OPERAČNÍ PROGRAM PRAHA ADAPTABILITA

EVROPSKÝ SOCIÁLNÍ FOND

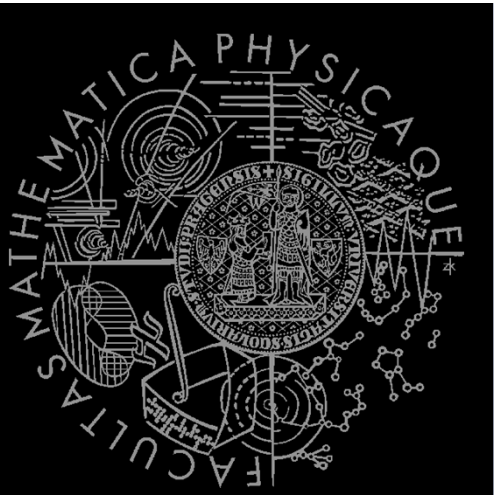
EVROPSKÁ UNIE

Pogamut 3
Lekce 11 - Závěr

PRAHA & EU

INVESTUJEME DO VAŠÍ BUDOUCNOSTI

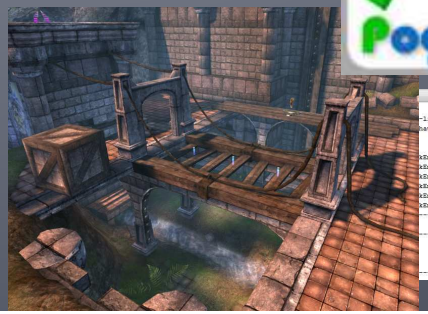
Faculty of mathematics and physics
Charles University at Prague
9th May 2013

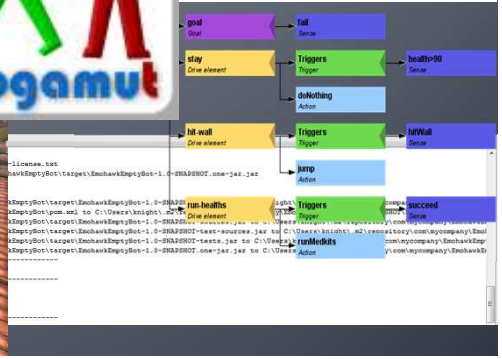


UT2004 & UE2 bots made easy!

Pogamut 3

Lecture 11 – Conclusion





Warm up!

Fill the test for this lecture!

http://alturl.com/i4i8a

Homework

CTF Bot

- Let's review homework from previous lecture!

Today's menu

1. **Tournament results**
   - **H&S, Deathmatch**
2. Recapitulation
   - What has been explained
3. Checklist for pretest / exam
   - What you should have learned
4. What's next?
   - Course schedule
5. CTF Bot Team
   - The bonus homework for those who have < 140 points

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Recapitulation I
General Topics

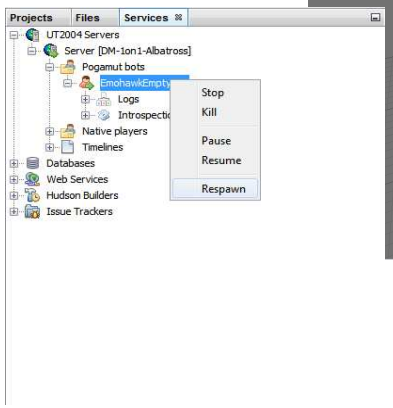
- What has been explained…
  - Basics of Java (ArrayList, HashMap, HashSet, Collections, chaining of setters…)
  - Basics of Pogamut
  - Basics of UT2004 (DeathMatch, CTF, Weapons)
  - Basic problems bots have to solve in 3D realtime environments
  - Basics of AI development
  - yaPOSH

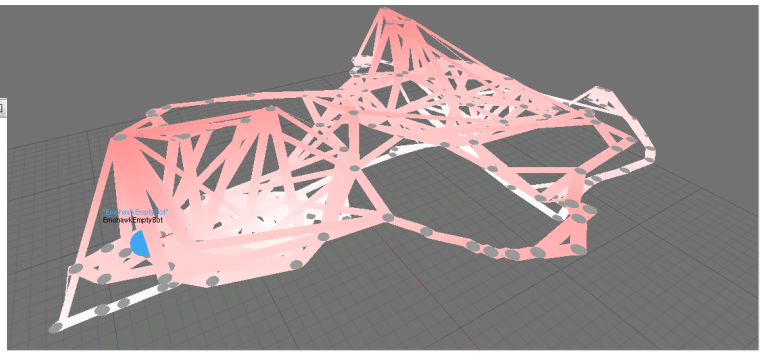
Recapitulation II
Pogamut modules

- You should remember Pogamut modules:
  - `navigation, pathExecutor, pathPlanner, fwMap`
  - `players`
  - `items`
  - `shoot`
  - `visibility, aStar`
  - `MyCollections, DistanceUtils`
  - `world, ctf`
  - listener annotations
    - `@EventListener(eventClass=TeamChat.class)`

