

Research Log:

A weekly research log, where each week's report contains:

An hour log showing how much time I spent working that week.

A brief description of what I accomplished that week.

A brief description of any unexpected changes I discovered that week.

A brief description of how the accomplishments and changes impacted my plan going forward.

Date	Time spent	brief description of what I accomplished	brief description of any unexpected changes I discovered	brief description of how the accomplishments and changes impact my plan going forward
1/8	2.5 hours	-Research on how to make a new mob in Minecraft. -Planning for how to implement AGI agent as a mob in Minecraft.	-I need to make a mob with an inventory (hasn't been done yet).	-I will experiment with Player class functionality to see if I can make a mob with an inventory.
1/10	2.5 hours	-Research on case-based reasoning. -Planning inputs, outputs, rewards, and overall structure for AGI agent.	-Case-based reasoning may allow for more human-like learning.	-I will do more research to see if case-based reasoning can be mixed with reinforcement learning to create human-like learning.
1/11	2.5 hours	-Research on CBR, DRL, and customizations to DRL to make it learn+act more like humans. -Updated neural net model plan.	-Installing Minecraft is impossible until Windows update error is patched. -CBR is not useful (for the first deliverable). -Discovered adaptive learning rates, multi-step returns, and neuroevolution. -The first deliverable should be basic and not include neuroevolution or adaptive max reward/punishment level.	-I will wait until the Windows issue is patched before beginning the modding process, and will work on the plan for the first deliverable in the meantime. -I will further update the neural net model plan for the first deliverable and focus on making that plan into a deliverable before adding advanced pieces.
1/12	2.5 hours	-Planned out first agent iteration/deliverable. -StoryLab meeting.	-Graphical interface for mob is not viable. -Certain mob functionality is too complicated for first iteration.	-I will use the updated first-iteration plan to make the agent once the modding process becomes available.
1/16	2.5 hours	-Installed Minecraft. -Built testing cubicles in an empty world.	-Agent will need crafting and block-interaction abilities.	-I will add crafting spaces to world model and output actions for accessing and interacting with them.
1/17	2.5 hours	-Installed+setup Minecraft modding software. -StoryLab meeting.	-I might not need the vanilla Minecraft I installed earlier. -I might want to use non-DNN-based reinforcement learning.	-I will conduct more research on DNN/non-DNN -based reinforcement learning to see which is better for this project.
1/18	2.5 hours.	-Started making no-brain mob for agent. -1-on-1 meeting.	-I have to make a mob body from scratch. -M.D. reminded me of Black&White.	-I will need some extra time to make agent's mob body. -I will do research on B&W to see if their NPC AI uses some useful techniques that can be applied to agent.
1/19	2.5 hours.	-Continued making no-brain mob for agent.	-I might be able to use the Player class to implement the agent mob, which would be easier (already has right stats, inventory, etc.) and also harder (no tutorials on how to do so).	-I will attempt to use the Player class to implement the agent mob. If unable, I will use traditional methods and then improve the implementation from there.
1/22	2.5 hours.	-Finished making no-brain mob for agent.	-I can use Mob classes instead of the player classes because some mobs already have the functionality I need (inventory, etc.).	-I will use the Mob class(es) to implement the agent mob instead of trying to use the Player class, which should hopefully save time and energy.
1/23	2.5 hours.	-Finished basic inventory for agent.	-N/A.	-N/A.
1/24	2.5 hours.	-Worked on animations for agent.	-Getting animations working is taking longer than expected.	-I will do more research on getting animations set up properly for a humanoid mob.
1/25	2.5 hours.	-1-on-1 meeting.	-N/A.	-N/A.
1/26	2.5 hours.	-Completed all animations for agent except for items being held in main hand (I think).	-I had to remake the agent's model so the animations could be applied correctly.	-I will have to extend the basic-mob-creation time period from 2 to 3 weeks. Less AI work will be accomplished.
1/29	2.5 hours.	-Tried to get item in main hand to show up.	-Getting this to work is taking longer than expected (as expected).	-Hopefully 1/26's suffices and I don't have to extend to 4 weeks and thereby get even less done.
1/30	3 hours.	-Tried to get items and armor to show up.	-The rendering is what's not working, not the armor and handheld item functionality.	-I will work on getting the rendering to work correctly.
1/31	2.5 hours.	-Finished fixing rendering for agent mob.	-N/A.	-N/A.
2/1	1 hours.	-Started working on outputs/actions.	-N/A.	-N/A.
2/2	3.5 hours.	-Continued working on actions (movement).	-Finding the best/correct way to utilize built-in functionality for simple movements is far more difficult than I imagined. There seems to be no easy way to make the agent strafe or look around, at least not without negating proper functionality (walking slower in lava, etc.).	-Building the outputs/actions will take longer than expected. This will delay work on the DRL piece of the project. Building the inputs/world_model might also take longer, which would delay the DRL piece even further.
2/5	2.5 hours.	-Continued working on actions (movement).	-Same issues.	-I'll try building in Player class movement functionality.
2/6	2.5 hours. 50 total.	-Continued working on actions (movement).	-Same issues. Player classes don't help.	-Same as 2/2.
2/7	2.5 hours.	-Continued working on actions (movement): --Fixed rotation-reset-on-movement bug!	-N/A.	-I will now find the proper functions to call, based on the info I got from fixing the bug.
2/8	2.5 hours.	-Continued working on actions (movement): --Finished rotations (AFAIK). --Started on walking/strafing.	-Walking functionality seems easier to access.	-I should be able to finish up movements quicker than expected, and thereafter work on hand actions.
2/12	2.5 hours.	-Continued working on actions (movement): --Finished walking/strafing (AFAIK).	-N/A.	-N/A.

