

## Snapshot Week 8 of Group COMPLEX 8

# Defence Science and Technology Group (DSTG) and Swordfish Computing Project Proposal: Distributed Decision-Making



THE UNIVERSITY  
*of* ADELAIDE

a1734056	Hayden Lee
a1734069	Vinh Nguyen
a1743599	Nathan Van der Hoek
a1744852	Harry Bagley
a1746088	Daniel O'Connor
a1746146	Patrick Capaldo
a1748751	Sarah Damin
a1749935	Sam Davies
a1773841	Hayley Richardson

## 1. Product Backlog and Task Board

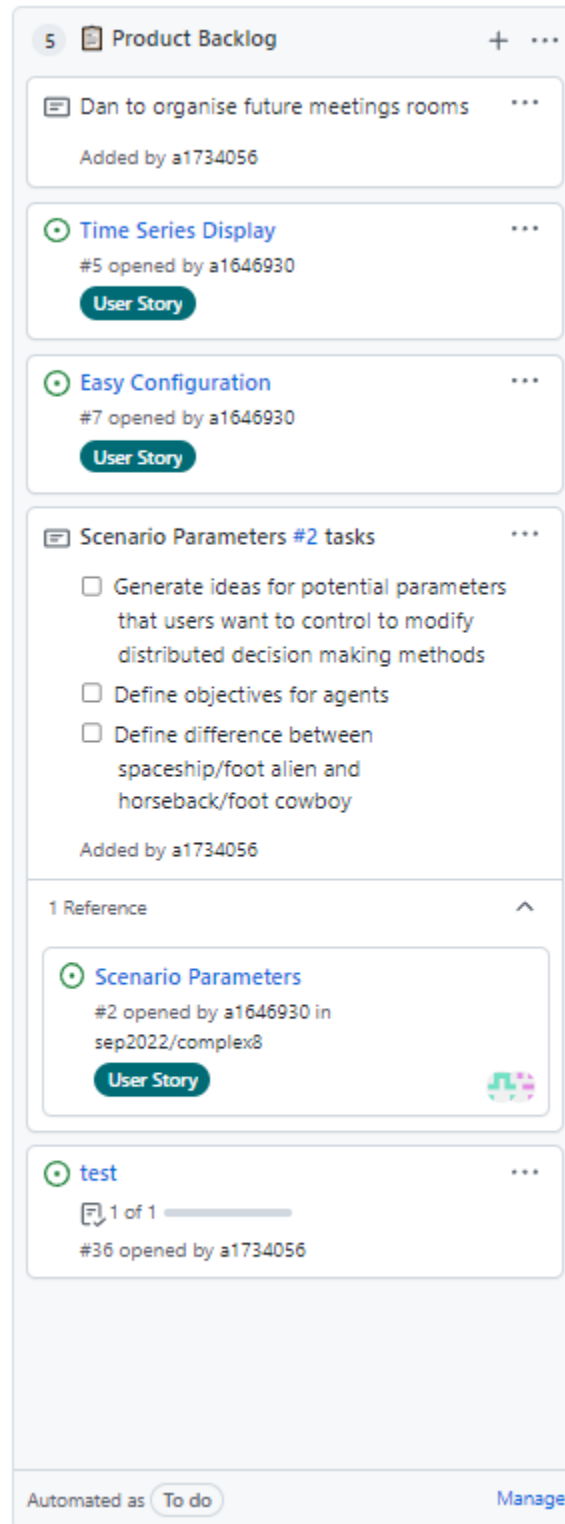


Figure 1: Product Backlog Screenshot

Product Backlog

Updated 6 hours ago

5

Product Backlog

+ ...

☑ Dan to organise future meetings rooms

Added by a1734056

🕒 Time Series Display

#5 opened by a1646930

User Story

🕒 Easy Configuration

#7 opened by a1646930

User Story

☑ Scenario Parameters #2 tasks

Generate ideas for potential parameters that users want to control to modify distributed decision making methods

Define objectives for agents

Define difference between spaceship/foot alien and horseback/foot cowboy

Added by a1734056

1 Reference

☑ Scenario Parameters

#2 opened by a1646930 in sep2022/complex8

User Story

🕒 test

0 of 1

#36 opened by a1734056

Automated as To do

Manage

9

Sprint Backlog

+ ...

☑ Configuration Profiles #3 Functional Reqs

The UI shall generate config file after scenario parameters have been selected

The UI generated config file shall be compatible with the backend simulation logic

The UI shall allow the user to import a previously generated config file to load a scenario for adjustment

Added by a1748751

1 Reference

🕒 Configuration Profiles

#3 opened by a1646930 in sep2022/complex8

User Story

☑ Algorithms and Choices #1 Functional Reqs

The UI shall enable the user to select distributed algorithms to test

Cowboys shall exhibit different behaviour dependent on the DDM algorithm employed

Cowboys shall be able to communicate with other cowboys

Cowboys shall detect other agents in their vicinity

Cowboys shall be able to shoot and have ammo (i.e. total number of shots available)

Added by a1748751

1 Reference

Automated as In progress

Manage

4

In Progress

+ ...

