讓 AI 村民組成虛擬村莊會發生甚麼事？

Generative Agents: Interactive Simulacra of Human Behavior

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

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

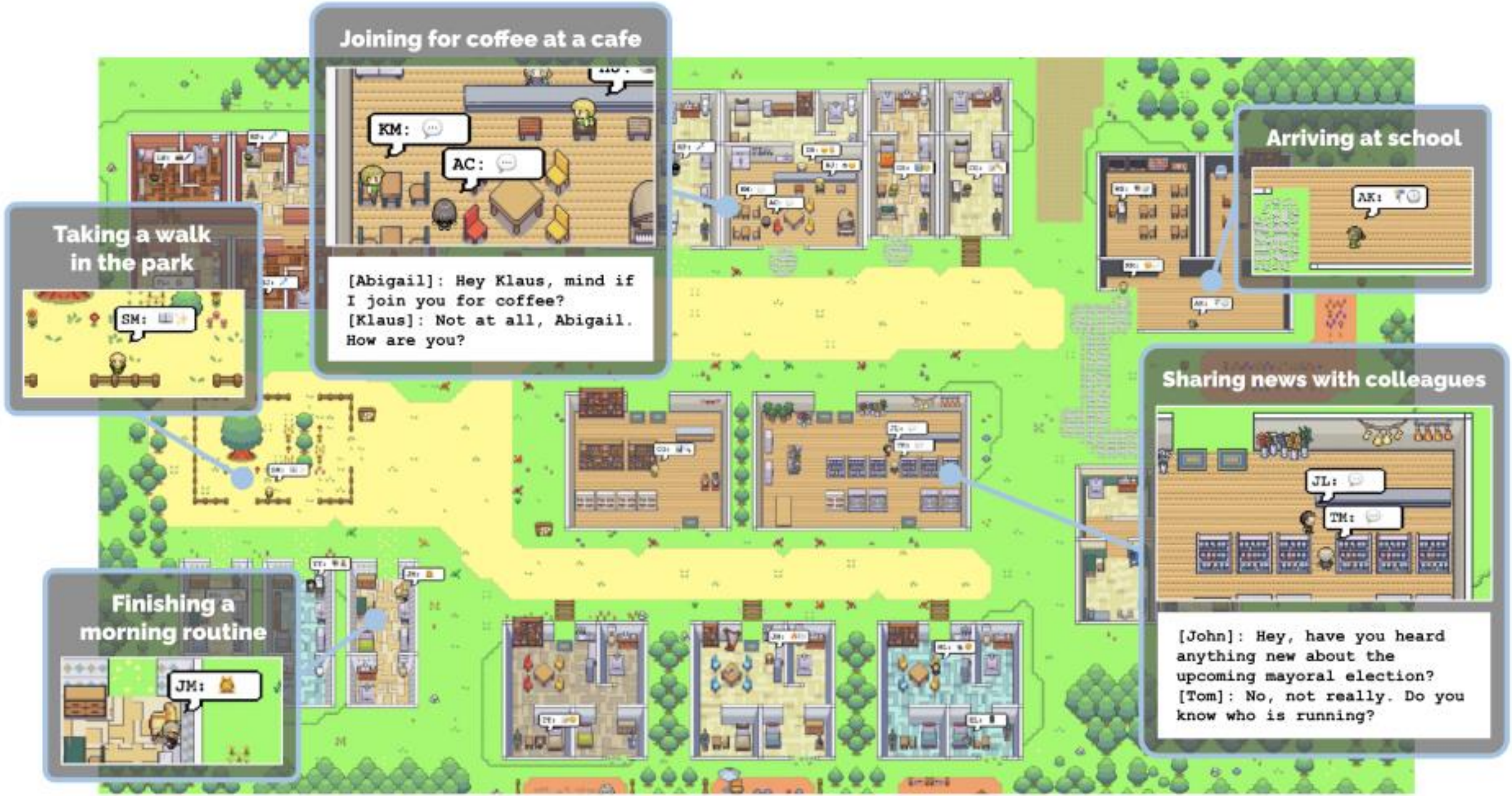
由 ChatGPT 控制的 NPC

由 ChatGPT 控制的 NPC

IR

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, an 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
KM:
AC:
[Abigail]: Hey Klaus, mind if I join you for coffee?
[Klaus]: Not at all, Abigail. How are you?
Arriving at school
AK:
Taking a walk in the park
SM:
Sharing news with colleagues
JL:
TM:
[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
JM:

