

讓 AI 村民組成虛擬村莊 會發生甚麼事？

Joining for coffee at a cafe

KM:

AC:

[Abigail]: Hey Klaus, mind if I join for coffee?
[Klaus]: Not at all, Abigail. How are you?

Taking a walk in the park

Arriving at school

AK:

Sharing news with colleagues

JL:

TM:

Finishing a morning routine

JM:

[John]: Hey, have you heard anything new about the upcoming mayoral election?
[Tom]: No, not really. Do you know who is running?

Generative Agents: Interactive Simulacra of Human Behavior

Joon Sung Park
Stanford University
Stanford, USA
joonspk@stanford.edu

Joseph C. O'Brien
Stanford University
Stanford, USA
jobrien3@stanford.edu

Carrie J. Cai
Google Research
Mountain View, CA, USA
cjcai@google.com

Meredith Ringel Morris
Google Research
Seattle, WA, USA
merrie@google.com

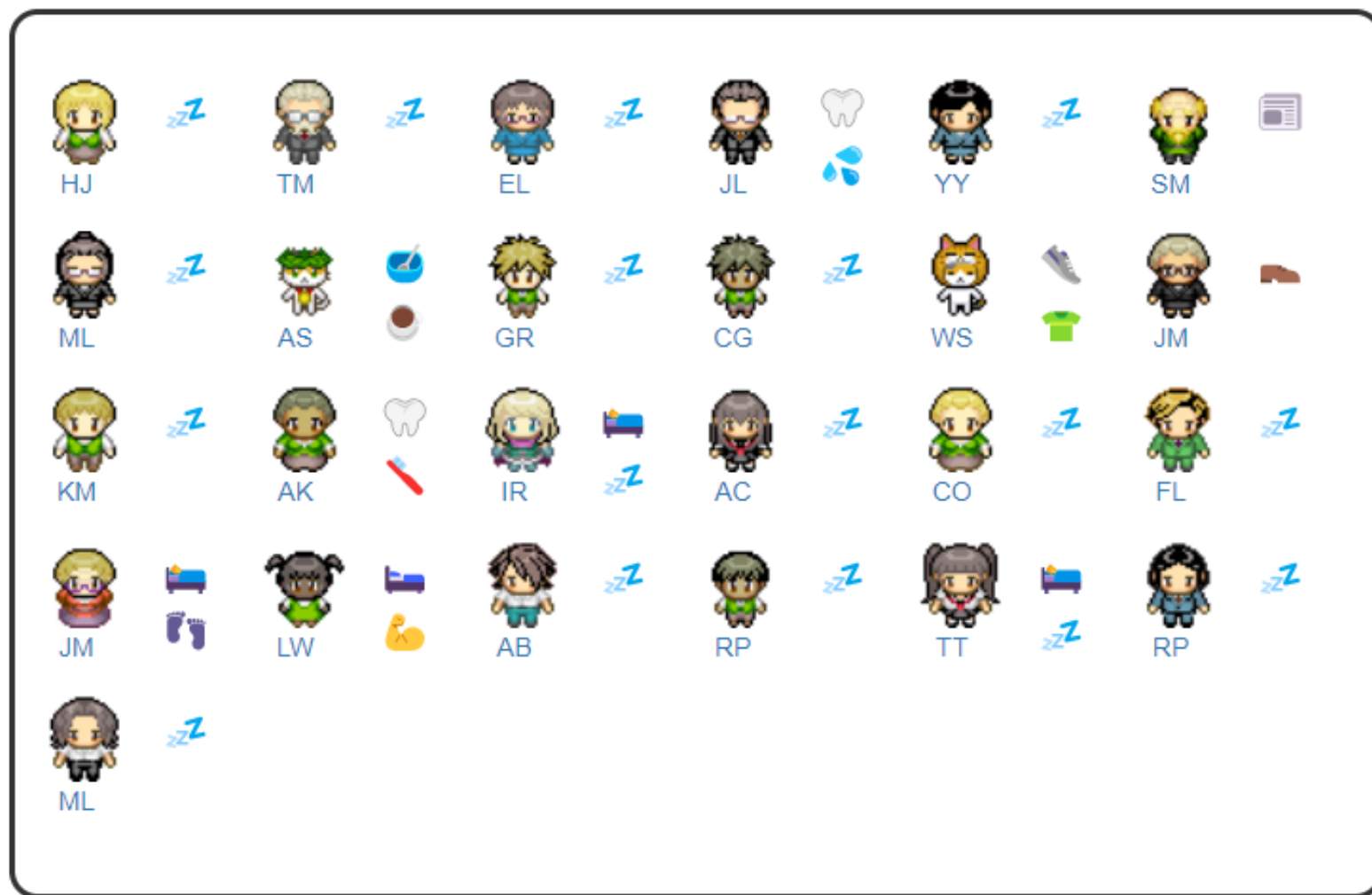
Percy Liang
Stanford University
Stanford, USA
плианг@cs.stanford.edu

