ID2209 Distributed Artificial Intelligence and Intelligent Agents

Final project – Behavior of different agents

Important dates

- Send us your project proposal (if any) **2019.11.27**

- Turn in your final project **2019.12.19**

- Presentation **2020.01.13**

Project topic – Festival personalities

- We are interested in seeing behaviour and interactions between different types of festival guests

- Some people come to festival to P A R T Y

- Some just want to „chill"

- Some are journalists

- Others just bought tickets cause they had nothing else to do..

- **What** happens when such people meet?

- Furthermore…

- **Where** they meet can also affect their interactions
- If a P A R T Y person and „chill" person meet at a bar, the chill person might get annoyed because the P A R T Y person is making a lot of noise
- But if they meet at a concert where a mutual favourite band is playing, they might just get along.

- Finally…

- **How** each persons' attributes may matter even though they have come to P A R T Y or „chill".

- At the bar, a P A R T Y person might (if generous = 0.9) buy the „chill" person a drink.

- If that „chill" person is ok with having one or two drinks, he might just accept it!

Don't limit yourself to P A R T Y and „chill"

- Other examples are rock fan, disco dancer, pop queen…
- Rock does not like pop, but is ok with disco ?

Or

- At a food festival, a meat eater meets a vegan person…

You get the idea. Be creative :)

To pass the final project (minimal requirements)

- Create <u>at least 5 </u>different types of agents. Use <u>at least 50</u> agents in your scenario.
- The agents have <u>at least 1 </u>different set of rules on how they interact with other types.
- They also have at <u>least 3</u> personal traits that affect these rules.
- Have <u>at least 2</u> different types of places where agents can meet (roaming not included)
- Make the simulation continously running.
- Agent communicate with FIPA for long distance messaging.

- Feel free to use any of the former assignments as a base (Store, Auction, Stage). If not, create some sort of event that might set the stage…

To pass, continued

- GAMA offers extra view to monitor variables or changes to global values.

- Have <u>at least 1</u> interesting value to monitor and display on a chart

- From this data, display <u>at least 1</u> useful and informative graph

- Draw out <u>at least 1</u> interesting conclusion from the created simulation

- Example: All agents have some sort of happiness value, ranging from bad (0) to good (1). Show that by adding/removing/changing behaviour of agents how happiness changes over time, to better or worse!
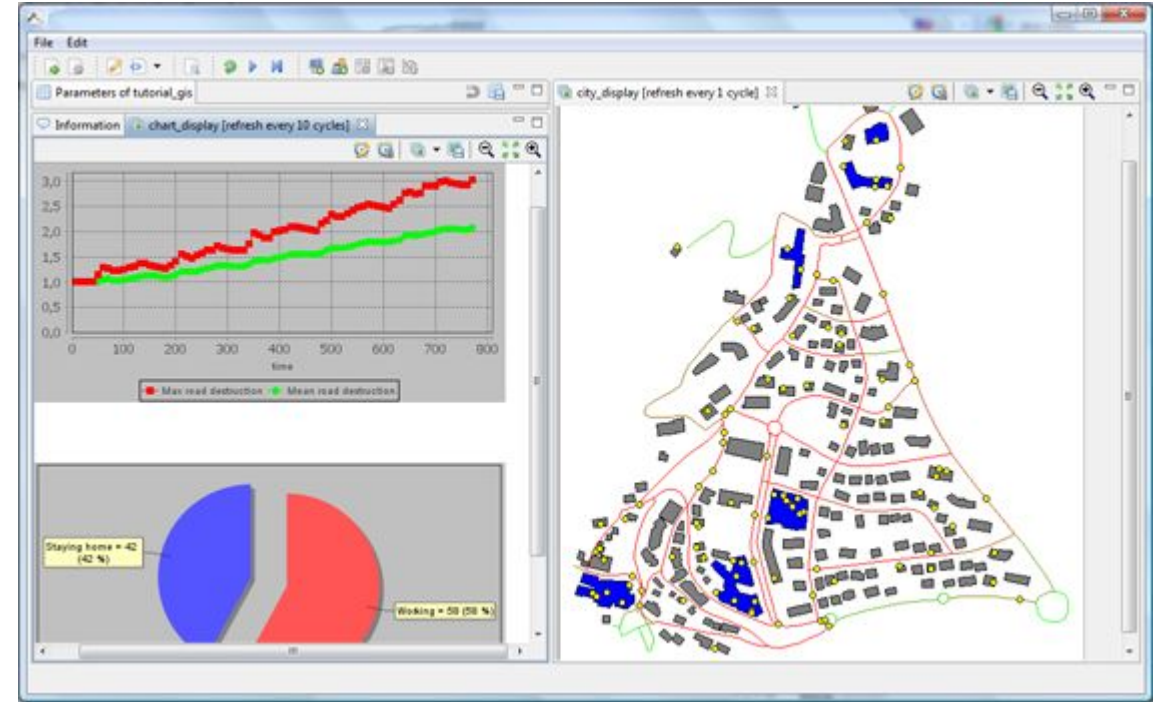
Platforms