脫稿玩家 (Free Guy)

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

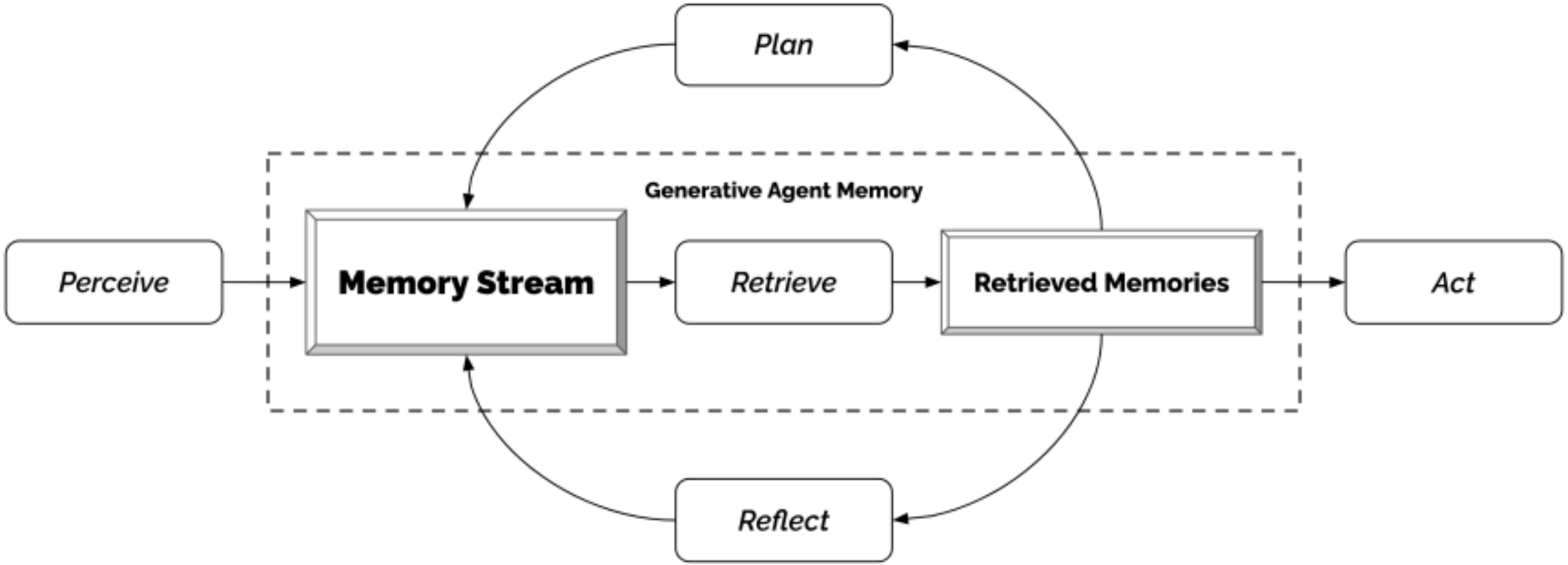
ChatGPT

IR

行為說明

"Isabella Rodriguez is getting ready for bed“

行為



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 ...

