## Installation: Gorobots\_edu & Lpzrobots (C++)



http://manoonpong.com/MOROCO/manual.pdf

Lpzrobots has been developed by Research Network for Self-Organization of Robot Behavior in Leipzig, Göttingen and Edinburgh

#### **Exercises**

# Robot simulation (C++, gorobots\_edu) Ludo game (Java)





Please follow the installation guide from

http://manoonpong.com/MOROCO/lpz\_guide.txt

https://github.com/pmanoonpong

Import the project settings file, Compile Lpzrobots

```
-- Compile LpzRobots ---
Do you want to compile LpzRobots now? [y/n] : y
--<u>-</u>-make LpzRobots ------
cd /home/poma/workspace/pmanoonpong-lpzrobots-fork
make all
Makefile:7: Makefile.conf: No such file or directory
Generating Makefile.conf (configuration makefile)
You can change your preference by editing Makefile.conf
or just delete it and run make again
                                                    "Your login name"
Where do you want to install the simulator?
Please use either /usr, /usr/local or you home directory
unless you know what you are doing. (no tailing slash)
e.g. (/home/yourlogin) (don' use ~): [/usr/local] /home/poma
```

If you cannot compile Lpzrobots→ may be you have to add this path in .bashrc, otherwise skip this!→ "export PATH=/home/your login/bin:\$PATH"

# definitions for lpzrobots
export CPATH="\$HOME/include"
export LIBRARY\_PATH="\$HOME/lib"
export LD\_LIBRARY\_PATH=S{LD\_LIBRARY\_PATH]:5HOME/lib:/usr/lib/osgPlugins-3.0.1
export PATH=\${PATH}:\$HOME/bin
export PATH=/home/poma/bin:\$PATH

Installation type (user or development): Choose user (u) if you are a user and only program your own simulations (defau lt) Choose devel (d) if you develop the simulator Our choice (u/d): [d] d

Type "d" as developer

Check your settings: Installation to /home/poma (d) development installation All right? [y/N] y

\*\*\*\* Done, you can go and compile your simulations \*\*\*\*

poma@poma-HP-EliteBook-840-G1:~/workspace/pmanoonpong-lpzrobots-fork/ode\_robots/ simulations/nimm2\_arena\$ make

#go to simulations directory

/workspace/yourlogin-lpzrobots fork\ode\_robots\simulations\nimm2\_arena\ make and
 then ./start

- If you have an error about 'libode\_dbl.so.1'
- This is because when you compile lpz-robot to some local directory. A quick fix involves making a symbolic link (with root privilege) that points to the file in your systems /lib/ library.
- for an example:

sudo In –sf home/YOUR USER NAME/lpzrobots/opende/ode/src/.libs/libode\_dbl.so.1 /lib/libode\_dbl.so.1

\*\*\*\* Done, you can go and compile your simulations \*\*\*\*

poma@poma-HP-EliteBook-840-G1:~/workspace/pmanoonpong-lpzrobots-fork/ode\_robots/ simulations/nimm2\_arena\$ make

#### You should see this!



#### Using Lpzrobots

> after start simulation , press 1 to fixed camera view > Ctrl r = record movie > .\start -f = record log file > .\start = start program > .\start -g 1 = display GUI

### Check out a remote branch in git

If you would like to checkout the branch groups, you can simply say this in recent versions of Git:

>> git fetch origin
>> git branch -v -a
This will show all branches
>> git checkout -b stable/ lpzrobots\_ai2\_class
Or >> git checkout -b origin/ lpzrobots\_ai2\_class
This will automatically track origin/groups from a local branch groups. E.g.,

poma@poma-HP-EliteBook-840-G1:~/workspace/pmanoonpong-lpzrobots-fork\$ git fetch origin

Password for 'https://p.manoonpong@git.assembla.com':

poma@poma-HP-EliteBook-840-G1:~/workspace/pmanoonpong-lpzrobots-fork\$ git checkout -b origin/ lpzrobots\_ai2\_class

### Problem of Displaying GUI logger

• Please install " gnuplot-x11"

• sudo apt-get install gnuplot-x11

### Problem of Displaying GUI logger

- guilogger not working (not compiling).
- When installing lpz-robots, there is a small change you need to make before you running "make all".
- Edit lpzrobots/guilogger/configure.sh Change "qmake" into "qmake-qt4".
- This will allow guilogger to compile. Now you can "make all" from the lpzrobots directory.

