

Agent of Rivia

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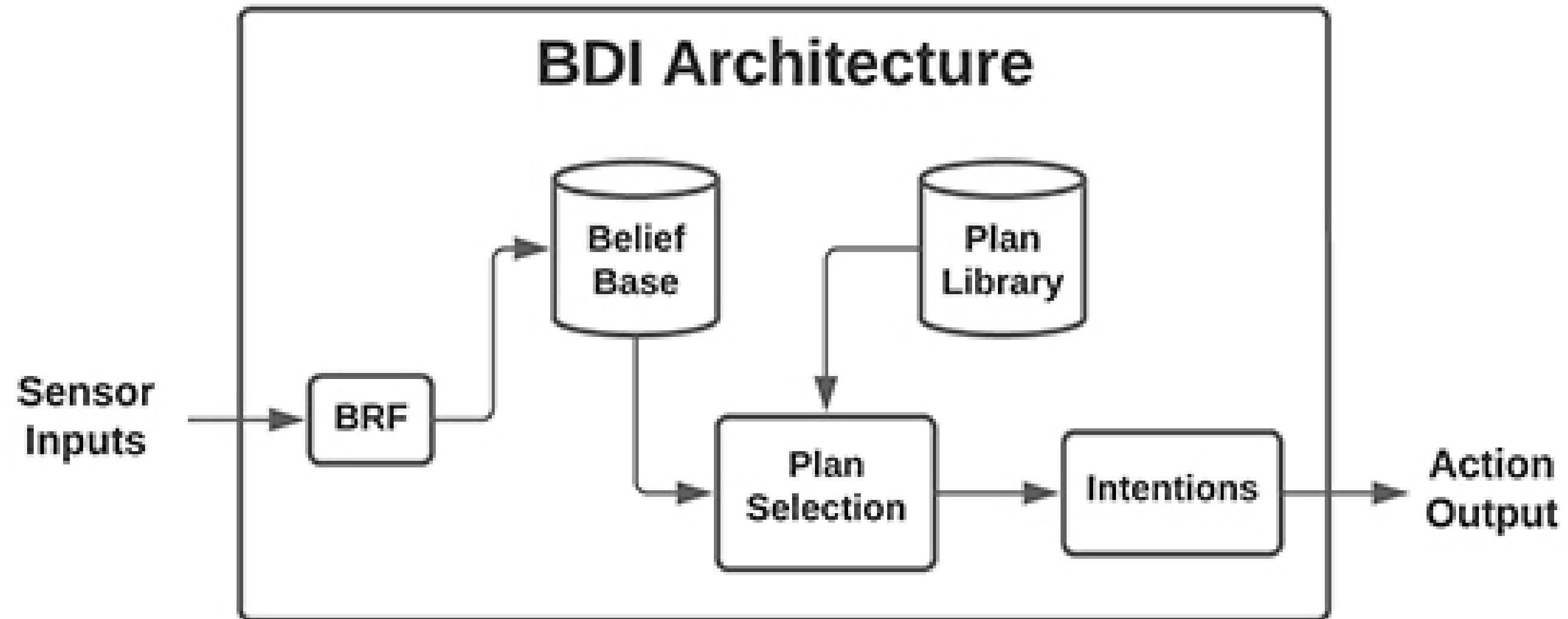
Introduction



