

Tactical Autonomous Language-Operated Network

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1 | Overview

2 | SMAX

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- ▶ User interacts with system through the LLM...
- ▶ ... or directly while being advised by the LLM.

2 | SMAX

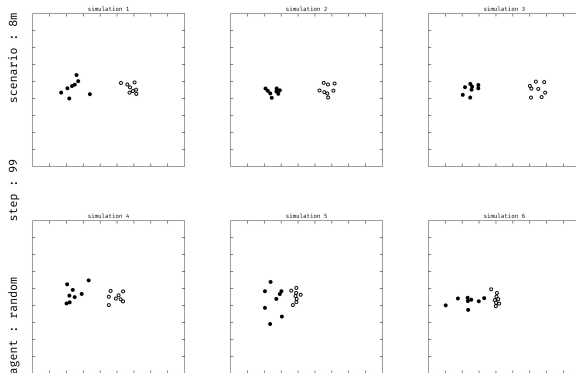


Figure 1: Running parallel SMAX environments

2 | SMAX (cont.)

- ▶ Trying to get SMAX [2] to work.
- ▶ SMAX is something something something something
- ▶ Focus on unitcontrol (no buildings, resources, etc).

3 | Behavior trees

- ▶ Currently trying to get BT to work.
- ▶ LLM should make structured output.
- ▶ This output must be BT, following a grammar.

- ▶ Tools:

- ▶ Overview by Lin [1]
- ▶ Grammar maker ^a.
- ▶ Pydantic ^b.

^a<https://grammar.intrinsiclabs.ai/>

^b<https://github.com/pydantic/pydantic>

3 | Behavior trees (cont.)

- ▶ BT output should follow a grammar.
- ▶ Military people like formal systems.
- ▶ BT should be formalized and validated.
- ▶ BT should be used for unit control and command issuing.
- ▶ Current approach is to represent behaviors trees as

4 | Atomic functions

- ▶ Manually written.
- ▶ Should written with genetic programming?

5 | Mistral

- 1 - LLM should output (or select) BT.
- 2 - BT should be used for unit control.

References

- [1] Timothy Lin. *Generating Structured Output from LLMs*.
<https://www.timlrx.com/blog/generating-structured-output-from-llms>. Nov. 2023.
- [2] Alexander Rutherford et al. *JaxMARL: Multi-Agent RL Environments in JAX*. Dec. 2023. DOI:
10.48550/arXiv.2311.10090. arXiv: 2311.10090 [cs].