Abstract— We discuss the design and development of a social isolation detection platform for older adults, SMartphone-based Isolation anaLysis for older adults (SMILE), using various types of information gathered from smartphones including contacts, phone logs, and social media activity. Our approach uses an analysis of activity/cellphone data to detect changes in patterns of interaction over time. The idea is to trigger interventions (nudge caregivers/family to engage or call) when it is inferred that there are changes in regular patterns/interactions etc. The platform contains data collection, storage, analytics, and alerting components distributed across mobile devices, and remote servers, using cloud databases as a conduit. Analysis techniques were developed to fuse information from these multiple data sources and calculate a metric that we designed to quantify the level of interaction experienced by specific individuals over time. Techniques used to improve accuracy and reduce false positives include change detection methods to focus more on significant variations in behavioral patterns, and personalized weights to capture people's preferences for means of interaction. We implemented and evaluated SMILE using a real-world dataset containing call and text logs of multiple individuals.

Keywords— social isolation, smartphones, data analytics, interaction frequency, older adults