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) 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) woke up and
t 7:00 am, [. . .]
pm.
3. Here is Eddy's

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

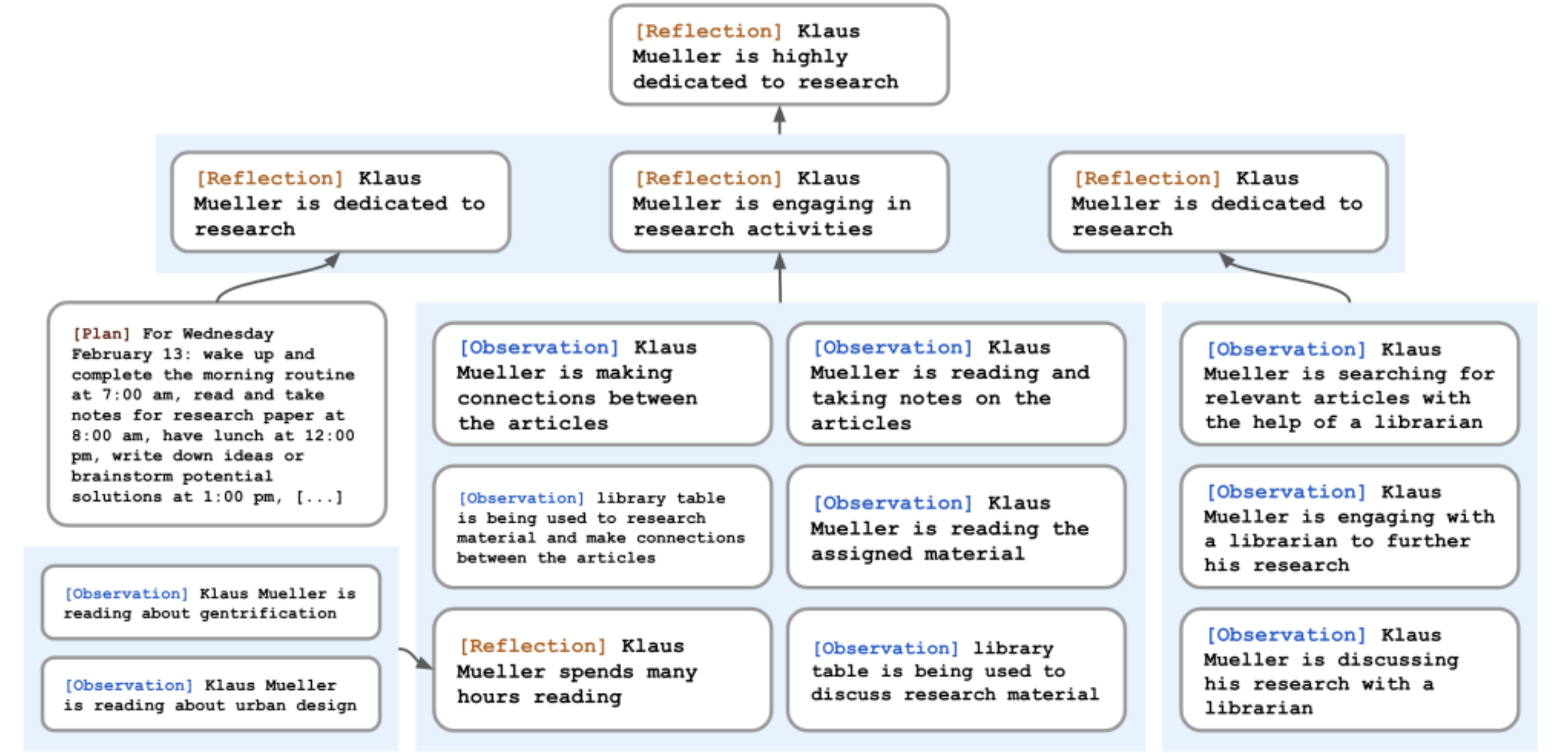
```
On the scale of 1 to 10, where 1 is purely mundane
(e.g., brushing teeth, making bed) and 10 is
extremely poignant (e.g., a break up, college
acceptance), rate the likely poignancy of the
following piece of memory.
Memory: buying groceries at The Willows Market
and Pharmacy
Rating: <fill in>
```

