

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.

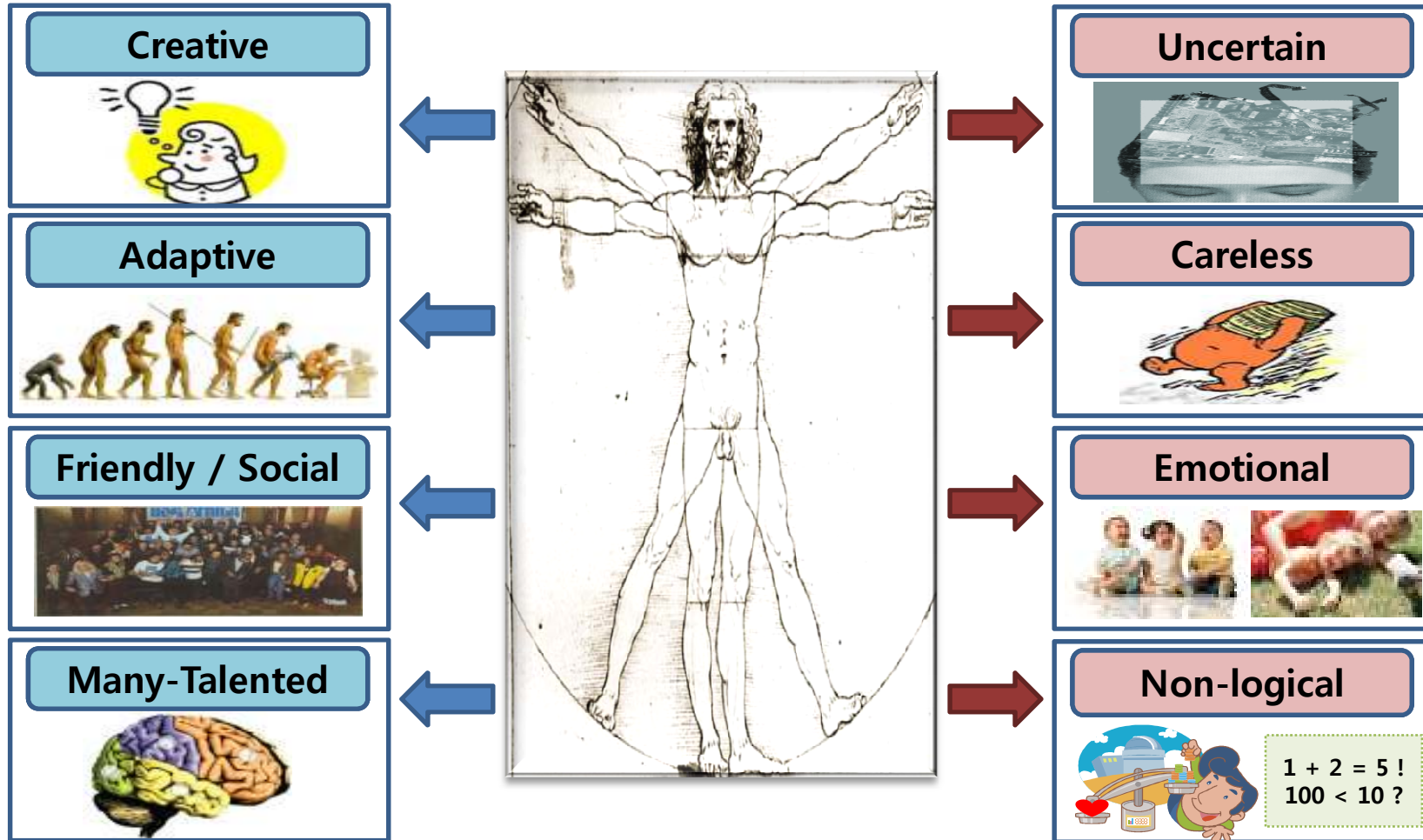
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Overview