Michael S. Bernstein
Stanford University
Stanford, USA
msb@cs.stanford.edu

Paper: <https://arxiv.org/abs/2304.03442>

Demo: https://reverie.herokuapp.com/arXiv_Demo/

由 ChatGPT 控制的 NPC



由 ChatGPT 控制的 NPC



Personality and Lifestyle

Innate tendency

friendly, outgoing, hospitable

Learned tendency

Isabella Rodriguez is a cafe owner of Hobbs Cafe who loves to make people feel welcome. She is always looking for ways to make the cafe a place where people can come to relax and enjoy themselves.

Currently

Isabella Rodriguez is planning on having a Valentine's Day party at Hobbs Cafe with her customers on February 14th, 2023 at 5pm. She is gathering party material, and is telling everyone she meets to join the party at Hobbs Cafe on *February 14th, 2023, from 5pm to 7pm*.

Lifestyle

Isabella Rodriguez goes to bed around 11pm, awakes up around 6am.

Joining for coffee at a cafe



[Abigail]: Hey Klaus, mind if I join you for coffee?
[Klaus]: Not at all, Abigail. How are you?

Taking a walk in the park



Arriving at school



Sharing news with colleagues



[John]: Hey, have you heard anything new about the upcoming mayoral election?
[Tom]: No, not really. Do you know who is running?

Finishing a morning routine



脫稿玩家 (Free Guy)



<https://www.4gamers.com.tw/news/detail/49342/free-guy-experience-the-real-life-of-npc>

