Emotion through Intel RealSense

CS2951K Final Project Proposal

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1 Research question

How facial expression convey implicit message and influence the explicit message received?

2 Significance

- Adjust the machine strategy/action accordingly.

  For example, strong negative emotion would trigger error detection/correction mechanism; faster convergence in computation to give back prompt feedback; alternative strategy in search space or algorithm for the solution.

- Alarm and report emergency for drivers, employees and patients.

- Improve user experience. The robots are more than our workers; they can be truly thoughtful and understanding companions.

3 Methodology

3.1 How to solve the problem?

1. Obtain facial expression data from Intel RealSense.
2. Construct POMDP model for emotion, action and transition.

3. Solve the decision problem using Bayes filter.

4. Test the model by user input from class and friends.

5. Adjust and formalize the model.

3.2 How to know if we have solved the problem?

Milestone 1. Successful detection of user facial expression using Intel RealSense camera and based on that, inference of emotion.

Milestone 2. Formalized POMDP model that outputs decision from input user expression and inferred emotion.

Milestone 3. Extensive testing (hoping) to justify the performance of Intel RealSense emtion inference, our POMDP model and the output decision.

Final results. We have solved the problem if testing indicates that we can make satisfiable decision given user input facial expression and commands.

4 Related Work

5 Schedule

Date	TODO
2/26 - 3/5	
3/6 - 3/12	Milestone 1
3/13 - 3/19	
3/20 - 3/26	Milestone 2
3/27 - 4/2	
4/2 - 4/7	Checkpoint presentation
4/8 - 4/14	Milestone 3
4/15 - 4/21	Prepare results
4/23 - 4/28	Final presentation

6 Bibliography