C.F. CRISPIM-JUNIOR, A. KONIG, R. DAVID, P. ROBERT, F. BREMOND. ***Automatic prediction of autonomy in activities of daily living of older adults.*** *Gerontechnology 2016;15(suppl): 74s*; doi:10.4017/gt.2016.15.s.875.00 **Purpose** The world population is aging and the number of seniors in need of care is expected to surpass the number of young people capable of providing it. It is then quintessential to develop instruments to support doctors at the task of diagnosing and monitoring the health status of seniors[1-3]. Methods to assess autonomy and functional abilities of seniors currently rely on rating scales[4]. The subjective character of these scales and their dependence on human observations tend to jeopardize the timely diagnosis of deteriorations in cognitive health. We propose a probabilistic model (PM) to objectively classify a person's performance in executive functions into three classes of cognitive status: Alzheimer's disease (AD), mild cognitive impairment (MCI) and healthy control (HC); and into different levels of autonomy: good, intermediate or poor. **Material & Methods** The proposed PM relies on Naïve Bayes model for classification and takes as input automatically extracted parameters about a person's performance at activities of daily living (event monitoring system, EMS, *Figure 1*). To evaluate our approach participants aged 65 or older were recruited within the Dem@care project protocol, at the Memory Center of the Nice university hospital: n=49; 12 AD (5 male), 23 MCI (13 male) and 14 HC (5 male). They were asked to carry out a set of instrumental activities of daily living (IADL, e.g., medication preparation; talking on the telephone) in an observation room equipped with everyday objects. **Results & Discussion** EMS recognized targeted IADLs with a high precision (e.g., 'prepare medication': 93%, 'talk on the telephone': 89%). The proposed PM achieved average classification accuracy of 73.5 % for cognitive status classes and of 83.7% for autonomy classes. Moreover, the proposed PM displayed a higher accuracy when inputted with EMS data than with human annotations of daily activities. This finding is explained by the stability of EMS recognition which permits to relate subtle deviations from activity norms to characteristic traits of target classes. **Conclusion** The proposed framework provides clinicians with diagnostic relevant information to support autonomy assessment in ecological scenarios by decreasing observer biases and facilitating a more timely diagnosis of frailty patterns in senior. Further work will extend the proposed framework to other clinical sites and seek for novel cues about autonomy decline in seniors.

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Keywords: IADLs, automatic activity recognition, frailty analysis, computer vision
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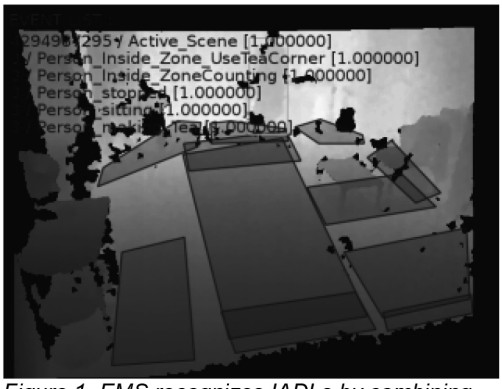

Figure 1. EMS recognizes IADLs by combining automatically detected and tracked people using RGBD sensors and semantic information (overlaid polygons); top-left textual descriptions denote recognized events