ChatGPT

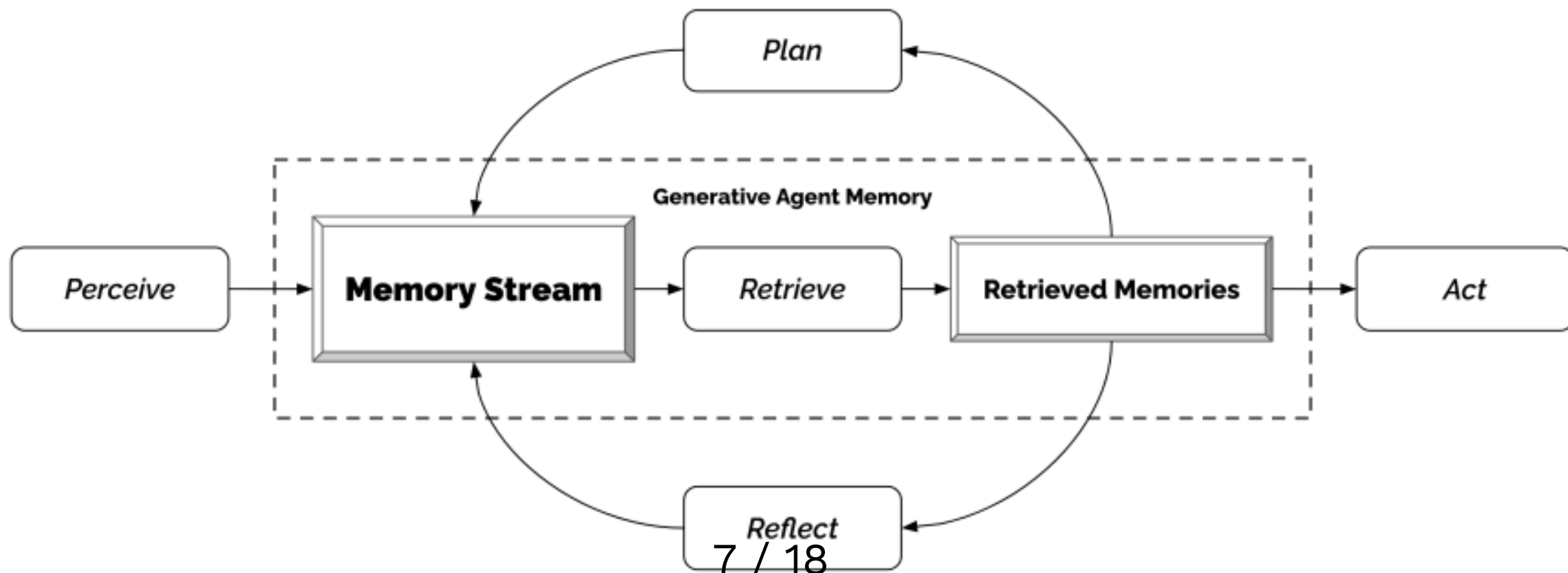


IR

行為説明

行為

"Isabella Rodriguez is
getting ready for bed"



AI 自己規劃一天

- 沒有計畫的腳色：
 - 12:00 pm 吃午餐
 - 12:30 pm 吃午餐
 - 1:00 pm 吃午餐 ...

- 1) wake up and complete the morning routine at 8:00 am,
- 2) go to Oak Hill College to take classes starting 10:00 am, [...]
- 5) work on his new music composition from 1:00 pm to 5:00 pm,
- 6) have dinner at 5:30 pm,
- 7) finish school assignments and go to bed by 11:00 pm."

Name: Eddy Lin (age: 19)

Innate traits: friendly, outgoing, hospitable

Eddy Lin is a student at Oak Hill College studying music theory and composition. He loves to explore different musical styles and is always looking for ways to expand his knowledge. Eddy Lin is working on a composition project for his college class. He is also taking classes to learn more about music

theory. Eddy Lin is excited about the new composition he is working on but he wants to dedicate more hours in the day to work on it in the coming days

1) woke up and
at 7:00 am, [...]

0 pm.

3. Here is Eddy's

plan Eddy in broad strokes. 1)

- 1) wake up and complete the morning routine at 8:00 am,
- 2) go to Oak Hill College to take classes starting 10:00 am, [. . .]
- 5) work on his new music composition from 1:00 pm to 5:00 pm,
- 6) have dinner at 5:30 pm,
- 7) finish school assignments and go to bed by 11:00 pm.”



1:00 pm: start by brainstorming some ideas for his music composition [...]

4:00 pm: take a quick break and recharge his creative energy before reviewing and polishing his composition.



4:00 pm: grab a light snack, such as a piece of fruit, a granola bar, or some nuts.

4:05 pm: take a short walk around his workspace [...]

4:50 pm: take a few minutes to clean up his workspace.

Morning routine



Waking up



Brushing teeth



Taking a shower



Cooking breakfast

Catching up



Packing



Beginning workday



6:00 am

...

7:30 am

7:45 am

8:00 am

來自外界的刺激



ChatGPT

IR

太瑣碎了!

