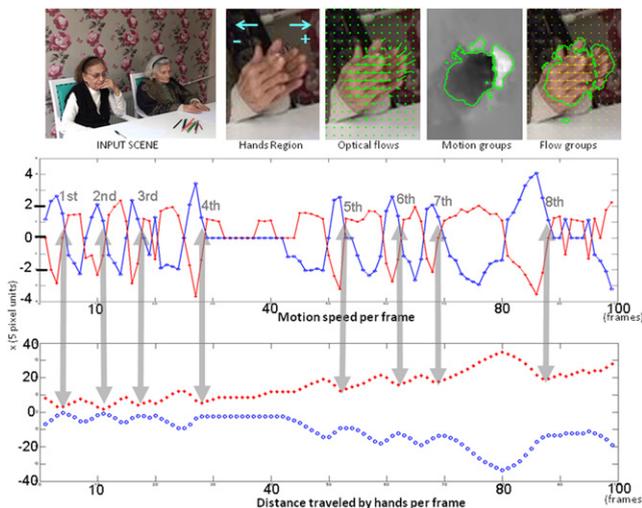


**P2-439** AUTOMATIC ANALYSIS OF HANDS CLAPPING IN SEVERE ALZHEIMER PATIENT VIA COMPUTER VISION TECHNIQUES

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**Background:** In this work, we present a hands clapping rhythm analysis module of a video analytics framework, which monitors elderly patients and automatically collect statistical data about patient activities. Hands clapping activity is analyzed in terms of frequency of clapping, extent of clapping, and direction change. A severe level Alzheimer patient was chosen from an elderly house. **Methods:** The main idea makes use of optical flow vectors which represent the motion change of image features in consecutive frames. The algorithm steps are composed of detecting optical flow vectors in skin regions, clustering based on the direction, calculating the average flow vector in each cluster and observing these vectors over time. The magnitude of the average flow represents the speed of motion. **Results:** In the supplementary figure, handsclapping.png, the experimental results are presented. Hands motion of the patient on the right has been observed for 100 frames (4 secs). Input hands region, detected optical flows are demonstrated, followed by the two resultant motion flow groups depicted by black and white regions. The patient is active during 100 frames and claps hands eight times, two of which are long extent clapping, when the patient is very happy. In the graphs, blue lines represent the motion of right hand, while red lines represent left hand. The occurrence of clapping hands is detected by finding the instant, when right hand moves in (+) direction and changes direction to (-); and left hand moves in (-) direction and changes to (+); and the speed of each hand is greater than 2 units. It happens at frames: 4, 11, 17, 28, 53, 63, 68, 87. The graph in the bottom shows the distance traveled by each hand per frame. The symmetry in motion waves of right and left hand depicts the clapping motion characteristics and validates effectiveness of the proposed method. **Conclusions:** In this work, a hands clapping analysis module is introduced and used to monitor hand movements of a severe Alzheimer patient. The results of the experiments demonstrate the successful analysis of hands clapping motion. This initial work shows the potential of computer vision systems to automatically analyze patient behaviors and obtain statistical data.



**P2-440** VALIDATION OF THE AMSTERDAM IADL QUESTIONNAIRE®, A NEW TOOL TO MEASURE INSTRUMENTAL ACTIVITIES OF DAILY LIVING

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**Background:** Interference in everyday functioning by cognitive disturbances is one of the key diagnostic criteria of dementia. This interference is difficult to ascertain clinically, and thus reliable scales measuring instrumental activities in daily living (IADL) are needed. The psychometric quality of existing questionnaires is questionable. We therefore developed a new informant-based tool aimed at detecting incipient dementia. The Amsterdam IADL questionnaire® consists of a single factor and has a good test-retest reliability. The aim of the current study is to further investigate the quality (construct validity and interpretability) of this new IADL questionnaire. **Methods:** Informants of patients who visited the Alzheimer Center of the VU University Medical Center completed the questionnaire. Construct validity was tested by correlating scores with age, education and measures of global cognition (MMSE), daily functioning (DAD, CDR) and depression (GDS) using Kendall's tau correlation coefficients. To investigate the interpretability, we compared overall scores and items scores between patients with and without dementia using an independent t-test and Chi-square tests. Differences between early-onset and late-onset dementia patients were investigated using an independent t-test. **Results:** A total of 206 informants of patients completed the questionnaire. Scores correlated highly with DAD ( $\tau = -.462$ ) and CDR ( $\tau = .434$ ) scores. An intermediate correlation was found with the MMSE ( $\tau = -.322$ ). Low correlations were found with patients age ( $\tau = .019$ ), education ( $\tau = -.079$ ) and depression ( $\tau = .139$ ). Patients diagnosed with dementia ( $n = 91$ ) had higher Amsterdam IADL scores than patients without dementia ( $n = 90$ ), Cohen's effect size,  $d = 1.10$ ,  $\tau(179) = 7.403$ ,  $p < .001$ . A majority of the questionnaire items (58 of 70, 82.9%) could distinguish between demented and non-demented patients. We found no differences between early- and late-onset dementia patients. **Conclusions:** In this first validation study of the Amsterdam IADL questionnaire® we found good construct validity and ability to distinguish between demented and non-demented patients. In addition, the questionnaire is suitable for both early- and late-onset dementia patients. We therefore think the Amsterdam IADL questionnaire is a promising and valuable new tool in the evaluation of dementia. <sup>1</sup> Amsterdam IADL questionnaire is a registered trademark of Alzheimer Center VU University Medical Center.

**P2-441** ASSESSING DEPRESSIVE SYMPTOMS IN COMMUNICATION-IMPAIRED OLDER PERSONS IN LONG-TERM CARE FACILITIES: THE FEELING TONE QUESTIONNAIRE (FTQ) AND ITS PSYCHOMETRIC PROPERTIES

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**Background:** This research aimed at developing a means of uncovering the subjective inner life of persons who are seriously limited in their ability to communicate feelings of distress associated with depression and other affective disorders. These analyses further developed a reliable and valid measure of affective disorder in communication impaired elderly persons with dementia. The FTQ builds upon the existing knowledge in the field of assessment of depression in dementia by combining a direct assessment focus and clinical observation method and adding behaviorally anchored ratings of affect, or feeling tone. **Methods:** The Feeling Tone Questionnaire consists of 16 questions and 16 corresponding observation ratings of affect and was specifically designed for use with the communication-impaired demented patient. The total sample size was 764 respondents from four samples of respondents in New York City and upstate New York nursing homes and a psychiatric hospital. The mean age of the combined sample was 84. The FTQ was administered in all settings by trained interviewers. **Results:** Internal consistency reliability and interrater reliability were good across all four samples, as was test-retest reliability. concurrent convergent construct validity and discriminant validity coefficients were generally high. Criterion-related validity was provided in two samples utilizing DSM ratings by geriatric psychiatrists. **Conclusions:** These findings provide support for the view that the FTQ works well as a method of facilitating the recognition of depressive signs in the more severely communication-impaired group of demented older persons.