

HUMAN-AI NETWORK COORDINATION:

REVISITING THE LEAVITT-BAVELAS EXPERIMENT

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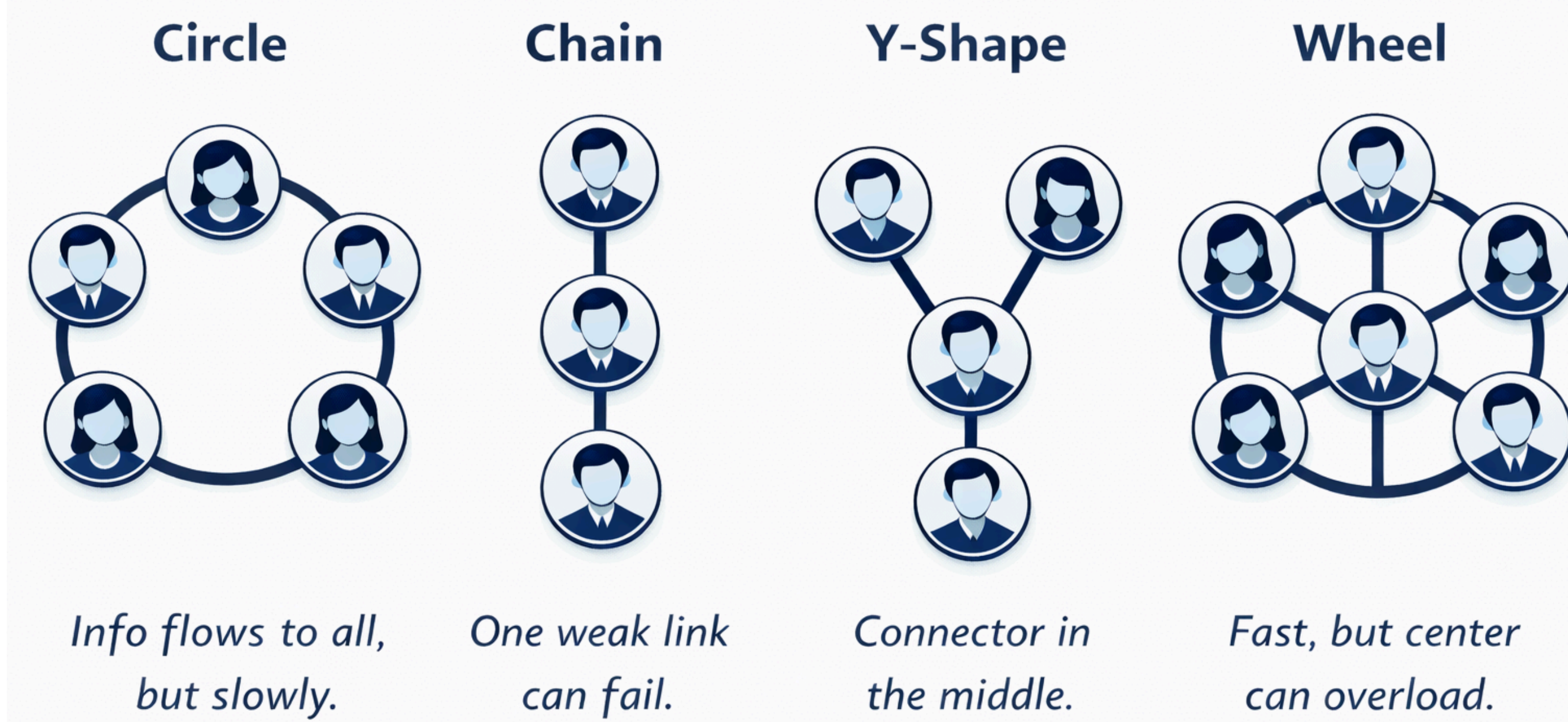


BACKGROUND

Prior Research Findings:

- The Bavelas-Leavitt experiments showed that **restricting who can talk to whom** (network topology) changes how teams coordinate.

