An Affective Robot Companion for Assisting the Elderly in a Cognitive Game Scenario

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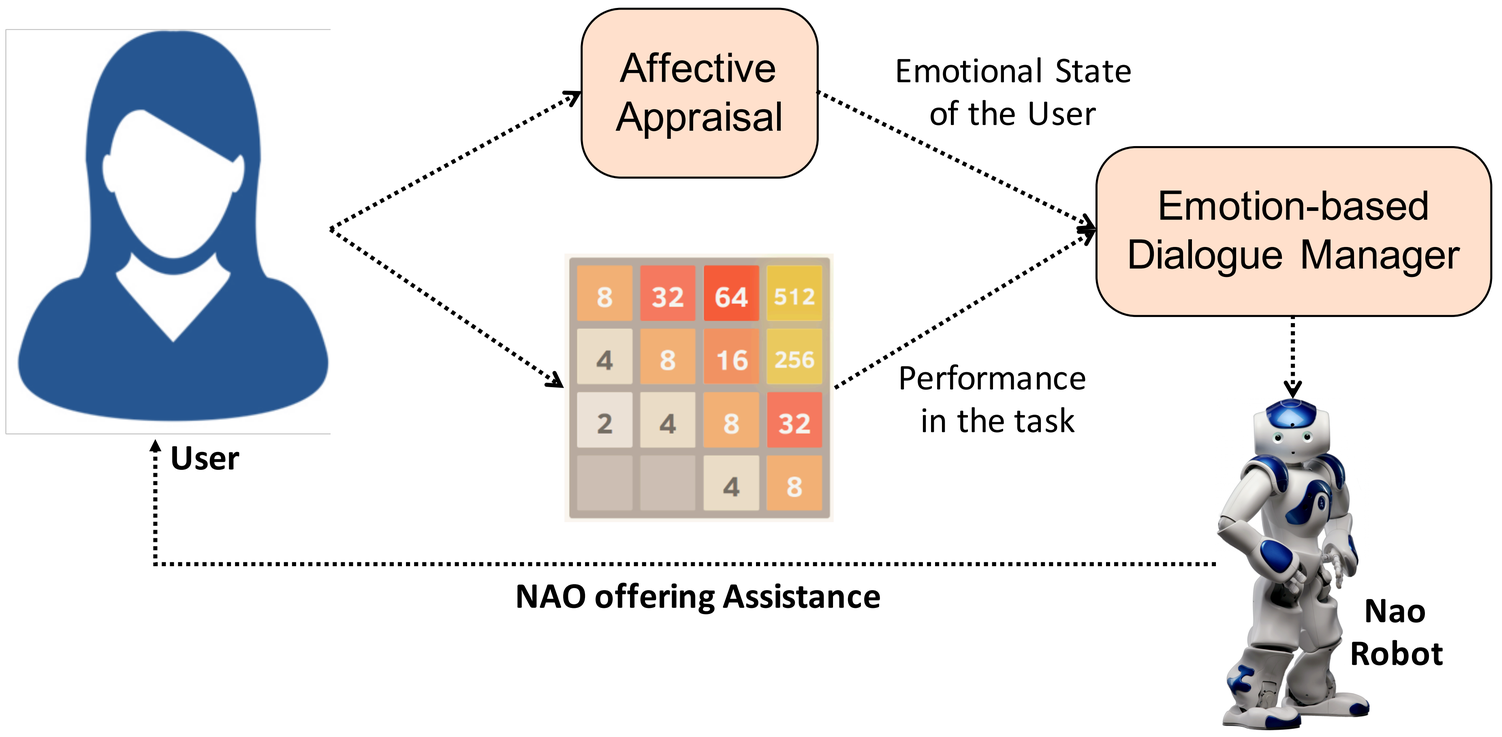
Motivation