[node_1048] 2023-02-13 20:58:10: **bed is being slept in**

[node_1047] 2023-02-13 20:54:00: **desk is idle**

[node_1046] 2023-02-13 20:54:00: **bed is idle**

[node_1045] 2023-02-13 20:53:50: **closet is idle**

[node_1044] 2023-02-13 20:53:50: **refrigerator is idle**

[node_1043] 2023-02-13 20:53:50: **bed is not being used**

[node_1042] 2023-02-13 20:53:10: **shelf is idle**

[node_1041] 2023-02-13 20:53:10: **Isabella Rodriguez is taking a break**

[node_1040] 2023-02-13 20:43:50: **shelf is in use**

[node_1039] 2023-02-13 20:43:10: **Isabella Rodriguez is doing the dishes**

[node_1038] 2023-02-13 20:13:30: **desk is idle**

[node_1037] 2023-02-13 20:13:30: **bed is idle**

[node_1036] 2023-02-13 20:13:20: **closet is idle**

[node_1035] 2023-02-13 20:13:20: **refrigerator is idle**

[node_1034] 2023-02-13 20:13:20: **bed is being slept in**

[node_1033] 2023-02-13 20:13:10: **shelf is idle**

[node_1032] 2023-02-13 20:13:10: **Isabella Rodriguez is talking with her family**

[node_1031] 2023-02-13 19:58:10: **Isabella Rodriguez is cleaning up the kitchen**

[node_1030] 2023-02-13 19:28:30: **refrigerator is closed**

Reflect: 對記憶的詮釋

- 何時 Reflect ? 最近有夠多重要的記憶
- 要 Reflect 甚麼 ?
 - “Given only the information above, what are 3 most salient high-level questions we can answer about the subjects in the statements?”
 - E.g., “What is the relationship between Klaus Mueller and Maria Lopez?”
- 用上述問題檢索記憶
 - 根據重要性、即時性、關聯性
- Reflect 的結果放入記憶

On the scale of 1 to 10, where 1 is purely mundane (e.g., brushing teeth, making bed) and 10 is extremely poignant (e.g., a break up, college acceptance), rate the likely poignancy of the following piece of memory.