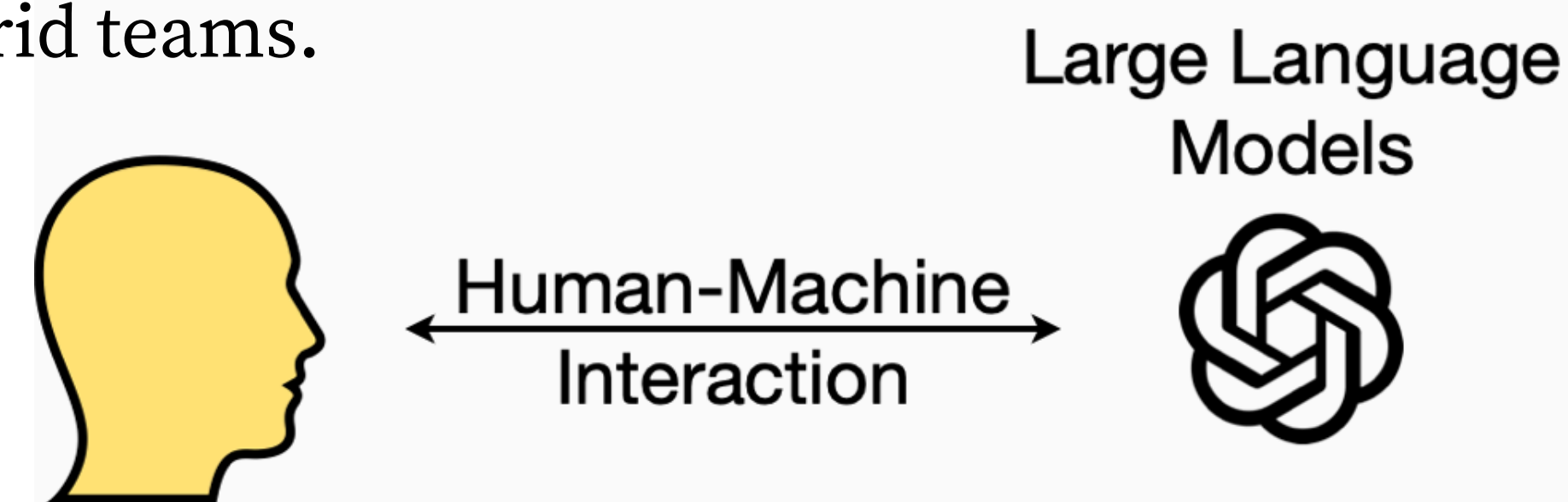
COMMUNICATION TOPOLOGIES



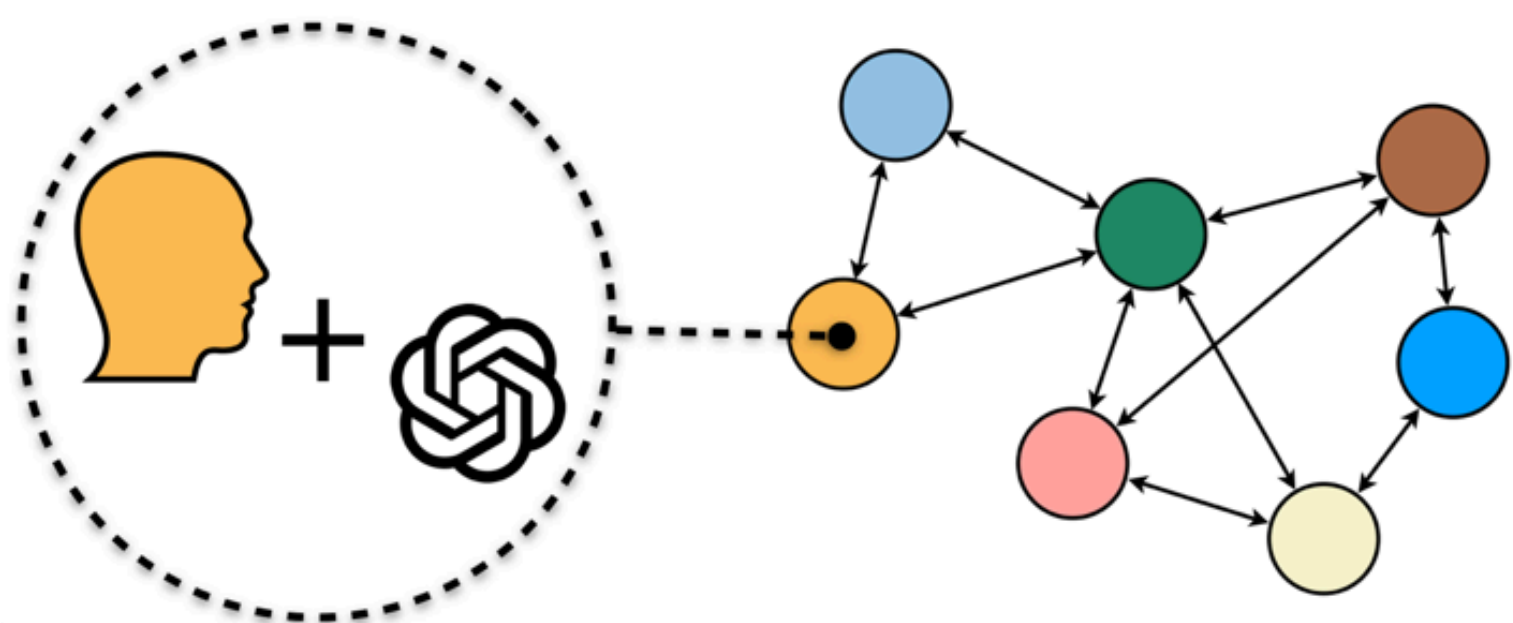
- In the experiment, five participants each had a set of figures (B) with exactly **one shared figure**, and they had to identify it while messaging only the allowed specific people.