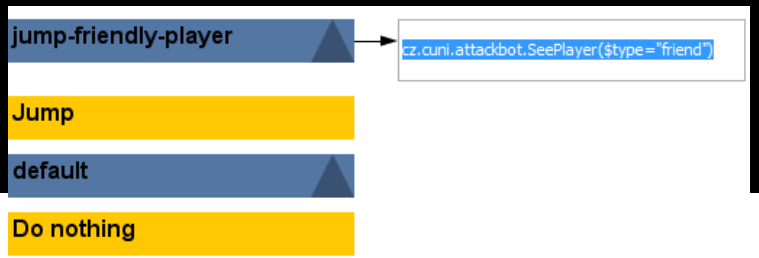
Recapitulation III
Coding and debugging

- You should know how to code the bot and how to debug the code in Pogamut effectively
  - Pogamut NetBeans plugin
  - Logging tricks (output window, bot name, text messages, etc.)
  - Debug info in UT2004 provided by GameBots (CTRL + H)
  - How to read Pogamut exceptions
  - What to do when NB aren't showing Javadoc
    - Right click Dependencies -> Download JavaDoc / sources





Recapitulation IV
yaPOSH



- You should know how to use yaPOSH…
  - What is **yaPOSH**
  - What is **competence** and **action pattern** and how to use it
  - How to **create** new senses and actions
  - How to **parameterize** sense and actions
  - How to add actions, senses, competences & a.p. to POSH plan
  - How to **debug** yaPOSH effectively
  - What are the action stages in yaPOSH and when are they called (init(), run() & done())
  - How to prevent accidental yaPOSH cycling in infinite loop (ActionResult.FINISHED mechanics)

Recapitulation V
Online sources

- You should know where to look when you don't know something: http://pogamut.cuni.cz
  - Pogamut JavaDoc (Documentation)
    - http://pogamut.cuni.cz/pogamut_files/latest/doc/javadoc/
  - Latest (devel) JavaDoc (at Maven Sites)
    - http://diana.ms.mff.cuni.cz/maven-sites/pogamut/
  - Pogamut tutorials (Documentation)
    - http://pogamut.cuni.cz/pogamut_files/latest/doc/tutorials/
  - Pogamut example archetypes
    - http://diana.ms.mff.cuni.cz:8081/artifactory/libs-release-local/archetype-catalog.xml
  - Pogamut forums (Forum)
    - http://diana.ms.mff.cuni.cz/main/tiki-forums.php

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Checklist I

I know how to…

- Startup UT2004 dedicated server for Deathmatch & CTF
- Startup UT2004 GUI
- Switch between spectator/player mode inside UT2004
- Run bot project within NetBeans
- Observe bot within the environment
- Stop running bot project from NetBeans

Checklist II

I know how to…

- Get nearest (euclidian / shortest-path-length) and/or visible **`NavPoint`**, **`Item`**, **`Player`**
- Get bot current location and rotation
- What distance of 100 UT units is
- Get other **`NavPoint`**, **`Item`**, **`Player`**
- Get information about your bot current weapons
- Set and use weapon preferences for your bot – **`weaponPrefs`**

Checklist III

I know how to…

- Navigate bot to some **`NavPoint`**
- Navigate bot to some **`Item`**
  - How to setup **`ItemPickedUp`** listener
  - How to move a bit in case that navigation was not 100% perfect
- Navigate bot to some **`Player`**
  - ⇒ Use either **`navigation`** or **`pathExecutor`** and **`fwMap`**
  - ⇒ Setup listener for path events, **STUCK** in particular
- Send text message to global chat
- Start shooting some **`Player`** with weapon preferences
- Get information about CTF game state in **`ctf`** module

