongoing (2022-2023) pilot program with a large home care provider where the Sovrinti system is installed in the homes of older adult clients. Goals of the pilot include understanding the value added by the system and how best to integrate it into the home care provider's workflow. The examples below represent around 5 months of data from a professional caregiver contracted to provide 20 hours per week of caregiving to a 59-year-old female client who resides alone in a one-bedroom, one-bathroom apartment.

Example Data: Figure 1 shows caregiver location data by time of day from 11/12/22 – 4/22/23, with each ring of data representing one day on the face of a 24-hour clock. Inner rings reflect earlier dates progressing to the outermost ring, 4/22/23. The caregiver was asked to carry a location-detection device (PTag) when they were at the client's residence. They reportedly attached the PTag to their home care ID badge.

The caregiver's PTag was detected in the client's home 3.95 hours each week, on average. Between 11/13/22 and 4/22/23, the caregiver's presence was confirmed for a total of 89 hours, 37 minutes, with the most time being spent in the client's bedroom – 34 hours, 33 minutes. The detailed data is consistent with continuous carry of the Sovrinti badge tag and device attribution not associated with the Care Recipient. The disparity between the average number of hours the caregiver was detected weekly (3.95) and the hours they are contracted for (20) warrants further investigation by the home care provider. Questions that might be asked include: How many hours per week did the caregiver report they grocery shopped and ran other errands for the client? To what extent does this account for the disparity?

Figure 2 offers a snapshot of caregiver location data from 4/14/23. It reports that the caregiver was first detected in the client's residence at 12:45pm and last detected at 2:13pm. Location data suggests the caregiver went in multiple rooms and spent at least 23 minutes in the same room as the client (CR) based on the location of the client's PTag in relation to the caregiver's tag. "Trips out of the house" designates times when the caregiver's PTag was not heard in the client's apartment, which accounts for 49 minutes of the visit. In a home care context, a supervisor reviewing this report might explore the reason for the gaps in the caregiver PTag being detected.

While Figure 3 shows the isolated caregiver location data for the kitchen, Figure 4 depicts all kitchen events (e.g., sink on/off, fridge door open/close, utensil drawer open/close, stove on/off, etc.). As seen by the density of data points (red circle), there is increased kitchen activity at the times the caregiver is in the kitchen, which suggests their involvement in unloading groceries,

meal preparation, and cleanup. Similarly, the blue data points in Figure 5 reflect a weekly shower usually between 9:15am and 10am. Figure 6 shows corresponding location data for the caregiver (green) that places them in the bathroom at the time of the client's weekly showers (orange circle). This corroborates the home care agency's report that the caregiver assists the client with bathing. Blue arrows indicate the few times the caregiver's PTag was not detected in the bathroom at the time of the client's shower. This anomaly detection could prove valuable for payors and providers wanting to ensure there are no gaps in care.

Summary: In the examples discussed, activity patterns are identified for a caregiver contracted to provide 20 hours of caregiving per week. Through location and activity detection, the Sovrinti system offers unparalleled insight into caregiving service provision. Equipped with this actionable insight, payors and providers can ensure clients are receiving the caregiving services necessary to support their independence.

For Further Analysis: Additional data is available to examine which activities (e.g., meal preparation) can be attributed to the caregiver, the distance the caregiver traveled in feet while at the client's residence, patterns in caregiver activity, and anomaly detection (e.g., days the caregiver was present at the client's apartment for less than a certain amount of time, instances where it appeared that the caregiver did not assist with the client's shower).