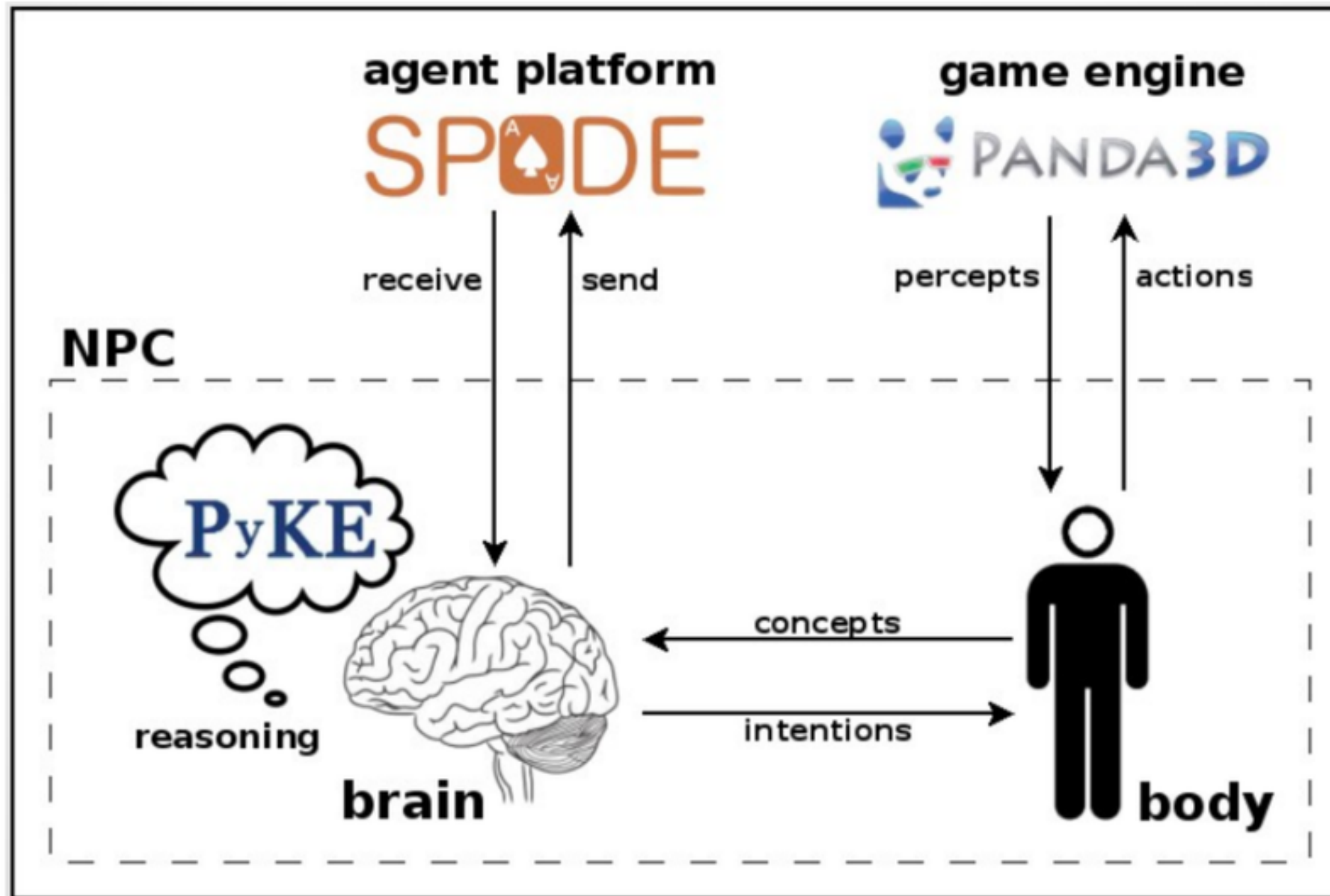
Background

Agent of Rivia is a multi-agent system inspired by The Witcher. A Hero agent explores a grid-based world, battles fantasy creatures, gains health and strength through victories, and can recover in a healing area. The project is implemented in Java, with agent behaviors developed in Jason and a Java Swing graphical interface.