Checklist IV

I know how to…

- Start multiple bots at once from **`main()`** method
- Get collection of all **`NavPoints`** in the map
- Get collection of all **`Players`** in the map
- Get collection of all spawned **`Items`** in the map
- Check whether the **`Item`** or **`Player`** is visible
- Use **`MyCollections`**
- Use **`DistanceUtils`**
- Use **`TabooSet`** (initialize, tabooize, filter items)
- Use **`Cooldown`** and **`Heatup`** classes
- Setup listeners, know what is the difference between **`@EventListener`** and **`@ObjectEventListener`** and when to use them

Checklist V

I know how to…

- Locate and open yaPOSH plan in within project explorer inside NetBeans (other sources …)
- Edit yaPOSH plan (add, delete, move actions/senses/competences) using GUI
- Check how yaPOSH plan looks in text
- Create new actions and senses
- Utilize action's **`init(), run() and done()`** methods
- Add variable into your **`Context`** and access it from senses and actions
- Set up parameters of senses and actions and set the parameters in yaPOSH GUI
- Debug the yaPOSH plan inside NetBeans

Checklist VI

I know how to…

- Use logging to your advantage
- Use other means of logging the bot state (text messages, changing of bot name)
- Read Pogamut log and exceptions
- Start project in Debug mode
- Place breakpoints in your code and in the yaPOSH plan
- Use Variables window in NetBeans to introspect bot's variables in Debug mode

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What's next?
Schedule

- 17.5.2013 (Friday), 9:00-11:00 , SW2
  - Pogamut practice final test
- 17.5.2013 (Friday), 12:00-14:00 , SW2
  - Pogamut practice final test
- 20.5.2013 (Monday), 9:00-15:40 , SW1
  - Final exam day
- 23.5.2013 (Thursday), 9:00-15:40, SW1
  - Final exam day

Can I do practice final test?
Conditions

- If you have more than **170 points** you **DON'T** need to do practice final test (auto admitted to exam)
- If you have between **140 - 170 points** you need to do the practice final test!
- If you have between **110 - 140 points** you need to do the bonus homework from today to be admitted to practice final test
- What if I don't have **110 points**? And I did not do one or all of last three homeworks (CollectorBot, POSH DM bot, POSH single CTF Bot)

  => Do these homeworks + bonus homework from today and send them to us ASAP!

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Assigment 11 – Bonus

For those with < 140 points

- Implement at least two bots **CTF team** in **yaPOSH**
  - Use map **CTF-LostFaith**
    - Modify startGameBotsCTFServer.bat to

ucc server CTF-Lostfaith?game=GameBots2004.BotCTFGame? TimeLimit=9999?GoalScore=9999

  - Start from the stub at:
    http://diana.ms.mff.cuni.cz/pogamut_files/lectures/2012-2013/Lecture-11-yaPOSH-CTFBot.zip
  - Bots communicate with each other and cooperate with each other (e.g. attack together, exchange information – where is enemy, flag, etc.)

Assigment 11 – Bonus

For those with < 140 points

- Bots also know to do everything the single CTF bot was able to do:
  - Bot arms himself before going into the action
  - Bot tries to get enemy flag
    - Checks whether he can score
  - Try to get your flag, if it is stolen!
    - Bot fights enemy flag carriers and pick up own flag when he sees it on ground

Assignment 11 – Bonus
Cheatsheet

- TeamChat listener in AttackBotContext:

```
@EventListener(eventClass = TeamChat.class)
public void teamChat(TeamChat event) { }
```

- Information pre-processing in AttackBotLogic:

```
protected void logicBeforePlan() {
        super.logicBeforePlan();
}
```

- Sending team message

```
ctx.getAct().act(new
  SendMessage().setTeamIndex(ctx.getInfo().getTeam()
  ).setText("Help"));
```

- Serializing de-serializing Location to String

```
Location myLocation = new Location(100,100,0);
Location loc = new Location(myLocation.toString());
```

Send your assignments to

- Completely zip-up your project(s) folder
  - Without **`target`** directory!
- Send it to:
  - Jakub Gemrot (Monday practice lessons)
    - jakub.gemrot@gmail.com
  - Michal Bída (Thursday practice lessons)
    - michal.bida@gmail.com
- Write us how much time you have spent on the assignment respectively!

Concluding remarks

- Write us your ideas, remarks, suggestions about Pogamut modules, API, the whole course sylabus etc.
- Email us bugs you'll find or put them to http://pogamut.cuni.cz/pogamut-mantis/
- Did you like Pogamut? You can contact us about bachelor and or master thesis based on Pogamut (or 3D virtual worlds in general).

The End

That's all folks, see you on exam!

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