- 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

```
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))
```

- Reflect 的結果放入記憶


[Reflection] Klaus Mueller is highly dedicated to research
[Reflection] Klaus Mueller is dedicated to research
[Reflection] Klaus Mueller is engaging in research activities
[Reflection] Klaus Mueller is dedicated to research
[Plan] For Wednesday February 13: wake up and complete the morning routine at 7:00 am, read and take notes for research paper at 8:00 am, have lunch at 12:00 pm, write down ideas or brainstorm potential solutions at 1:00 pm, [...]
[Observation] Klaus Mueller is reading about gentrification
[Observation] Klaus Mueller is reading about urban design
[Observation] Klaus Mueller is making connections between the articles
[Observation] Klaus Mueller is reading and taking notes on the articles
[Observation] library table is being used to research material and make connections between the articles
[Observation] Klaus Mueller is reading the assigned material
[Reflection] Klaus Mueller spends many hours reading
[Observation] library table is being used to discuss research material
[Observation] Klaus Mueller is searching for relevant articles with the help of a librarian
[Observation] Klaus Mueller is engaging with a librarian to further his research
[Observation] Klaus Mueller is discussing his research with a librarian

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)

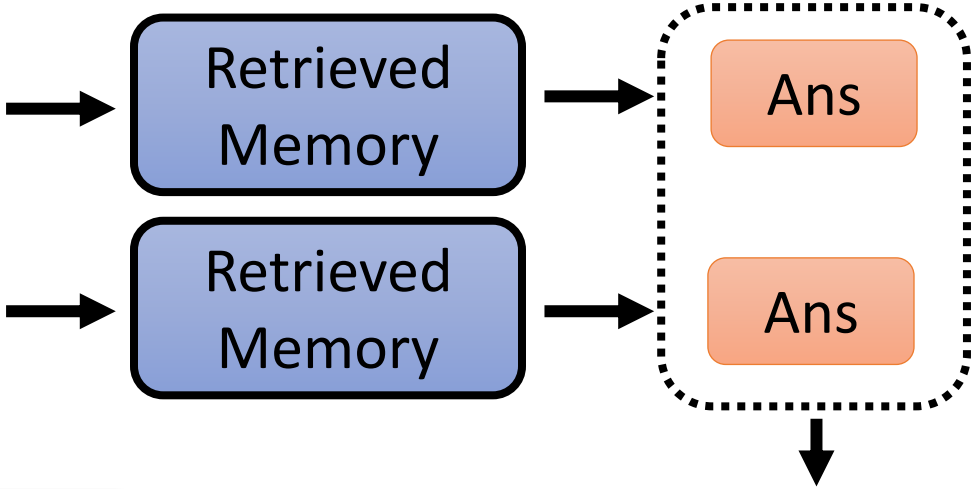
[node_10] 2023-02-13 00:01:30: **Klaus Mueller and Maria Lopez have been friends for more than 2 years.**
(Depth: 1; Evidence: None)

[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]



[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.

