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# Assessment of Autonomy in Instrumental Activities of Daily Living in Pre-and Demented Patients Using an Automatic Video Monitoring System

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Objectives: To investigate the use of a video monitoring system for automatic event recognition for the assessment of autonomy in Instrumental Activities of Daily Living (IADL) in dementia patients.

Methods: Three groups of participants (healthy control, Mild Cognitive Impairment and Alzheimer's disease) had to carry out a standardized scenario consisting of directed tasks (single and dual task) and IADLs such as preparing pillbox. During this time they were recorded by 3D video cameras capturing all their activities. The performance quality of each participant was manually annotated and assessed based on the amount of successfully carried out activities. Recorded data was processed by a platform of video signal analysis in order to extract kinematic parameters detecting activities undertaken by the participant. We developed a classifier based on the extracted video features for diagnostic prediction and further autonomy performance prediction.

Results: Overall activities were correctly automatically detected. The most accurate detected activities were: using the phone with 91% accuracy and preparing pillbox with 88% accuracy. The diagnostic group classifier based on the automatically extracted video features obtained accuracy of 71.79 % when combining directed tasks and IADLs. Autonomy group classifier obtained an accuracy of 84.61% when combining directed tasks and IADLs.

Conclusions: The results suggest that it is possible to assess autonomy with the help automatic video monitoring system (AVMS) and that the use of such technologies could provide clinicians with diagnostic relevant information and improve autonomy assessment in real time decreasing observer biases.

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