Can HUMANS & AI Collaborate?

- The project first **replicates** the Bavelas-Leavitt experiment.
- Then **adds human** participants to compare AI-only, human-only, and hybrid teams.



- In the longer term, the project aims to **build a game platform** where mixed human-AI teams compete against other teams.



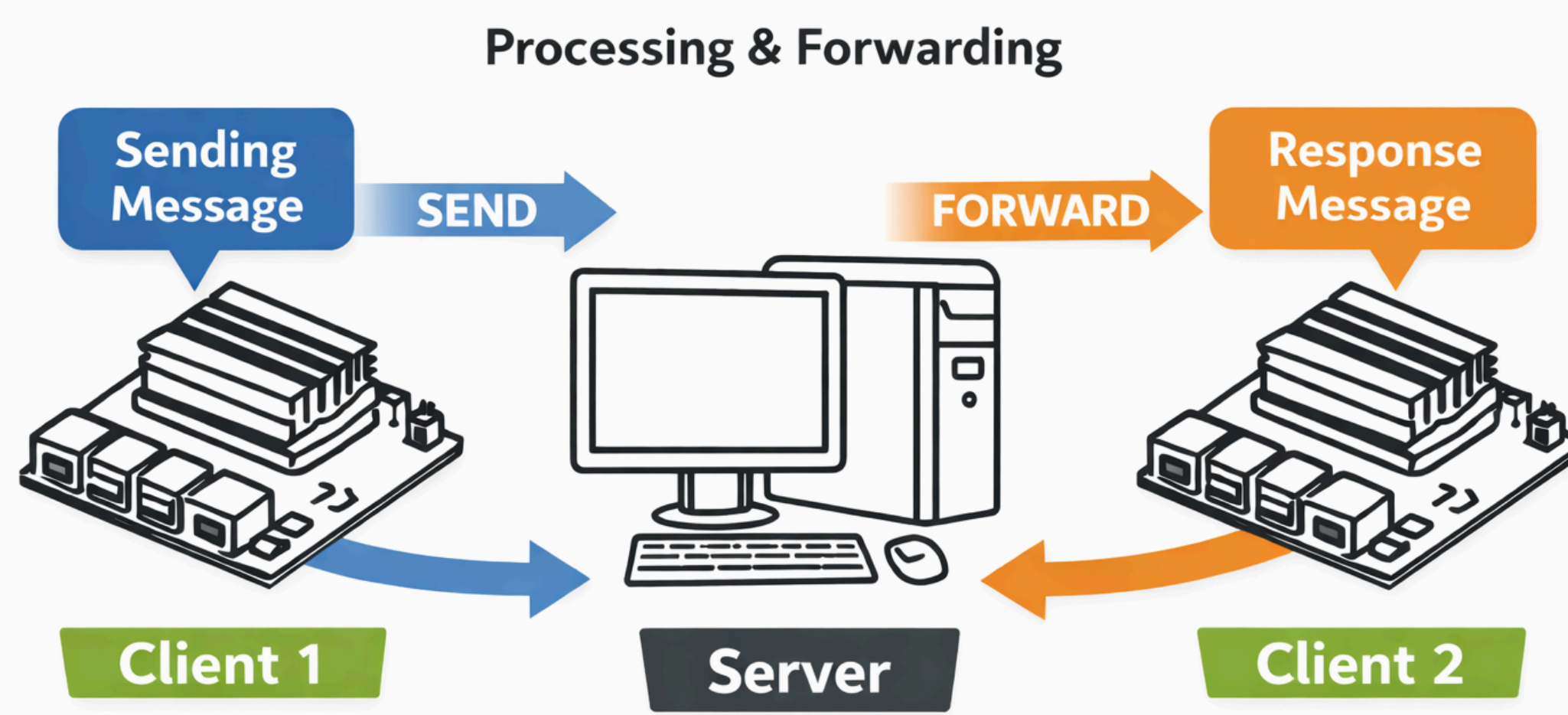
METHODS

- Devices:** Two NVIDIA Jetson Orin Nano Developer Kits, each running one local language-model agent (gemma3).



Jetson Orin Nano Developer Kit

- Client-server control:** Python client/server system; Jetsons are clients, an external computer runs the server for trial control and logging.



- Task materials:** Code randomizes and assigns symbols (B) to each agent to mirror the Bavelas-Leavitt setup.