Memory: buying groceries at The Willows Market and Pharmacy

Rating: <fill in>

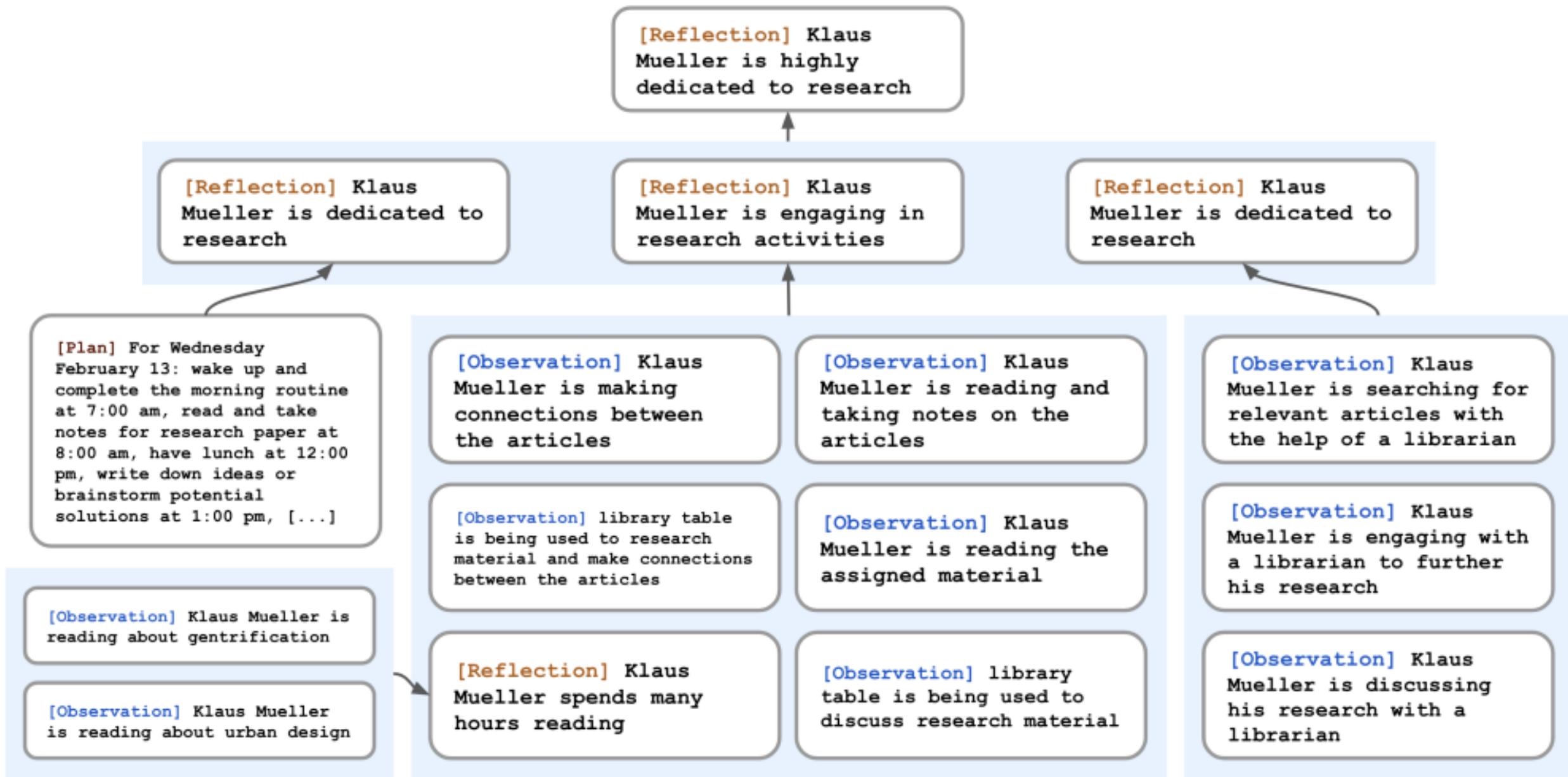
Statements about Klaus Mueller

1. Klaus Mueller is writing a research paper

2. Klaus Mueller enjoys reading a book on gentrification

3. Klaus Mueller is conversing with Ayesha Khan about exercising [...]

What 5 high-level insights can you infer from the above statements? (example format: insight (because of 1, 5, 3))



Agent's Thought (Reflect?)

Demo: https://reverie.herokuapp.com/arXiv_Demo/



ML

[node_14] 2023-02-13 00:01:30: **Maria Lopez is close friends with Ayesha Khan, who is both a classmate and a dormmate of hers.**

(Depth: 1; Evidence: None)

[node_13] 2023-02-13 00:01:30: **Maria Lopez often visits Hobbs Cafe to plan and study.**

(Depth: 1; Evidence: None)

[node_12] 2023-02-13 00:01:30: **Maria Lopez is close friends and classmates with Klaus Mueller.**

(Depth: 1; Evidence: None)

[node_11] 2023-02-13 00:01:30: **Maria Lopez and Klaus Mueller have been friends for over 2 years.**

(Depth: 1; Evidence: None)

[node_10] 2023-02-13 00:01:30: **Maria Lopez has a secret crush on Klaus Mueller.**

(Depth: 1; Evidence: None)



KM

[node_13] 2023-02-13 00:01:30: **Klaus Mueller is a dormmate of Maria Lopez.**

(Depth: 1; Evidence: None)

[node_12] 2023-02-13 00:01:30: **Klaus Mueller is close with Ayesha Khan, who is both a classmate and a dormmate of his.**

(Depth: 1; Evidence: None)

[node_11] 2023-02-13 00:01:30: **Klaus Mueller is close friends and classmates with Maria Lopez.**

(Depth: 1; Evidence: None)