## Installation

Ubuntu and Lpzrobot simulation

#### Install Ubuntu 18.04

Download Ubuntu software

Ubuntu 18.04 choose alternative downloads on the download website

https://releases.ubuntu.com/bionic/



#### Install Ubuntu 18.04

- After you downloaded the software, please install the Ubuntu 18.04
- You can also see the link below how to install Ubuntu 18.04 step by step alongside With Windows 10 in Dual Boot
- <u>https://www.itzgeek.com/how-tos/linux/ubuntu-how-tos/how-to-install-ubuntu-18-04-alongside-with-windows-10-or-8-in-dual-boot.html</u>

### After installing Ubuntu 18.04

- Please open Ubuntu and open "terminal"
- To open terminal

Click this







#### Installing Lpzrobots

## Follow the instruction from this link <a href="http://manoonpong.com/MOROCO/lpz\_guide.txt">http://manoonpong.com/MOROCO/lpz\_guide.txt</a>

| Activities | 🖾 Terminal 🔻           | Sat 19:42 ● 🛜 📢 🚉 🔹   | 😞 Erontfers   Neural contro × 🐊 fncir-07-00012-g003.jpg × manoonpong.com/MOROCC× + 😔 😔 😒  |
|------------|------------------------|---|---|
| 6          | -                      |   | $\leftarrow \rightarrow C$ $\bigcirc$ $\bowtie$ manoonpong.com/MOROCO/lpz_guide.txt $\blacksquare$ $\overleftrightarrow$ $\boxdot$ $\equiv$   |
| 6          | Trash                  | practices<br>schulans   | getting the hexapod simulation from lpzrobots/gorobots to work<br>for AI3:  |
| 2          | FM                     | File Edit View Search Terminal Help<br>poma@poma-ThinkPad-X1-Carbon-6th:~\$ mkdir workspace | 1. Open a new terminal.<br><ctrl+alt+t></ctrl+alt+t>  |
|            | amosii_<br>experime    | Guidat  | 2. Create a new directory under your home directory:<br>\$ mkdir workspace  |
|            |                        |   | 3. Go into the new workspace folder:<br>\$ cd workspace   |
| -          | FishData_<br>training_ | Step 2: Type -> mkdir workspace and then press "enter                                       | 4. Install git:<br>\$ sudo apt-get install git  |
|            | result                 | Modular<br>Robot<br>Control E   | <pre>5. Clone repositories     \$ git clone https://github.com/pmanoonpong/gorobots_edu.git     \$ git clone https://github.com/pmanoonpong/lpzrobots.git</pre>   |
| A          | GrowthRat<br>eModel    | Then  | 6. Install dependencies:<br>\$ sudo apt-get install g++ make automake libtool xutils-dev m4 libreadline-dev libgsl0-dev libglu-dev libgl1-mesa-dev<br>freeglut3-dev libopenscenegraph-dev libqt4-dev libqt4-opengl libqt4-opengl-dev qt4-qmake libqt4-qt3support gnuplot gnuplot-x11<br>libncurses5-dev libql1-mesa-dev |
| ?          |                        | Step 3: Type $\rightarrow$ cd workspace and then press "enter"                              | 7. Update path:<br>\$ export PATH=/home/ <user>/bin:\$PATH<br/>\$ source ~/.bashrc</user>   |
| <u>a</u>   | Git                    |   | 8. Build LPZ robots:<br>\$ cd lpzrobots<br>\$ make all -j4  |
| 0          | practices              | Step 4 : Type $\rightarrow$ sudo apt-get install git and then press                         | "enter"   |
| >_         |                        |   |   |
|            |                        | Then complete until Step 12!!!  |   |

- Install tutorial:(初学者强烈建议虚拟机,初学者强烈建议虚拟机,初学者强烈建议虚拟机)
- 1 Vmware
- 2 Ubuntu安装: <u>https://www.bilibili.com/video/BV1zt411G7Vn?p=2</u>
- (看完再装,看完再装,看完再装)

(Ubuntu安装完成之后,虚拟机/虚拟机设置/硬件/CD/DVD(SATA)处的连接改为使用物理驱动器,退出ISO镜像文件;) (Ubuntu安装完成之后,虚拟机/虚拟机设置/硬件/CD/DVD(SATA)处的连接改为使用物理驱动器,退出ISO镜像文件;) (Ubuntu安装完成之后,虚拟机/虚拟机设置/硬件/CD/DVD(SATA)处的连接改为使用物理驱动器,退出ISO镜像文件;) (最好安装Vmware tools,最好安装Vmware tools,最好安装Vmware tools)