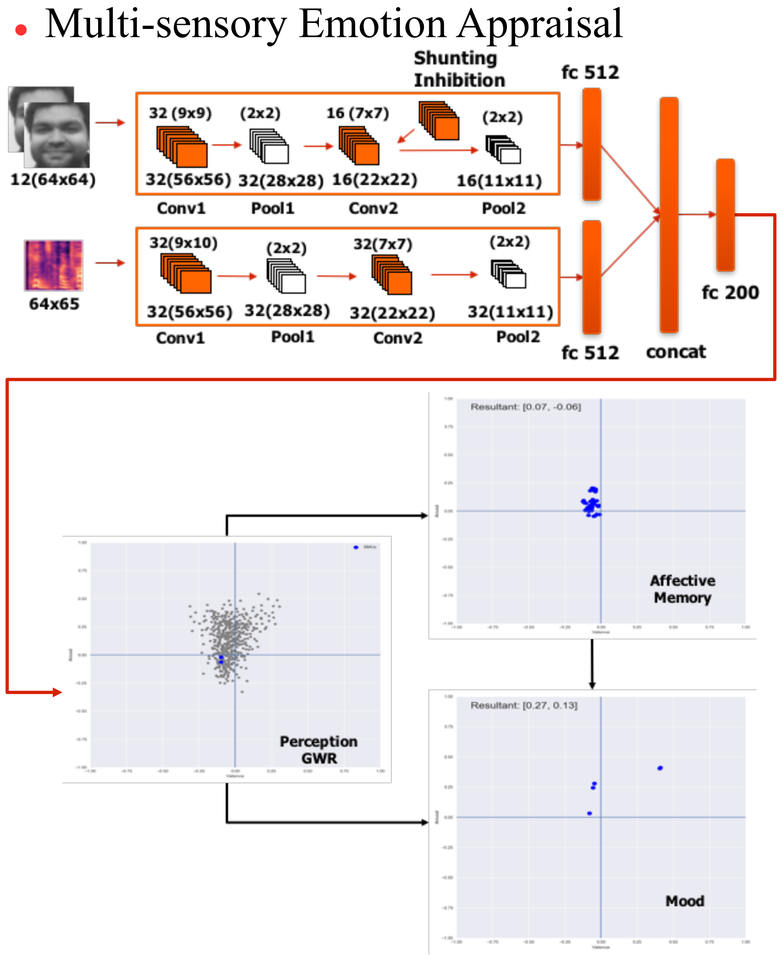
- The risk of cognitive-decline in an individual increases with age due to decreased mental and physical activity.
- Engaging in cognitively stimulating activities such as solving puzzles may reduce the risk of cognitive deterioration. Furthermore, coping with the decreased social activity with the inclusion of robot companions may lead to positive long-term benefits.
- In this position paper, a pedagogical approach is proposed towards teaching the user to solve the 2048 Puzzle Game.
- A companion robot shall actively monitor the emotional state of the user and use it, along with the performance of the user in the task, to adapt its strategy towards modelling an interaction with the user.