BDI Architecture



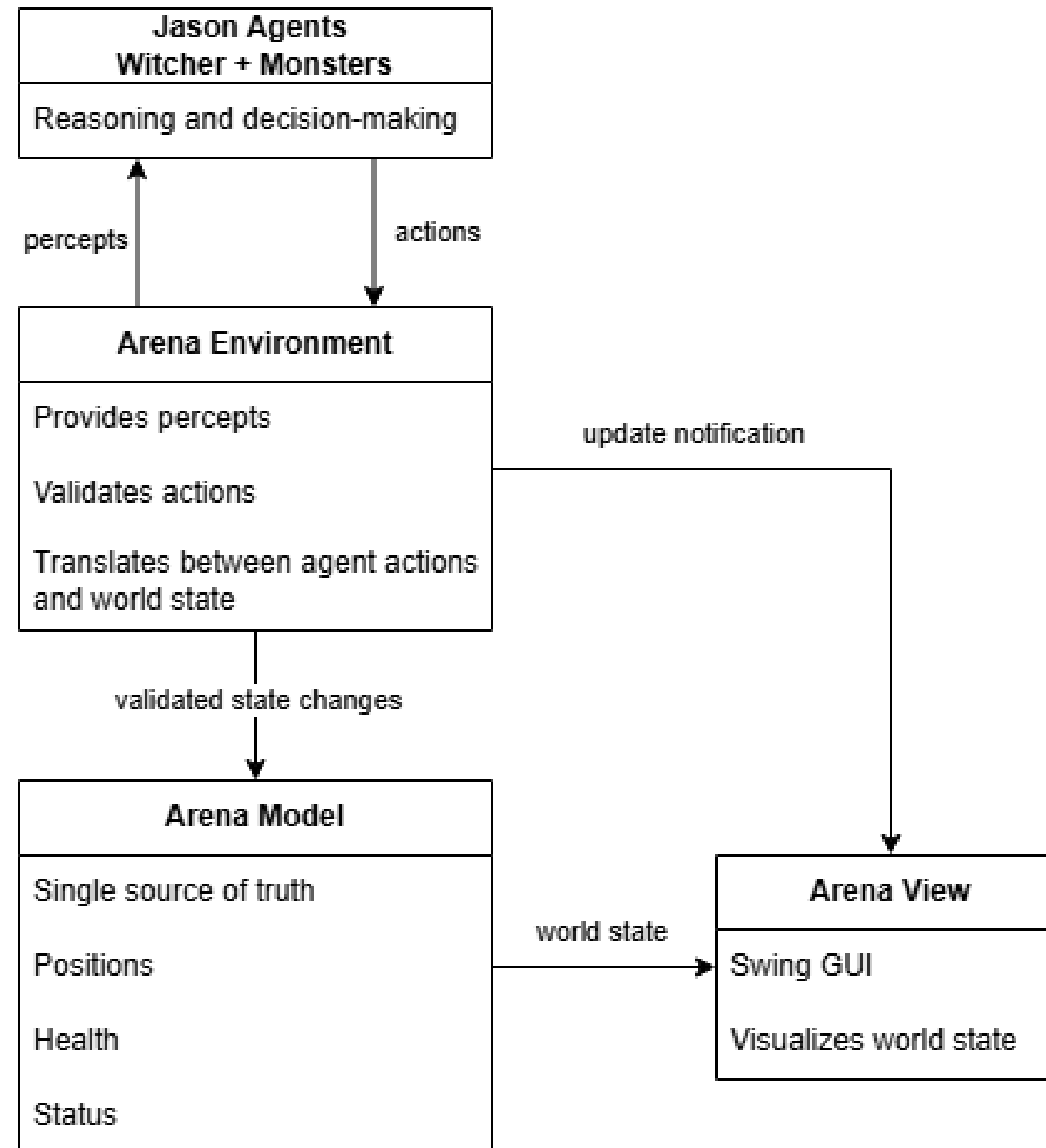
Brain - Body Separation



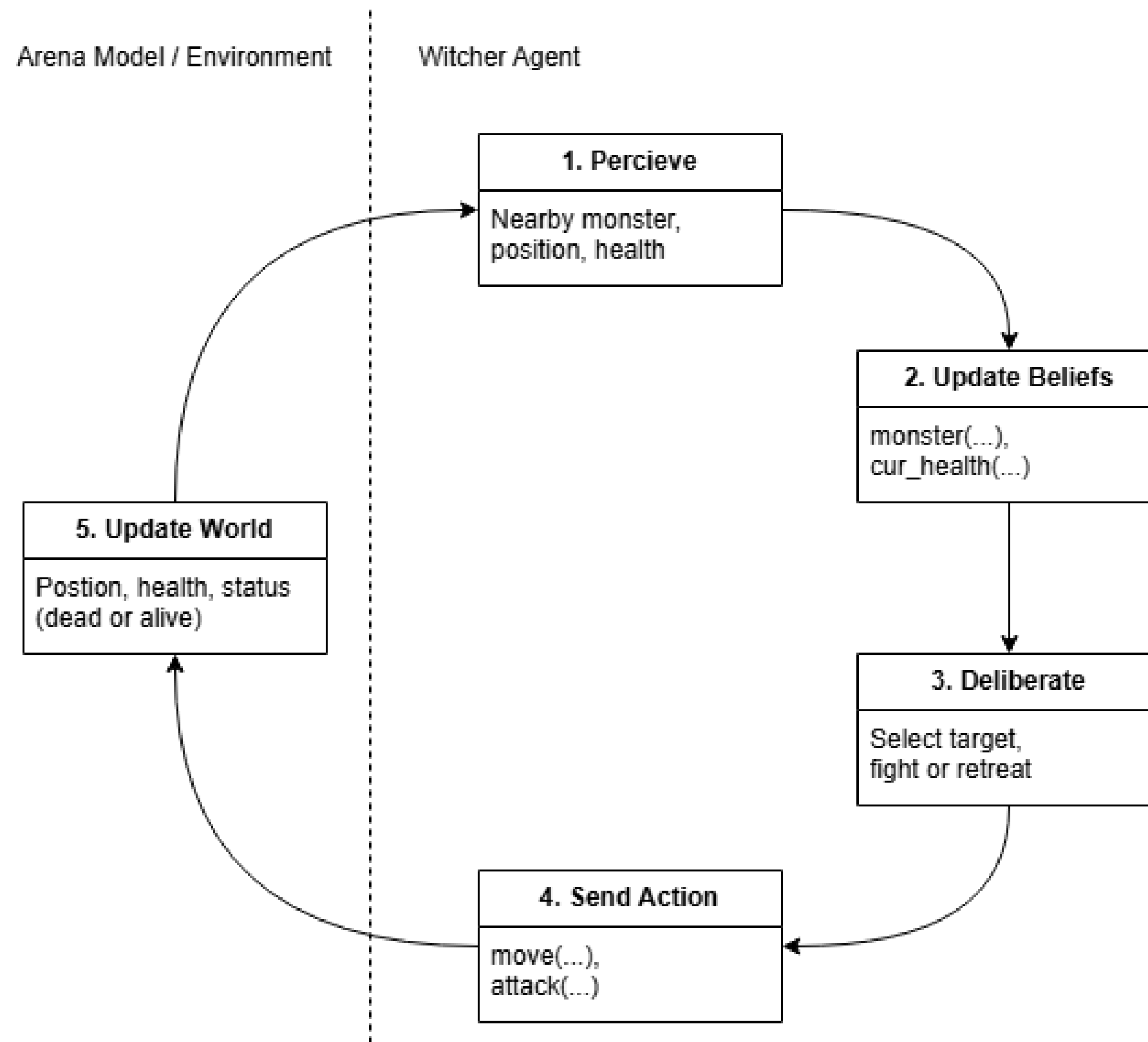


Design

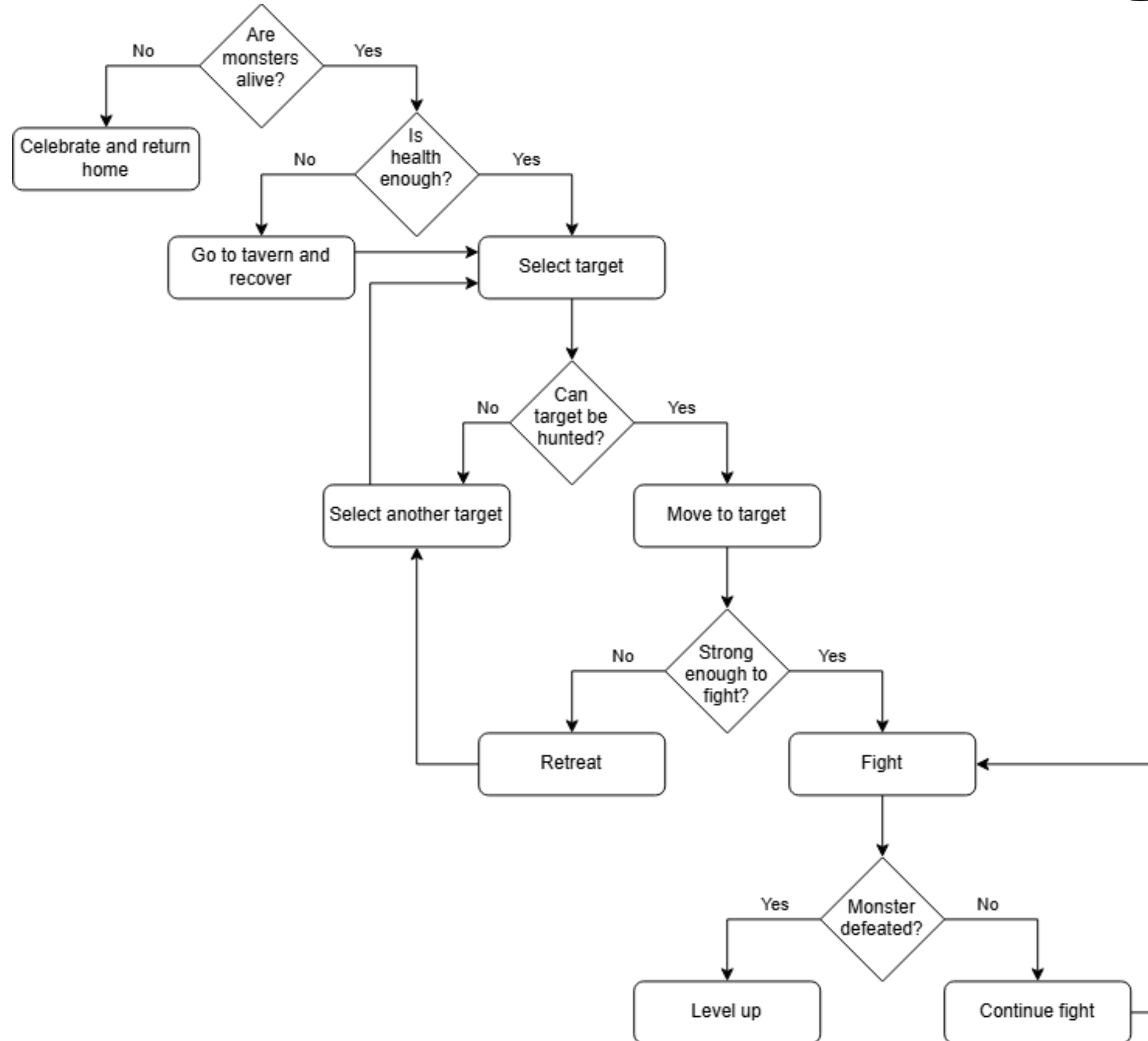
Design Overview



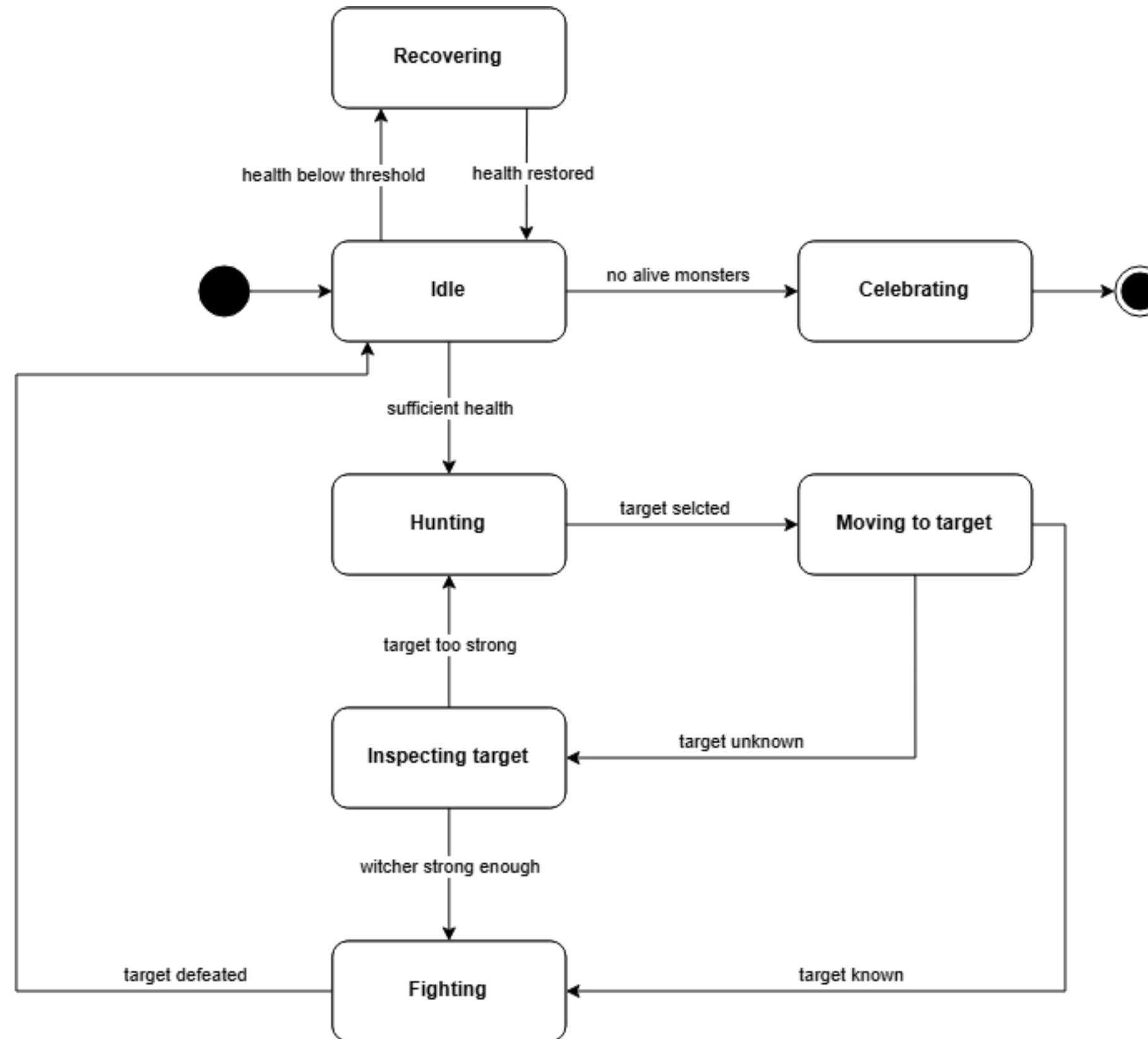
Perception-Action Cycle



Witcher Decision Logic



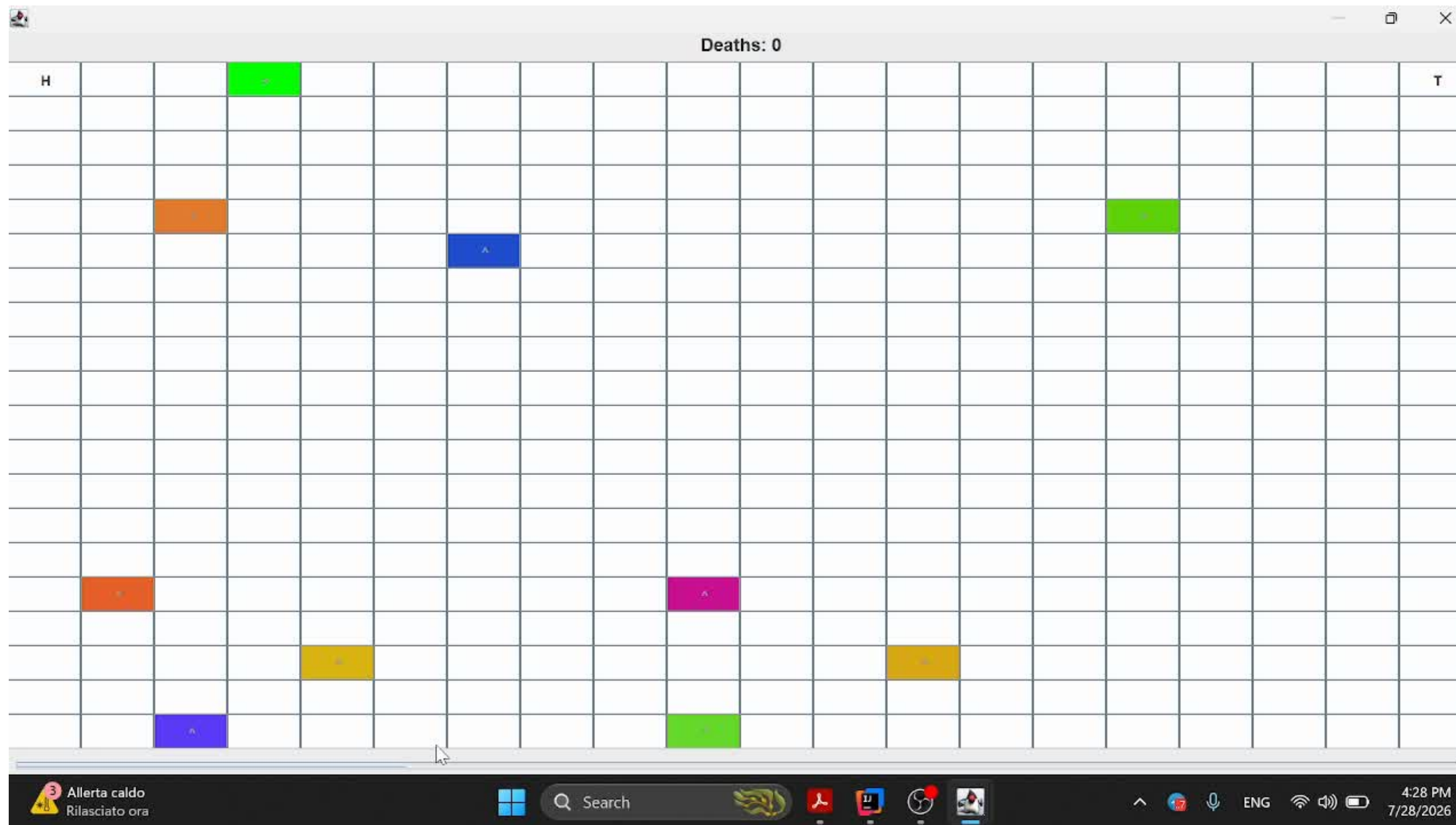
Witcher Behavior States



Corner Cases and Limitations

- Invalid actions are ignored by the environment
- Dead monsters are removed from target selection and visualization
- No progression path when all remaining monsters are stronger

Implementation