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

AI 間的對話

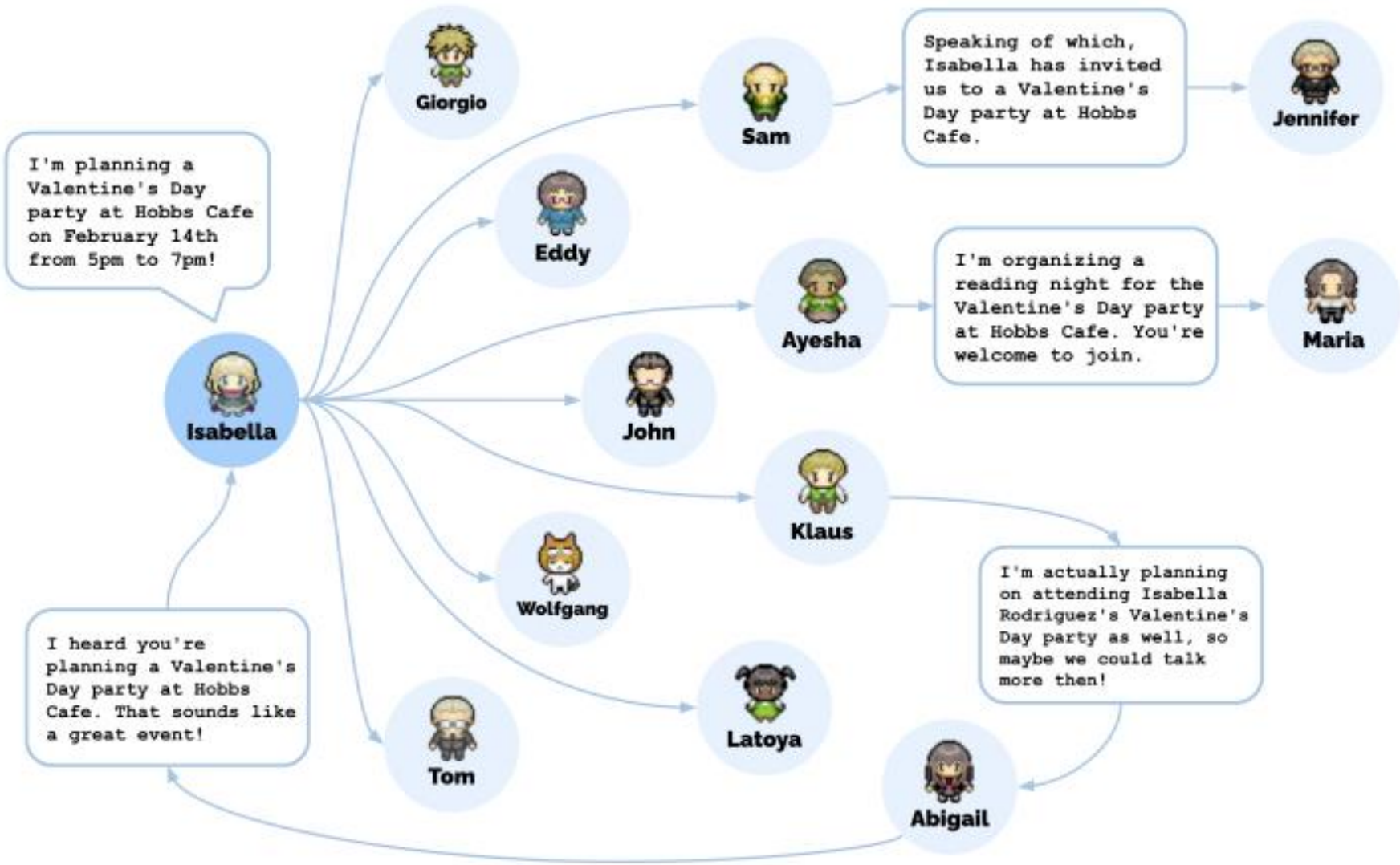
[Agent's Summary Description]
It is February 13, 2023, 4:56 pm.
John Lin's status: John is back home early from work.
Observation: John saw Eddy taking a short walk around his workplace.
Summary of relevant context from John's memory: Eddy Lin is John's Lin's son. Eddy Lin has been working on a music 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


I'm planning a Valentine's Day party at Hobbs Cafe on February 14th from 5pm to 7pm!
Isabella
Giorgio
Eddy
Sam
Speaking of which, Isabella has invited us to a Valentine's Day party at Hobbs Cafe.
Jennifer
Ayesha
I'm organizing a reading night for the Valentine's Day party at Hobbs Cafe. You're welcome to join.
Maria
John
Klaus
Wolfgang
I'm actually planning on attending Isabella Rodriguez's Valentine's Day party as well, so maybe we could talk more then!
I heard you're planning a Valentine's Day party at Hobbs Cafe. That sounds like a great event!
Tom
Latoya
Abigail

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.