[node_10] 2023-02-13 00:01:30: **Klaus Mueller and Maria Lopez have been friends for more than 2 years.**

(Depth: 1; Evidence: None)

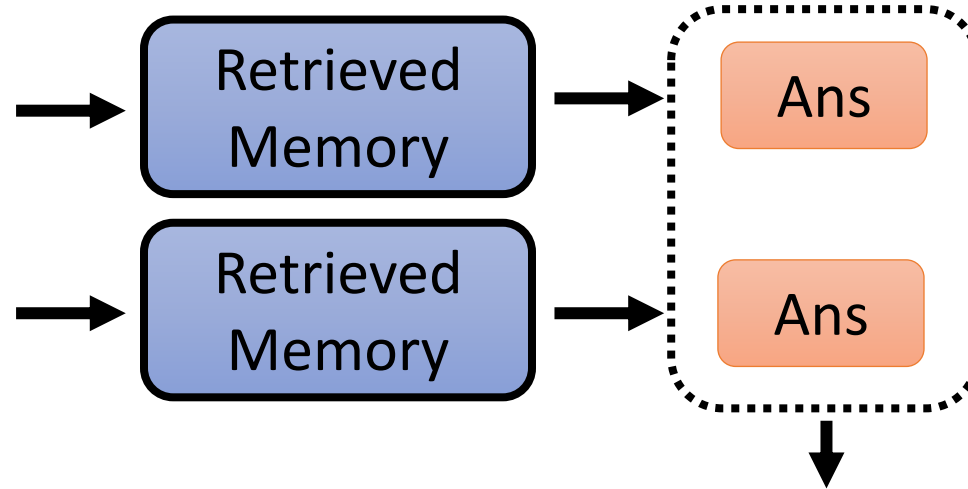
[node_9] 2023-02-13 00:01:30: **Klaus Mueller has a crush on Maria Lopez.**

(Depth: 1; Evidence: None)

根據外界的刺激改變計畫

What is [observer]'s relationship with the [observed entity]?

“[Observed entity] is [action status of the observed entity]”



Should John react to the observation, and if so, what would be an appropriate reaction?

John could consider asking Eddy about his music composition project.

New plan

[Agent's Summary Description]

It is February 13, 2023, 4:56 pm.

John Lin's status: John is back home early from work.

Observation: John saw Eddy taking a short walk around his workplace.

Summary of relevant context from John's memory: Eddy Lin is John's Lin's son. Eddy Lin has been working on a music composition for his class. Eddy Lin likes to walk around the garden when he is thinking about or listening to music.

AI 間的對話

[Agent's Summary Description]

It is February 13, 2023, 4:56 pm.

John Lin's status: John is back home early from work.

Observation: John saw Eddy taking a short walk around his workplace.

Summary of relevant context from John's memory: Eddy Lin is John's Lin's son. Eddy Lin has been working on a music composition for his class. Eddy Lin likes to walk around the garden when he is thinking about or listening to music.

John is asking Eddy about his music composition project. What would he say to Eddy?



“Hey Eddy, how’s the music composition project for your class coming along?”

[Agent's Summary Description]

It is February 13, 2023, 4:56 pm.

Eddy Lin's status: Eddy is taking a short walk around his workplace.

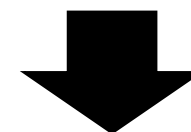
Observation: John is initiating a conversation with Eddy.

Summary of relevant context from Eddy's memory: Jonn Lin is Eddy Lin's father. John Lin is caring and is interested to learn more about Eddy Lin's school work. John Lin knows that Eddy Lin is working on a music composition.