🕒 Complete MASON tutorials tutorialand2 and Students

#37 opened by a1743599

🕒 Implement MVP scenario in MASON simulation framework

0 of 3

#30 opened by a1734069

☑ Frontend UI #3 tasks

Click here for generated JSON config files

File -> import config file functionality

Modularise code to facilitate extensibility

Documentation

Comments

Dan and Hayden to combine UI functionalities

Added by a1734056

1 Reference

🕒 Configuration Profiles

#3 opened by a1646930 in sep2022/complex8

User Story

🕒 Determine how MASON collects statistics/metrics and exports/stores them

0 of 3

#31 opened by a1734069

Automated as In progress

Manage

3

Review

+ ...

🕒 MVP Coordinator class

#39 opened by a1743599

1 linked pull request

🕒 Develop new architecture that includes the MASON framework.

#38 opened by a1743599

🕒 #1 Find implementations of algorithms or begin implementing from scratch.

3 of 3

#29 opened by a1734069

Automated as In progress

Manage

30

Done

+ ...

☑ Requirements Definition and Documentation

Front end

Config File

Cowboy/Agent Behaviour

Back end

Added by a1748751

🕒 Provide/aggregate resources for MASON

#33 opened by a1743599

🕒 Algorithm selection

4 of 4

#22 opened by a1743599

☑ Create directory/repo structure for MASON-based backend

#34 opened by a1743599

1 linked pull request

☑ Software env/language #8 Tasks

Individually look into AnyLogic simulation modeling tool

PC to write/link to helpful resources for AnyLogic/JavaSwing

(everyone) JavaSinging tutorials and guides

Added by a1734056

1 Reference

☑ Decide software environment/language

#8 opened by a1734056 in sep2022/complex8

question

Automated as Done

Manage

Figure 2: Task Board Screenshot

## 2. Sprint Backlog and User Stories:

9 Sprint Backlog

Configuration Profiles #3 Functional Reqs

☐ The UI shall generate config file after scenario parameters have been selected

☐ The UI generated config file shall be compatible with the backend simulation logic

☐ The UI shall allow the user to import a previously generated config file to load a scenario for adjustment

Added by a1748751

1 Reference

Configuration Profiles

#3 opened by a1646930 in sep2022/complex8

User Story

Algorithms and Choices #1 Functional Reqs

☐ The UI shall enable the user to select distributed algorithms to test

☐ Cowboys shall exhibit different behaviour dependent on the DDM algorithm employed

☐ Cowboys shall be able to communicate with other cowboys

☐ Cowboys shall detect other agents in their vicinity

☐ Cowboys shall be able to shoot and have ammo (i.e. total number of shots available)

Added by a1748751

1 Reference

9 Sprint Backlog

Scenario Parameter #2 Functional Reqs

☒ The UI shall enable the user to add agents at specified XY positions

☒ The UI shall enable the user to modify agent parameters

☐ Agents shall have several properties e.g. HP, speed, Line of sight range, shooting range, shooting damage, communication range

☐ Agents shall exhibit different behaviour depending on the agent properties

☐ Agent properties shall be changed through the UI

☐ Agents shall not change behaviour depending on the information they should not know about

Added by a1748751

1 Reference

Scenario Parameters

#2 opened by a1646930 in sep2022/complex8

User Story

Actually implement DDM algos

0 of 2

#32 opened by a1734069

Scenario Parameters

#2 opened by a1646930

User Story

Configuration Profiles

#3 opened by a1646930

User Story

Automated as In progress Manage

Algorithms and Choices ...

#1 opened by a1646930

User Story



Results Export ...

#6 opened by a1646930

User Story

Extensible Algorithm Choices ...

#4 opened by a1646930

User Story

Automated as In progress

Manage

## In-progress items:

4

In Progress

•

[Complete MASON tutorials tutorial1and2 and Students](#)

...

#37 opened by a1743599

•

[Implement MVP scenario in MASON simulation framework](#)

...

0 of 3

#30 opened by a1734069

☰

Frontend UI #3 tasks

...

Click [here](#) for generated JSON config files

☐ File -> import config file functionality

☒ Modularise code to facilitate extensibility

☒ Documentation

☐ Comments

☐ Dan and Hayden to combine UI functionalities

Added by a1734056

1 Reference

^

•

[Configuration Profiles](#)

...

#3 opened by a1646930 in sep2022/complex8

User Story

•

[Determine how MASON collects statistics/metrics and exports/stores them](#)

...

0 of 3

#31 opened by a1734069

Automated as

In progress

Manage

Figure 3: Sprint 3 in-progress items

The current user stories for this sprint are (which have been first discussed in snapshot 7 the first week of the sprint):

1. Configuration Profiles
2. Scenario Parameters
3. Algorithm and Choices
4. Results Export
5. Extensible Algorithm Choices

Their description is as follows:

The 'Configuration Profiles', 'Scenario Parameters', and 'Algorithm and Choices' relate to how the designed software will be able to store configuration settings, change parameters of the scenario, and store these configurations settings respectively.