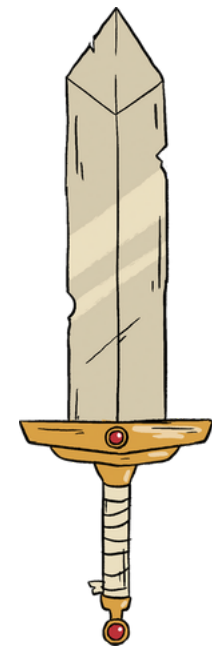


Observability

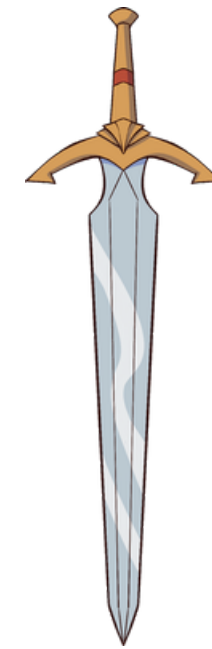
The screenshot displays a Multi-Agent System (MAS) simulation interface. On the left, a grid world is shown with a 20x20 layout. The top of the grid is labeled "Deaths: 0". Several cells are highlighted with different colors: a green cell at (1,1), a blue cell at (7,7), a red cell at (10,10), a magenta cell at (1,10), a cyan cell at (10,14), an orange cell at (14,14), a blue cell at (7,17), a yellow cell at (18,17), and a cluster of orange and yellow cells at (14,19) and (15,19). On the right, a console window titled "MAS Console - project" displays the following log:

