



Robot + AI-based Facial Expression Analysis to Detect Agitation in Persons with AD/ADRD

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JH AITC[AD/ADRD or Aging] Focus Pilot Core



A Module in a Comprehensive Robot+AI Based Platform for Senior Care

Physical and verbal agitation is found in 80% of nursing home residents

- **Agitation** can pose a major problem for the resident, their family and for caregivers.
- Patterns of agitation are **specific to each person** living with AD/ADRD.
- The inability to successfully manage dementia behaviors often results in **increased burden on caregivers** and **use of antipsychotic & psychotropics medications**.
- Use of antipsychotic and psychotropics medications **increases the risk of death and the risk of falls and fractures**.

Non-pharmacological Treatment of Agitation

- ❑ **Sensory and reminiscence therapies** may work to reduce ADRD-related agitation by decreasing feelings of isolation and boredom, or by distracting from repetitive thoughts.
- ❑ The **Agitation and Behavior Mapping Instrument (ABMI)** is a validated and effective tool to detect agitation and a window for targeting nonpharmacological interventions.
- ❑ Administering nonpharmacological intervention **when needed is time consuming**.

How A Robot with AI Can Help Solve the Agitation Problem?

- ✓ The robot **autonomously navigates** to the resident's room and we program it to face and observe the resident.
- ✓ We integrate an AI-based facial expression analysis software on the robot.
- ✓ We **train the robot and validate its ability to detect agitation** in persons with AD/ADRD.
- ✓ We use the robot with the new agitation detection capability to detect **peak Agitation times applying (ABMI)**.
- ✓ Using the peak agitation times map, a **personalized nonpharmacological intervention** can be administered by the robot to calm down residents, reduce agitation and the need for antipsychotic and psychotropics medications.

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Acknowledgements:
National Institute on Aging
Grant P30AG073104