The 'Results Export' user story is focused on how MASON can export results and metrics.

Extensible Algorithm Choices relates to the tasks of finding implementations of DDM algorithms already produced, and investigating how these may be interfaced with MASON.

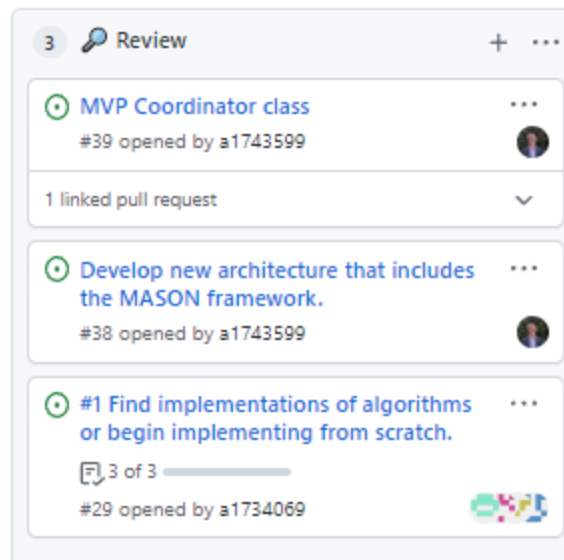
**There has been no additional user stories added mid-sprint.**

### 3. Definition of Done:

- Code written and commented
- Documentation written and updated
- Code peer-reviewed
- Documentation peer-reviewed
- Code architecture conforms to specified design pattern.
- Tests written and passing
- Non-functional requirements met (UX, performance, availability)
- Acceptance criteria fulfilled

### 4. Summary of Changes:

Since the last team snapshot, these items on the sprint backlog were completed:

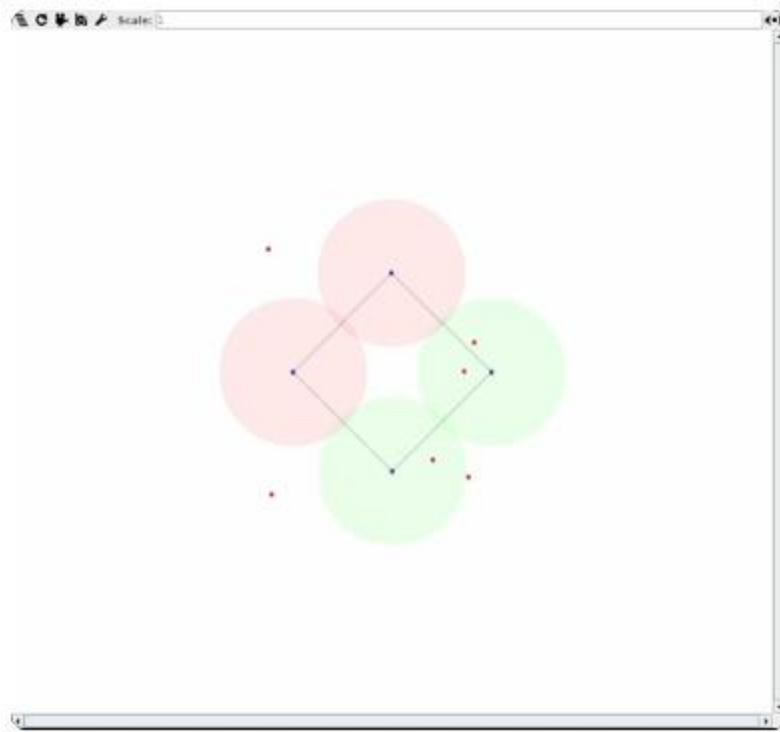


These items will be moved to 'Done' during the sprint review meeting.

Building on last snapshot's issue #33 about aggregating training/useful tutorials for MASON for the team to use to develop their skills, more guidance and documentation has been provided by Nathan and Vinh in the word document "MASON Setup Guides". This document will outline the individual steps required to set up the development environment for MASON, and the packages and steps required to solve the MASON tutorials. As a result, MASON tutorials 1 and 2, and the student tutorial in the MASON user textbook are to be completed by the team.

With these tutorials complete, development on the actual software backend using MASON can be conducted. This can be seen in issue #39 and #38, where the software architecture and MVP coordinator class has been implemented using MASON. This involved, creating the cowboy and alien agents, and introducing MVP agent behaviour such as agent movement, agent placement, and agent detection as shown below:





*Figure 4: MASON software demonstrating agent behaviour of cowboys with detection circles, and aliens moving towards the centre*

Although this MASON architecture does not demonstrate DDM algorithm behaviour yet, issue #29 is currently in review and will help in overall project goals, as this issue relates to finding implementations of DDM algorithms or to begin implementing the algorithms from scratch. This issue includes the documentation of potential DDM algorithms have already been implemented and their pros/cons, and also documenting which algorithms are better made from scratch.

The Front-end UI is still currently in progress, as Hayden and Dan combine their UI features into a cohesive front-end design.