Artificial Intelligence

- Project 2 -
MMG (Multimodal Memory Game):
Understanding and Predicting
Human Recall Memory
for Cognitive Machine Learning

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Brief explanation

• Do MMG game and analyze the results.
• Discuss the factors contributing the results and possible way to improve the results etc (but not limited to these).
• Present your own idea in required form (in well-structured organization)
• If you have any questions, just email to TA.
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Overview

• Goal
  – Understand human recall memory for cognitive ML
    • Improve AI by integrating human intelligence mechanism
  – Practice research and technical writing

• Multimodal Memory Game (MMG)
  – Human recall memory game for cross-modal matching
    • Text-to-text (T2T) game
    • Text&image-to-text (TI2T) game
    • Text_text-to-text (TT2T) game
    • Text&image_text&image-to-image (TITI2T) game

• Data Set
  – Total 293 pairs of image and text from an episode of TV drama ‘Friends’
    • About a quarter of the data for each game

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To reach ‘Human-Level Intelligence’, we need to imitate/reproduce various human attributes.
Why Cognitive Science for AI?

**Cognitive Science**

**Mechanization of human intelligence**

**Artificial Intelligence**

**Principles**

**Cognitive Machine Learning**

**MMG Architecture**

**Architecture**

**Integration of human cognitive abilities**

**Lacks**

**Learning from the environment**

- Ability of systems to do what people can and computers cannot
Recognition vs. Recall Memory

Recognition

“six”

Recall

“six”
Description on Data Set

• Total 293 pairs of image & text from an episode of TV drama ‘Friends’
  – Eg.

  You could be one of those guys. You could do that. You think? Absolutely.
  – One image can be paired with more than one text
    • Several people can say in one screenshot

• About a quarter of the data for each game
  – About consecutive 75 pairs for one game

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MMG

- **MMG service will be available at the BI web site in the next week.** *(Relevant information will be announced at the course web-page)*
- **After you view the drama, you’ll be asked to enjoy MMG**
  - At least 10 sessions for a game (an experiment)
    - 20 questions for a session
  - Eg. T2T game
    - Given a sentence
    - You’ll answer the next sentence
  - Eg. TITI2T game
    - Given two consecutive TITI pairs

You could be one of those guys. You could do that. You think?

You could be one of those guys. Absolutely.
Motivation of MMG

- In the point-of-view of Cognitive Science: *Imitating recall (memory) of human brain*

- When discussing memory, recall is the act of retrieving from *long term memory* a specific incident, fact or other item.

- Three types of recall
  - Free recall: when no clues are given to assist retrieval
  - Serial recall: when items are recalled in a particular order
  - **Cued recall**: when some clues are given to assist retrieval
Task Description

• After enjoying MMG, analyze cognitive ability of human
  – In the point of view of achieving human level AI, discuss the followings:
    • What’s the factors for getting the score?
      – When you get a bad/improved/good score
    • What helped you to get an improved score?
      – Repeated practice?/augmented Modality?/others?
  • Optional – your suggestions
    – How can you help computer
      » When computer cannot do well by itself?
    – How can computer help people
      » When you want to improve your score quickly?
Reports Style

- **English only**, Scientific journal-style
  
  - How to Write a Paper in Scientific Journal Style and Format
    
    http://abacus.bates.edu/~qanderso/biology/resources/writing/HTWsections.html

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Report Contents – Mandatory

• Experiments
  – 4 types of games

• Analysis & discussion
  – Learning curve for the experiments
    • Accuracy is given automatically by the platform after you finish an experiment
  – Analysis & discussion of the learning curve
    • In the point of view of the task
Report Contents – Optional

• Analysis on the effect of other factors
• Idea/suggestion about the way of improving for multimodal memory experiments
• Idea/suggestion about the application of MMG
Submission Guide

• Due date: Nov 22, 23:59 (To be confirmed)

• Submit both ‘hardcopy’ and ‘email’
  – Hardcopy submission to the office (302-314-1)
  – E-mail submission to hsseok@bi.snu.ac.kr
    • Subject: [AI Project2 Report] Student number, Name
  – Length: report should be summarized within 12 pages.
  – If you build a program by yourself, submit the source code with comments

• Objective: NOT the accuracy and your programming skill, but your creativity and research ability.

• Individual project! You have to do it by yourself.

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Marking Scheme

• Points for experiment & analysis
  – Extra points per another aspect of experiment & analysis
  – Extra points for each optional content
• Points for the report style
• Points for overall organization
• Late work
  ▪ - 10 points per one day
  ▪ Maximum 7 days
Brief Guide to the MMG Tool

• You can enjoy web-based MMG platform from next week
  – Details will be announced at the course homepage (with manual)

• How to use
  – Registration
  – Download & view the drama
  – Enjoy 4 types of games (conduct experiments)
  – See & analysis the score (accuracy)