- Platforms dedicated to Multi agent systems
  - GAMA
  - JADE or [something else](#)

- Game specific environment
  - Unreal Engine
  - Unity

- Other interesting platforms
  - Framsticks (evolve mechanics)
  - Gym.OpenAi
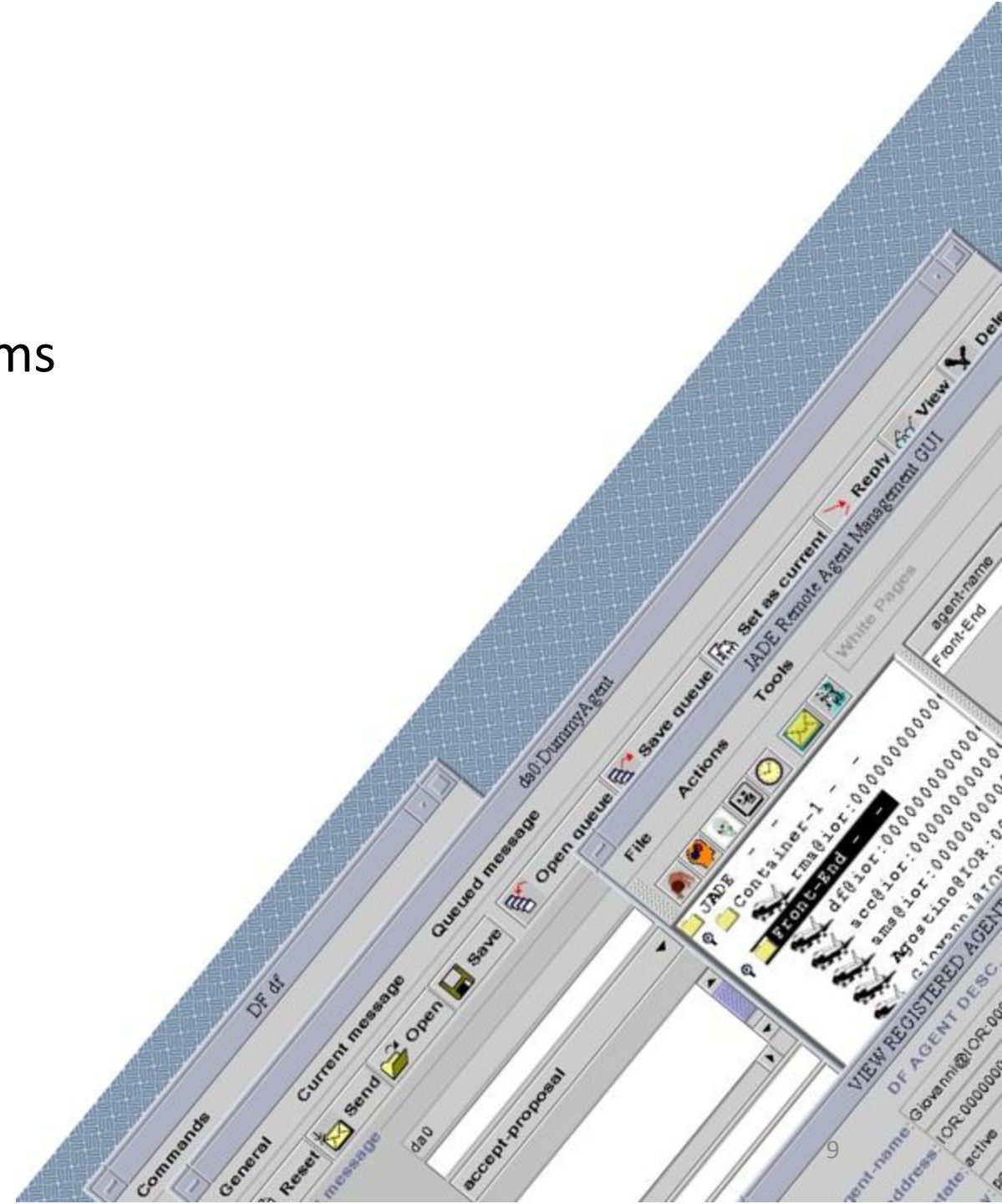
Project proposal

- Applies **ONLY** to groups that are not using GAMA or groups that are going to do a **DIFFERENT** project.

- Send in a project proposal (1 or 2 pages max).
- Include which platform you plan to use, project idea, goals for the project and which challenge (if any) you plan on taking.

- Be sure to deliver your project report and solutions by 2019.12.19

Project

- When turning in your project, please make sure that the code is documented well enough so we can skim over if needed.

- Include a readme.txt file that explains how to run the project.

- Upload the whole project in a .zip file to Canvas.

Project Report

- Submit a detailed report of your project

- Maximum of 20 pages

- Include subchapters
  - Introduction,
  - Approach,
  - Experiments & results,
  - Discussions and Conclusion

Deliverables

- Demonstration will be held 2020.01.13
- Be prepared for a 20 minute presentation, make sure you have a working solution.
- The presentation should be split by group members equally.