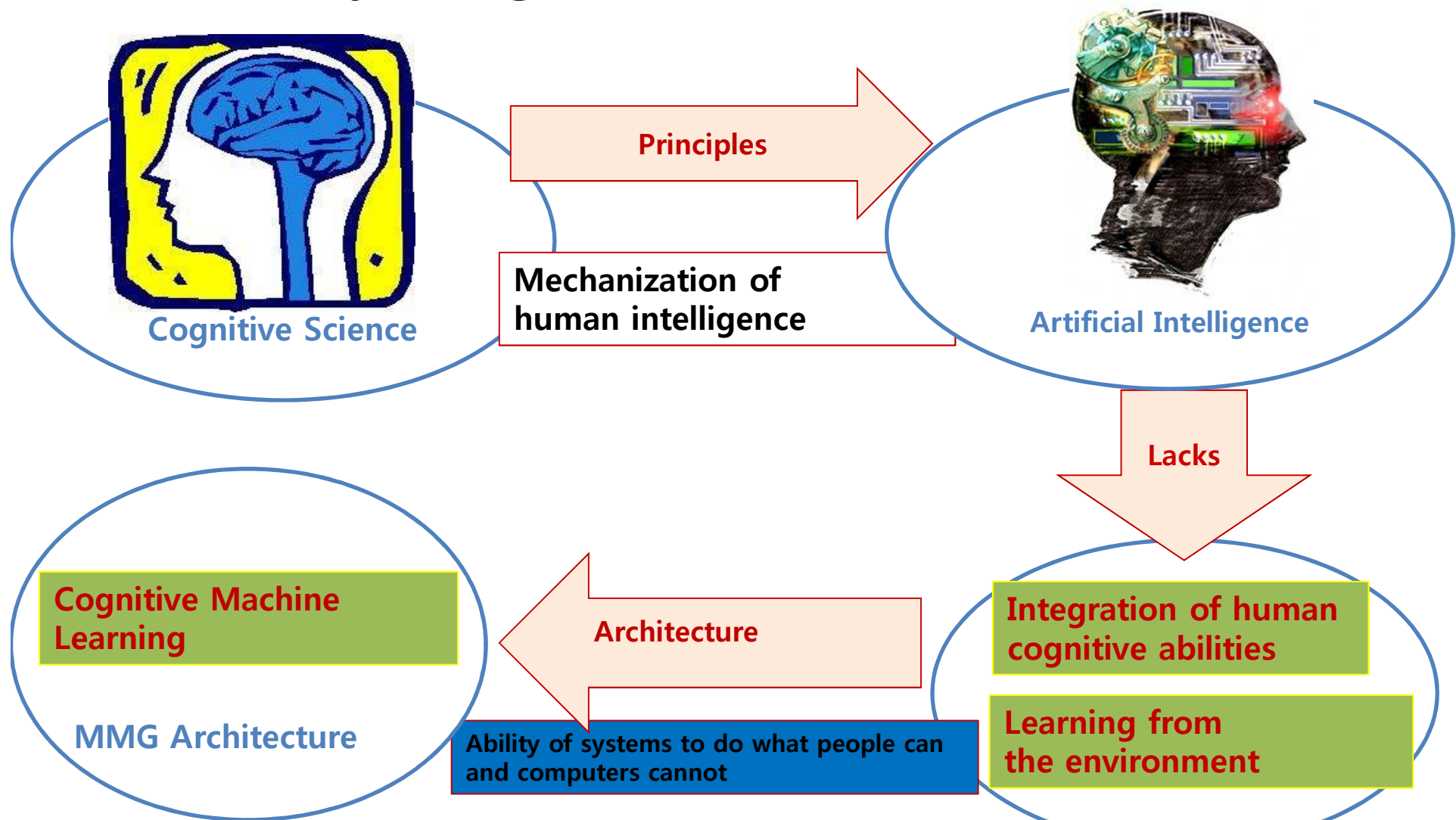
- Goal
 - Understand human recall memory for cognitive ML
 - Improve AI by integrating human intelligence mechanism
 - Practice research and technical writing
- Multimodal Memory Game (MMG)
 - Human recall memory game for cross-modal matching
 - Text-to-text (T2T) game
 - Text&image-to-text (TI2T) game
 - 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

Ultimate Goal: Human Level AI

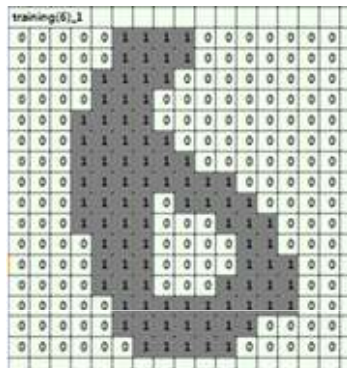


To reach 'Human-Level Intelligence', we need to imitate/reproduce various human attributes

Why Cognitive Science for AI?



Recognition vs. Recall Memory



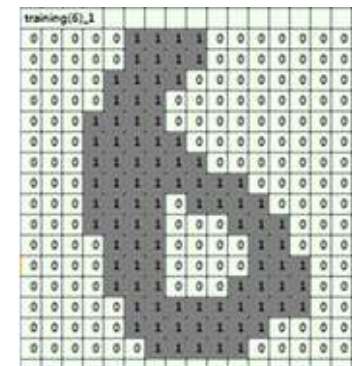
Recognition



"six"

"six"

Recall



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

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.

- You'll answer the next sentence



You could do that. You think?

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/~ganderso/biology/resources/writing/HTWsections.html>

Experimental process	Section of Paper
What did I do in a nutshell?	<u>Abstract</u>
What is the problem?	<u>Introduction</u>
How did I solve the problem?	<u>Materials and Methods</u>
What did I find out?	<u>Results</u>
What does it mean?	<u>Discussion</u>
Who helped me out?	<u>Acknowledgments (optional)</u>
Whose work did I refer to?	<u>Literature Cited</u>
Extra Information	<u>Appendices (optional)</u>

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.**

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)