ARIA
APPLIED RESEARCH IN ACTION

Vision-Based Analysis of Gait in Older Adults with Dementia

Unlocking new insights into gait patterns in dementia with computer vision, paving the way for personalized fall prevention and tailored interventions.

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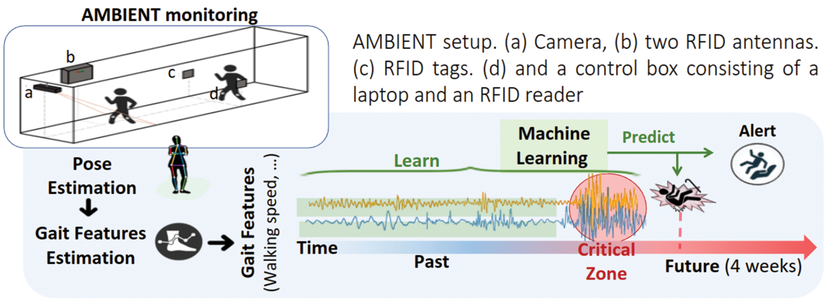

AMBIENT setup. (a) Camera, (b) two RFID antennas. (c) RFID tags. (d) and a control box consisting of a laptop and an RFID reader

PROJECT SUMMARY

This research aims to advance gait assessment in older adults with dementia using cutting-edge computer vision and machine learning techniques. Gait analysis plays a crucial role in understanding the biomechanical abnormalities associated with aging, including the risk of falls and fall-related injuries. Traditional clinical assessments are subjective and lack sensitivity to subtle changes, making automated and non-invasive gait assessments essential.

This project addresses two critical aspects: fall prediction and Parkinsonism severity estimation. Falling poses significant risks for older adults with dementia, and early detection can prevent injuries and enhance their quality of life. Additionally, assessing Parkinsonism severity through gait characteristics offers insights for personalized treatment.

While previous research has explored video-based monitoring and pose tracking, this project introduces custom gait representations tailored to the clinical needs of older adults with dementia. We aim to overcome limitations observed in off-the-shelf pose tracking models and expand the range of gait features considered for assessment.

Machine learning techniques will be leveraged to analyze complex gait data and provide actionable insights for caregivers and clinicians. The ultimate goal is to create a non-invasive, single-camera approach that captures gait dynamics in real-world settings, enabling timely interventions and personalized care. This research holds immense promise for enhancing the lives of older adults with dementia by offering precise gait analysis and fall prediction, ultimately reducing the burden of injuries and improving their overall well-being.

REFERENCES

Vida Adeli, Navid Korhani, Andrea Sabo, Sina Mehdizadeh, Avril Mansfield, Alastair Flint, Andrea Iaboni, and Babak Taati. Ambient monitoring of gait and machine learning models for dynamic and short-term falls risk assessment in people with dementia. IEEE journal of biomedical and health informatics, 2023

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