- Delivery on time = +2 bonus points

ARE YOU UP FOR THE CHALLENGE?

Difficult level

Hard | Belief – Desire – Intentions   (2 bonus points)

Really hard | Reinforcement learning   (3 bonus points)

Pick the difficulty level you prefer
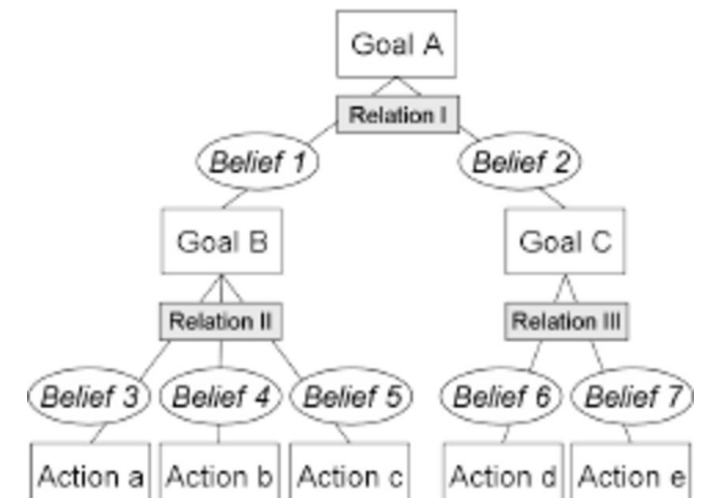
Hard
Belief – Desire – Intentions   (2 bonus points)

- From lectures, you should know what BDI is

- Some extra references to read about BDI:

- [About BDI agents in GAMA](#)

- [Using BDI in GAMA](#)

Requirements for passing this challenge is to clearly demonstrate (in your presentation and paper)
BDI behaviour in agents.

Afterwards, the code will be verified.

Really hard
Reinforcement learning (3 bonus points)

- It would be really interesting to let agents learn and improve over time. Avoiding other types of agents if they've had bad experience with them before, buying or not buying food from a bar based on past/heard experience…

- [Introduction article](#) to reinforcement learning

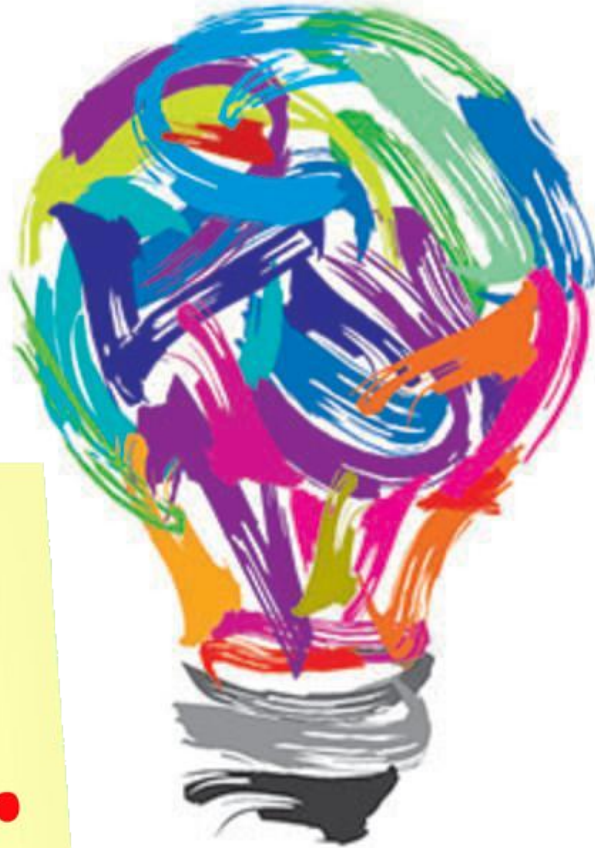- More [in-depth information](#) with links to papers
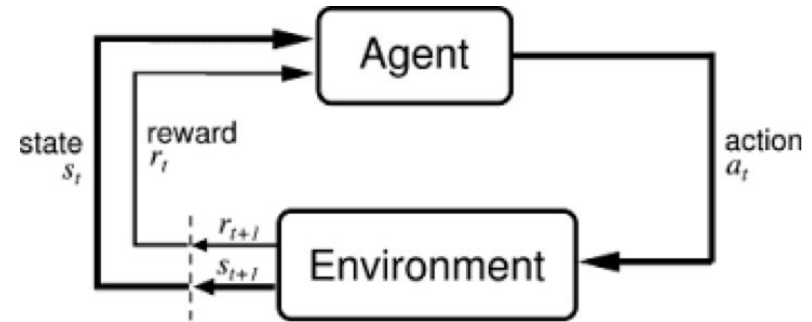
- There are no examples of this in GAMA (in fact, I don't even know how)
So if you can't find any proper way of doing this, explore other platforms.

- Note – Do **not** try this unless you have some experience/really committed.

Requirements for passing this challenge is to clearly demonstrate (in your presentation and paper) improvement in agents behaviour.

Afterwards, the code will be verified.

Creative idea □ +1 bonus point

Questions?