2/13	2.5 hours.	-Continued working on actions (jumping): --Changes are being made to walking.	-Yesterday's walking setup blocks jumping.	-I will change the walking functionality to not block jumping. This will add time but hopefully make actions less buggy.
2/14	2.5 hours.	-Continued working on actions: --Finished movement actions (AFAIK).	-Looking is slower when walking. Not a need-to-solve issue?	-I will now work on hand actions, and then inventory actions.
2/15	2.5 hours.	-Started working on inputs (vision): --Finished block-detecting vision (AFAIK).	-Seeing blocks is different than seeing mobs.	-I will need to spend more time figuring out how to see blocks+entities+items, not just blocks.
2/16	2.5 hours.	-Continued working on inputs: --Finished vision (AFAIK).	-N/A.	-N/A.
2/19	3 hours.	-Finished inputs (AFAIK): --Finished hearing (AFAIK). -Started working on hand actions.	-Hand actions seem more complex because no mobs build/break blocks.	-I will have to put in more time incorporating build/break actions by copying Player class functionality, will push back work on learning algorithm.
2/21	2.5 hours.	-Started re-coding agent to be a modified LocalPlayer class (descend. of Player class).	-Building/Breaking is only available via Player classes. I will have to remodel.	-I will have to re-code Agent to descend from Player class. Will halt work on learning algorithm until I can correctly insert+edit+connect LocalPlayer class code.
2/22	2.5 hours.	-Continued re-coding agent to be a modified LocalPlayer class.	-N/A.	-N/A.
2/23	1.5 hours.	-Continued re-coding agent to be a modified LocalPlayer class.	-Taking longer than expected.	-More time needed.
2/28	3.5 hours.	-Continued re-coding agent to be a modified LocalPlayer class. --Presented current work in StoryLab meeting.	-Same as 2/23.	-Same as 2/23.
2/29	2.5 hours.	-Continued re-coding agent to be a modified LocalPlayer class.	-Same as 2/28.	-Same as 2/28.
3/4	1.5 hours.	-AGI and DRL research with C.M. and the other StoryLab boys.	-N/A.	-Working on the DRL research with C.M. will take up some time this week, so I won't get back to the agent until next week (most likely).
3/5	2.5 hours.	-DRL research (with C.M.).	-N/A.	-Same as 3/4.
3/6	2.5 hours.	-DRL research (with C.M.). -StoryLab meeting. -Continued re-coding agent to be a modified LocalPlayer class.	-N/A.	-Same as 3/5.
3/7	0.5 hours.	-1-on-1 meeting.	-N/A.	-N/A.
3/8	2 hours.	-Continued re-coding agent to be a modified LocalPlayer class.	-N/A.	-N/A.
3/11	1 hours.	-Researched human learning.	-N/A.	-N/A.
3/12	2.5 hours.	-Continued re-coding agent to be a modified AbstractClientPlayer class.	-N/A.	-N/A.