```
Runtime Services (RTS) is running at 192.168.1.11:59617
Agent mind inspector is running at http://192.168.1.11:3272
[witcher] Contract available: fiend at (15,18)
[witcher] Contract available: griffon at (14,11)
[witcher] Contract available: siren at (7,13)
[witcher] Contract available: werewolf at (14,18)
[witcher] Contract available: vampire at (12,7)
[witcher] Contract available: drowner at (12,2)
[witcher] Contract available: leshen at (8,1)
[witcher] Contract available: wraith at (18,14)
[witcher] Contract available: troll at (0,5)
[witcher] My next target is troll!
[witcher] Tracking monster at: (0, 5)
```

At the bottom of the console window, there are buttons for "Clean", "Stop", "Pause", "Debug", "New agent", and "Kill agent". The Windows taskbar at the very bottom shows the system clock as 4:30 PM on 7/28/2026, along with various system icons and the search bar.



Conclusion



Future Work

- Randomization in combats
- Moving monsters
- Alternative progression
- Stricter brain/body separation
- Becoming a full fledged video game with intelligent agents

Lessons Learned

- Applied software engineering principles to agent-oriented programming and the BDI paradigm.
- Gained practical experience with Jason and how autonomous agents perceive, reason, and make decisions.
- Learned the importance of separating agent reasoning from game logic, resulting in a modular and maintainable architecture.
- Demonstrated how BDI agents can create more adaptive and intelligent NPC behavior than traditional scripted approaches.
- Recognized the potential for extending this simulation into a full-scale game or other intelligent multi-agent applications.

Thank you