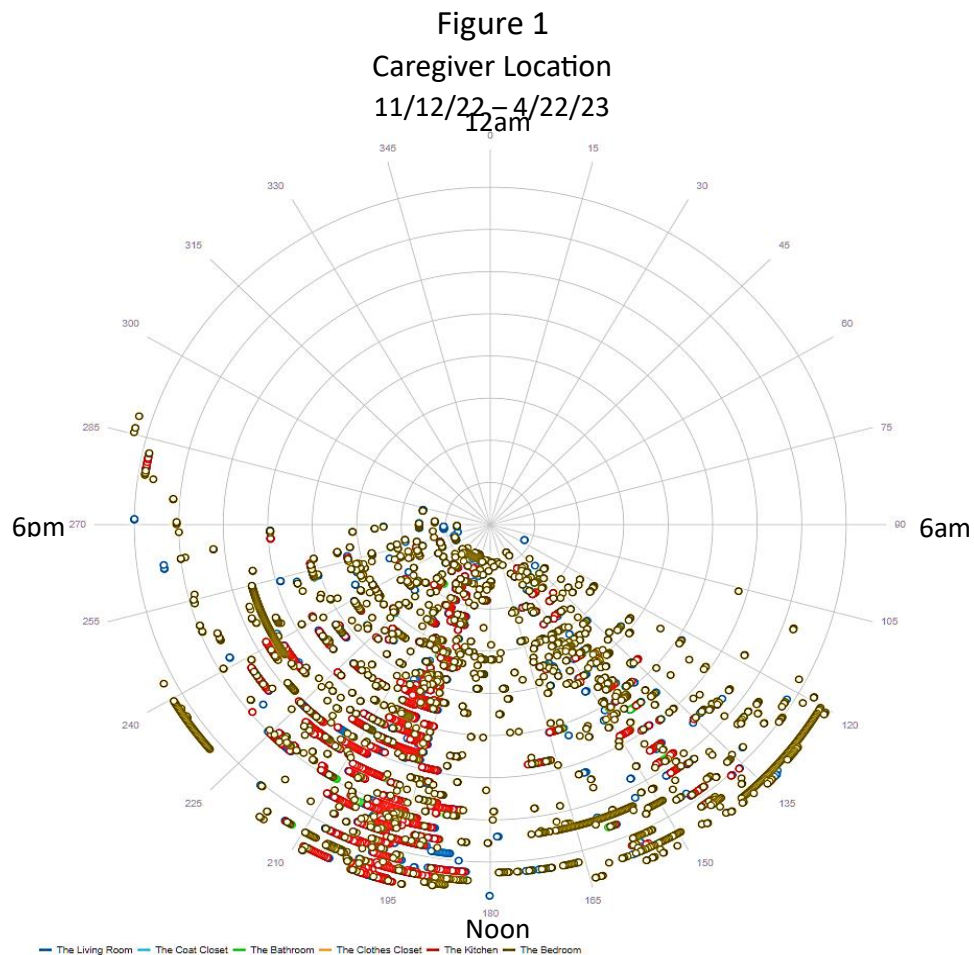


Figure 2 Caregiver Ptag Report

Ptag Report

Generate report about selected ptag from until Include all interactions with

Visit on Friday, 4/14/2023

Arrived at: **12:45 PM**

Left at: **2:13 PM**

Visit lasted: **1 hours 28 minutes**

Time Spent in each room:

About 12 minutes spent in The Living Room.

About 14 minutes spent in The Kitchen.

About 27 minutes spent in The Bedroom.

About 6 minutes spent in The Bathroom.

Time Spent in a room with another tag:

About 6 minutes spent in The Living Room with CR

About 10 minutes spent in The Kitchen with CR

About 7 minutes spent in The Bedroom with CR

List of trips out of the house:

Tag was not detected from 12:50 PM to 12:55 PM. A total of 5 minutes.

Tag was not detected from 12:56 PM to 1:02 PM. A total of 6 minutes.

Tag was not detected from 1:10 PM to 1:29 PM. A total of 19 minutes.

Tag was not detected from 1:42 PM to 1:50 PM. A total of 8 minutes.

Tag was not detected from 1:57 PM to 2:08 PM. A total of 11 minutes.

List of system down times that may affect results:

Receiver 53061 was up the entire day.

Receiver 53098 was up the entire day.

Figure 3
Caregiver Location: Kitchen
11/12/22 – 4/22/23

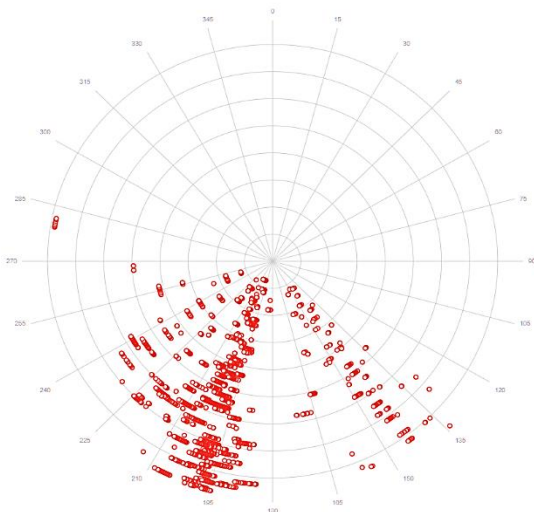


Figure 4
Kitchen Events
11/12/22 – 4/22/23

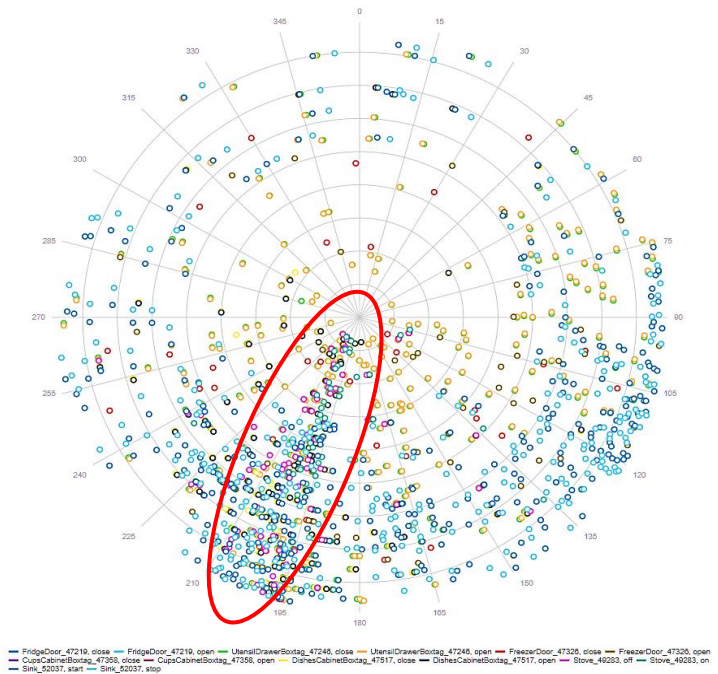


Figure 5
Shower Events
11/12/22 – 4/22/23

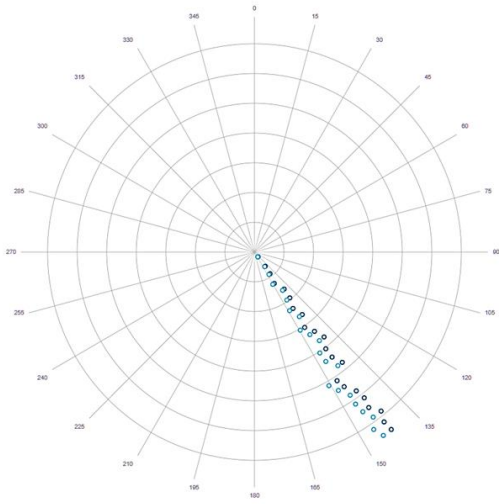


Figure 6
Caregiver Location: Bathroom
11/12/22 – 4/22/23