3/13	4 hours. 99.5 total.	-Finished attack hand action. -Presented on DRL with C.M. in StoryLab.	-Player class use is too time-intensive.	-Agent will have to use mob classes and have limited functionality (for the time being).
3/14	2.5 hours.	-Started break-block hand action.	-Coding break-block actions using mob classes is easier than expected.	-Agent will have full functionality if I can research over the summer, or limited functionality if I must finish in April.
3/15	2.5 hours.	-Finished attack+break hand actions. -Started working on use-item hand actions.	-N/A.	-N/A.
3/19	2.5 hours.	-Finished use+place hand actions and switch-inventory actions.	-I think the Agent is ready for DRL!	-I can start integrating the DRL algorithm now (afaik)!!!!
3/20	1.5 hours.	-Finished Agent mob body (afaik).	-N/A.	-I will now start making the DRL and connection.
3/21	2.5 hours.	-Learned about python setup and gRPC. -Started python setup: installed pytorch. -Set up meeting with C.M. for Monday.	-N/A.	-N/A.
3/25	2.5 hours.	-Set up coding environment with C.M..	-N/A.	-N/A.
3/26	1 hours.	-Struggled to set up Python DRL.	-Coding Python DRL is a lot harder to figure out than I thought.	-I will have to rely on help from C.M. until I understand enough to code Python DRL on my own. This might slow my progress by a bit.
3/27	2 hours.	-Coding Python DRL with C.M..	-The amount of coding I do for Python DRL might be less than I originally thought.	-Figuring stuff out and coding the Python DRL will hopefully take up a shorter amount of time.
3/28	2.5 hours.	-Coding DRL and gRPC.	-gRPC is currently tricky to figure out.	-Getting python and java to connect may take up more time than expected, may slow DRL progress.
3/29	2 hours.	-Coding gRPC.	-Same as yesterday.	-Same as yesterday.
4/2	2.5 hours.	-Coding gRPC.	-N/A.	-N/A.
4/3	2.5 hours.	-Stuck in same place as yesterday.	-Fixing this is taking far longer than expected.	-After classes end I'm going to do a month of full-time work on this project in order to get the Agent working.
4/4	2.5 hours.	-Might've finished java-side gRPC code.	-Found route to get out of rut I've been in for the past few days.	-I will have to verify completion next time. Hopefully it is complete and I can move onto the Python-side code.
4/8	2.5 hours.	-Coding gRPC.	-Python code isn't initializing correctly? -Java code says it's missing a class?	-This is taking way longer than expected and I probably won't get to the DRL stuff until the semester ends.
4/9	2.5 hours.	-Coding gRPC.	-Changed from python-server and java-client to python-client and java-server via example.	-The found example and java/python gRPC tutorials should hopefully speed up the gRPC coding time.
4/10	2.5 hours.	-Coding gRPC.	-N/A.	-N/A.