Interaction Scenario

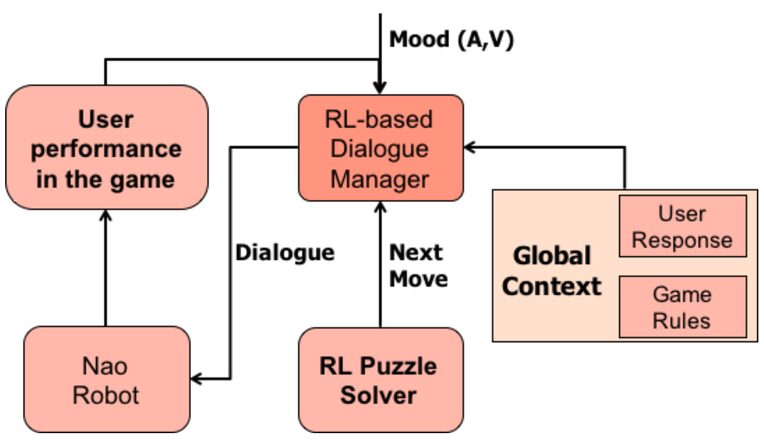


Approach

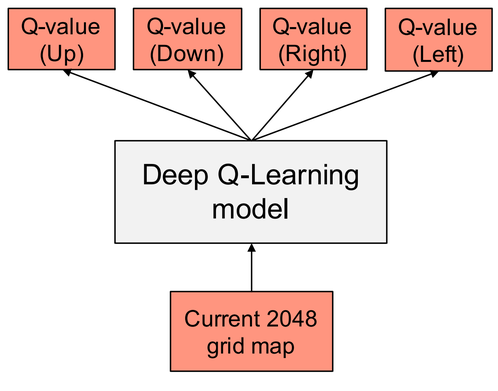
- Multi-sensory Emotion Appraisal



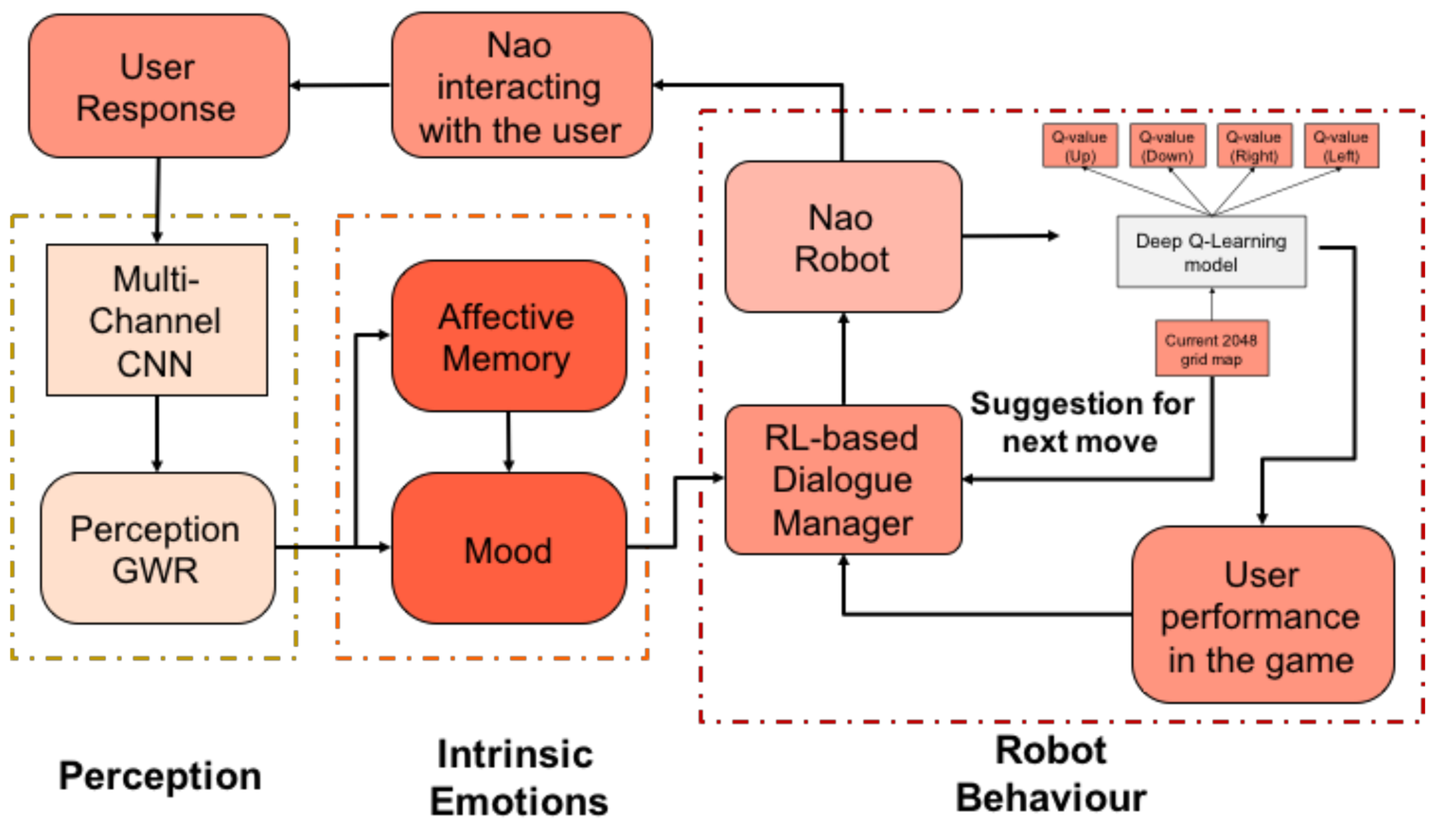
- RL-Based Dialogue Management



- 2048 Puzzle Game Solver



Proposed Model



Conclusion

- An emotion-based dialogue management model is envisaged that uses reinforcement learning techniques to learn optimal dialogue states based on the emotional state of the user.
- The model uses a multi-model emotion appraisal system to infer the emotional state of the user, based on visual, auditory and linguistic information. This affective understanding is then used to assist the users towards solving the 2048 Puzzle Game.
- The model learns when to give advice to the users, enriching their experience playing the game and at the same time assist in improving their cognitive abilities.

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