

PH.D. PRELIMINARY ORAL EXAMINATION

**Thursday, October 27th
12:40p.m. @ 223 Atanasoff**

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Major Professor: Carl Chang

Recognition of Activities of Daily Living

Activities of daily living (ADL) are things we normally do in daily living, including any daily activity such as feeding ourselves, bathing, dressing, grooming, work, homemaking, and leisure. The ability or inability to perform ADLs can be used as a very practical measure of human capability in many types of disorder. Oftentimes in a health care facility, with the help of observations by nurses and self-reporting by residents, professional staff collect ADL data and enter data into the system manually.

Technologies in smart homes can provide some solutions to detecting and monitoring a resident's ADL. Typically multiple sensors can be deployed, such as surveillance cameras in the smart home environment, and contacted sensors affixed to the resident's body. Note that the traditional technologies incur costly and laborious sensor deployment, and cause uncomfortable feeling of contacted sensors with increased inconvenience. In this research, we make extensive use of smart phones as they are gradually becoming widely used. Our work is to detect and recognize ADL by capturing, processing and analyzing data from multiple sensors embedded in smart phones. Our research goals are to detect ADL with time stamps, and record detected ADL into the system without human intervention.

Key technologies in this research cover audio processing, Wi-Fi indoor positioning, proximity sensing localization, time-series sensor data fusion. I will present preliminary studies in exploring these technologies based on experiments conducted in real-life situations while data are all collected from single-point smart phones.

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