4/11	2.5 hours.	-Coding gRPC.	-Unexplained process-drop when spawning the Agent in the game.	-Finding a fix for this bug will take more time and delay DRL work for a bit longer.
4/12	1.5 hours.	-Coding gRPC.	-Unexplained dependency absence.	-Finding a fix for this bug will take more time and delay DRL work for a bit longer.
4/15	2.5 hours.	-Worked on making DRL structure for presentation on Thursday.	-Figuring out how I want this to work is more complicated than I thought.	-I probably won't finish connecting the Java to the Python until after classes end.
4/16	2.5 hours.	-Coding gRPC.	-Same bug as 4/12.	-Same as 4/12.
4/17	2.5 hours.	-Worked on making DRL structure for presentation on Thursday.	-Same as 4/15.	-Same as 4/15.
4/18	2.5 hours.	-Finished presentation for today.	-N/A.	-N/A.
	150 total.			
4/29	7 hours.	-Started setting up file-based communication between java and python halves.	-It's a lot easier to get this figured out.	-I should hopefully have the connection finished by the end of tomorrow.
4/30	7.5 hours.	-Finished setting up file-based communication between java and python halves.	-Got stuck on undead block bug.	-Fixing the undead block bug will take up time and delay work on the DRL stuff.
5/1	4.5 hours.	-Fixed undead block bug.	-N/A.	-N/A.
5/2	4 hours.	-Added in inventory senses and pass-from-body-to-brain functionality. -Created Python-side world model (aside from coordinate shift so spawn is at 0,0,0).	-N/A.	
5/3	4 hours.	-Implemented coordinate shift. -Continued implementing Python functions. -Started reworking actions for DRL capability.	-DRL tools currently only allow for one output to be returned, not several.	-I will have to spend some extra time reworking the actions so they use the only-one-output functionality of the DRL tools I'm using.
5/4	4 hours.	-Continued implementing Python functions. -Met with C.M. to get help with Python. -Read andyJones.com/posts/r-debugging.	-Getting the Agent running correctly will take a lot more testing and iterating than I assumed.	-I probably won't finish the Agent by the end of May.
5/6	5 hours.	-Started figuring out model crafting. -Started building model.	-This is a lot of new stuff that I have to learn from scratch.	-Building the model will be very time-intensive.
5/7	6.5 hours.	-Continued figuring out model crafting. -Continued building model.	-Same as yesterday.	-Same as yesterday.
5/8	7 hours.	-Continued figuring out model crafting. -Continued building model while fixing bugs.	-N/A.	-N/A.
5/9	4.5 hours.	-Continued figuring out model crafting. -Continued building model while fixing bugs.	-I've run into a randomly occurring batch_size/channel_count swap bug that I can't seem to fix on my own. -C.M. was unavailable for a significant part of today and will be unavailable until Monday.	-Work on the Agent will be stalled tomorrow and Saturday unless I find a way to fix complicated DRL bugs (specifically the swap bug) without C.M. help. -I can work on a simple project until C.M. gets back if I'm unable to find a solution without his help.
5/10	5.5 hours.	-Continued figuring out model crafting. -Continued building model while fixing bugs. -Started training Agent with small environment.	-Fixed bug from yesterday via M.D. -No other bugs appeared for training (saving and testing model is bugged).	-I will now focus on fixing saving+testing bugs, and then focus on training+iterating the agent via a small environment.
5/11	4 hours.	-Refined environment classes. -Fixed bugs in environment classes.	-N/A.	-N/A.
5/13	6 hours.	-Fixed hostile mobs not attacking the Agent. -Organized Python classes.	-Fixing hostile mobs not attacking the agent took longer than expected.	-DRL work has been stalled slightly.
5/14	6 hours.	-Continued figuring out model crafting. -Started iterating model. -Started implementing HER.	-N/A.	-N/A.
5/17	3.5 hours.	-Continued iterating and testing model.	-N/A.	-N/A.
5/18	6 hours.	-Continued iterating and testing model.	-N/A.	-N/A.
5/21	7 hours.	-Fixed an env bug that prevented learning. -Trained the model and saw learning happen. -Added in senses for spatial awareness.	-N/A.	-N/A.
5/22	6 hours.	-Fine-tuned spatial sense info. -Increased world size slightly. -Enlarged feat_extractor+net_arch.	-N/A.	-N/A.
5/23	6 hours.	-Attempted to rig HerReplyBuffer. -Continued iterating and training the model.	-HerReplyBuffer has no good setup guides. -Model is now too big, must use GPU to run.	-Installing and rigging CUDA will take time and prevent some iterating+training+testing.
5/24	7 hours.	-Installed PyTorch Cuda to run model on GPU. -Continued iterating and training the model.	-N/A.	-N/A.
5/25	3 hours.	-Started implementing HerReplyBuffer.	-N/A.	-N/A.
5/27	8 hours.	-Continued implementing HerReplyBuffer.	-N/A.	-N/A.
5/28	3 hours.	-Finished implementing HerReplyBuffer (as far as I can tell).	-N/A.	-N/A.
	275 total.			
6/12	16 hours.	-Trained the model for 16 hours.	-Improvements were minimal.	-If I come back to this, I'll have to make a lot of improvements to the Agent and its training.