Here is the dialogue history:

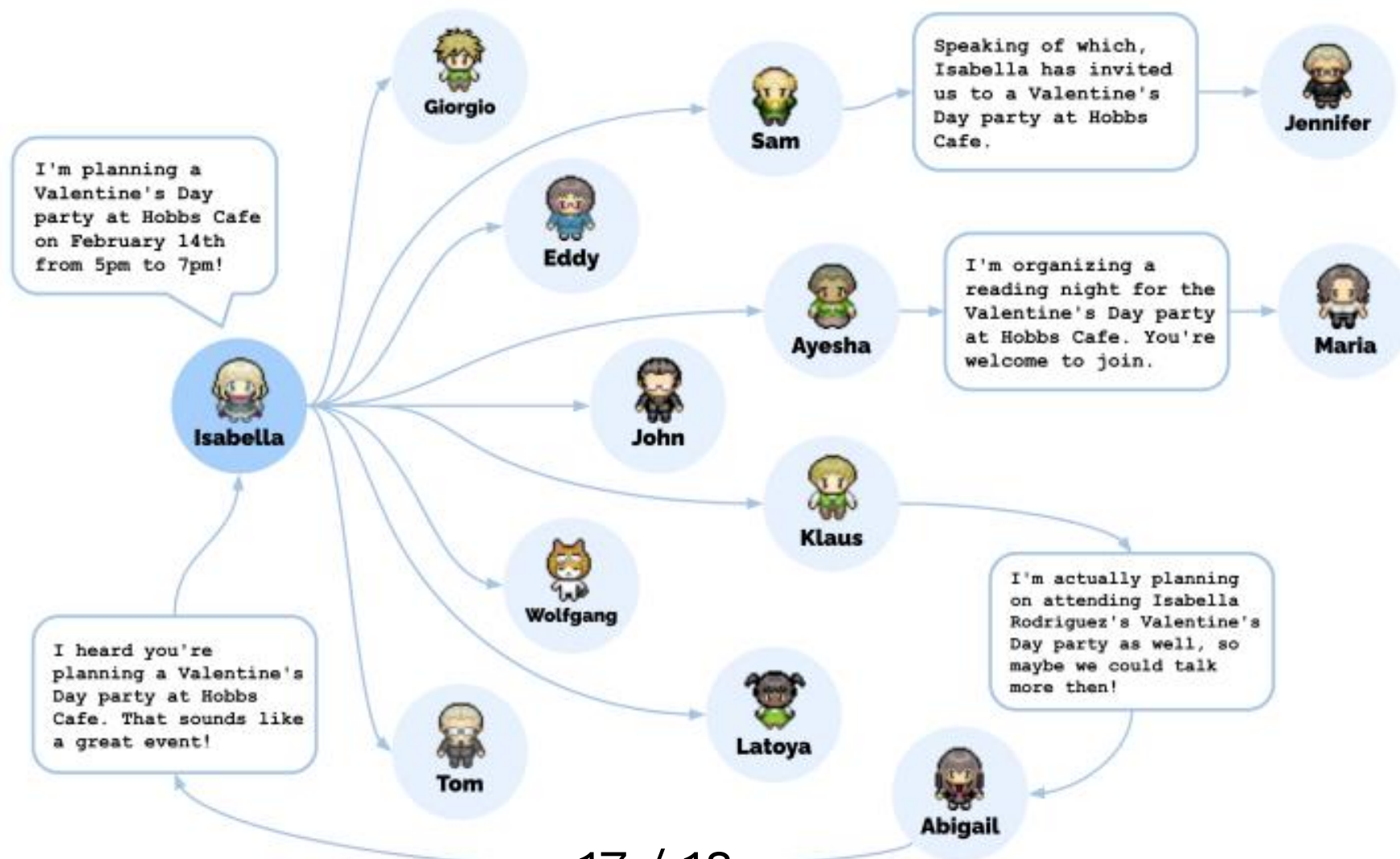
John: Hey Eddy, how's the music composition project for your class coming along?

How would Eddy respond to John?



“Hey Dad, it’s going well. I’ve been taking walks around the garden to clear”

情人節活動訊息散佈



情人節當天活動狀況

Maria invites Klaus,
her secret crush,
to join her at the party,
and he gladly accepts.