Six Symbols Used: $\triangle \diamond \square + *$

Trial No.	Symbol Missing From:	White	Red	Brown	Yellow	Blue	Common Symbol
1		\triangle	\diamond	$*$	\circ	\square	$+$
2		\diamond	\circ	\square	\triangle	$+$	$*$
3		$+$	$*$	\square	\triangle	\diamond	\circ
4		\square	\diamond	\triangle	$*$	$+$	\circ

(B)

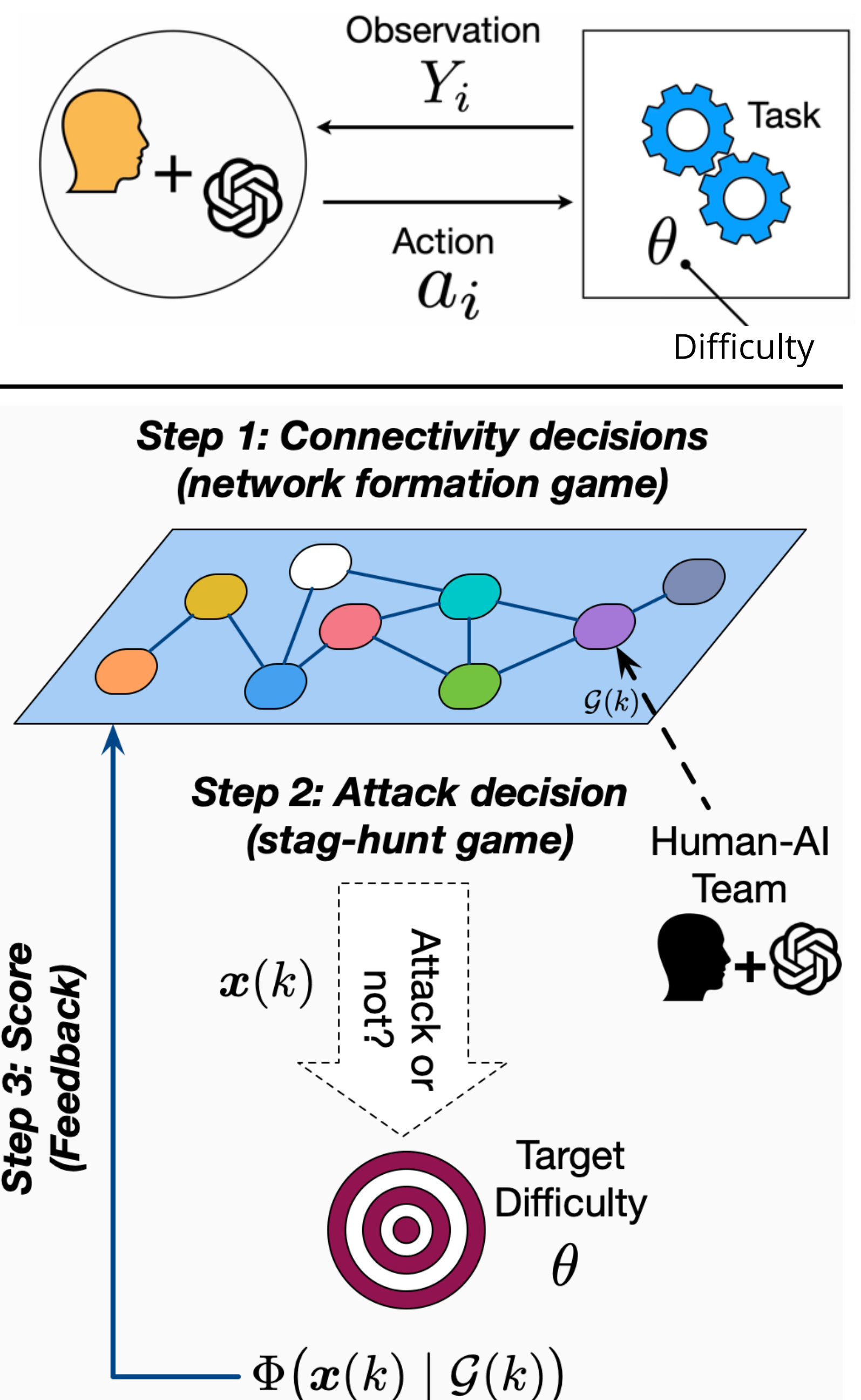
- Prompt design:** Prompts specify the task, rules, and communication limits.

RESULTS

- The two Jetsons can communicate and repeat the experiment.

FUTURE DIRECTIONS

- Future work will turn the experiment into a scalable 5v5 game platform where AI-only and human-AI teams compete under network-based communication limits.
- The platform will include a **network-formation phase** (choosing neighbors), an **action phase** (attack/defend), and **scoring/feedback** across rounds to study strategy and coordination failures over play.



REFERENCES & ACKNOWLEDGEMENTS



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