3 http://manoonpong.com/MOROCO/lpz\_guide.txt

- Problem1: Install the Ubuntu failed;
- Solution: Download other edition ISO Ubuntu, e.g. Ubuntu18.04.01, Ubuntu18.04.04;
- Problem2: Network is not good.Solution:
- Try your phone hotspot. Or choose the best server. And maybe need to wait minuites.
- Problem3: Install git failed
- Before the install git, try \$sudo apt-get update
- Problem4: User is the name before "@". My computer's user is "dongyi".
- Solution: Find your conputer's user.
- Problem5: Be careful about your folder's name. Is it "workspace"?
- Solution: If you use other folder name, replace all "workspace" in the tutorial codes with your folder name.
- Problem6: make sure your step8 make successfully
- Solution: If you failed in the first time, you can repeat this step for sencond time.

| onpong.com/MOR         | Make[1]: Entering directory '/home/yanbin/workspace/gorobots_edu/practices/amosi   |
|------------------------|--|
| /bin:\$PATH            | <pre>make[1]: ode_robots-config: Command not found<br/>make[1]: selforg-config: Command not found<br/>make[1]: selforg-config: Command not found<br/>make[1]: ode_robots-config: Command not found<br/>make[1]: ode_robots-config: Command not found</pre> |
| say:                   | make[1]: selforg-config: Command not found<br>make[1]: selforg-config: Command not found<br>make[1]: ode_robots-config: Command not found<br>g++ -Wall -pipe -Wno-deprecated -I -I, -I, -C -O main o main con  |
| mode (d),              | <pre>main.cpp:26:10: fatal error: ode_robots/simulation.h: No such file or directory #include <ode_robots simulation.h=""></ode_robots></pre>  |
| password               | compilation terminated.<br><builtin>: recipe for target 'main.o' failed<br/>make[1]: *** [main.o] Error 1</builtin>  |
| y<br>orkspace/lpzrobot | make[1]: Leaving directory '/home/yanbin/workspace/gorobots_edu/practices/amosii   |
|                        | Makefile:53: recipe for target 'normal' failed<br>make: *** [normal] Error 2   |
| ulations/templat       | yanbin@yanbin-ThinkPad-X13-Gen-2i:~/workspace/gorobots_edu/practices/amosii\$  |

This means that: you did not successfully complie Lpzrobots in the step 8

→ Build LPZ robots: \$ cd lpzrobots \$ make all -j4

Solution: redo "make all"

- 1>when I install lpz, run step8"make all -j4", i didnot notice some error during compile process
- 2>i continued the installation, still follow the step to the end, it shows the robot, no error.
- 3>then i turn to task1, make clean, then the generated executable file change, cannot make successfully again, shows error
- 4>the solution is turn to step8"make all", i think it show "go to simulation" such notice means it compiled successfully

#### Make sure you use the right "Makefile"



#### 운 master 👻 gorobots\_edu / practices / amosii /

#### pmanoonpong Update PR mechanism

| ۵ | Complete_control_solution.h                      | Update practice for adaptive locomotion control course |
|---|--|--|
| ß | Makefile.conf                                    | Update practice amosii                                 |
| ß | Task1_CPG_control_empty.h                        | Update practice amosii                                 |
| ۵ | Task1_CPG_control_solution.h                     | Update practice for adaptive locomotion control course |
| ß | Task2_CPG_VRN_control_empty.h                    | Update practice amosii                                 |
| ß | Task2_CPG_VRN_control_solution.h                 | Update practice for adaptive locomotion control course |
| ß | Task3_CPG_VRN_MRC_control_empty.h                | Update practice for adaptive locomotion control course |
| ß | Task3_CPG_VRN_MRC_control_solution.h             | Update practice for adaptive locomotion control course |
| ß | Task4_CPG_VRN_MRC_ICO_control_empty.h            | Update practice for adaptive locomotion control course |
| ß | Task4_CPG_VRN_MRC_ICO_control_solution.h         | Update practice for adaptive locomotion control course |
| ß | Task5_CPG_VRN_MRC_ICO_Hormone_control_empty.h    | Update practice for adaptive locomotion control course |
| ß | Task5_CPG_VRN_MRC_ICO_Hormone_control_solution.h | Update practice for adaptive locomotion control course |
| ۵ | Task6_CPG_VRN_MRC_ICO_DecoupledCPGs_control_emp  | Update practice for adaptive locomotion control course |
| ۵ | Task6_CPG_VRN_MRC_ICO_DecoupledCPGs_control_solu | Update PR mechanism                                    |
| ۵ | emptycontroller.h                                | Update practice for adaptive locomotion control course |
| ۵ | main.cpp   | Update practice for adaptive locomotion control course |
| Ľ | rough6.ppm                                       | Update practice amosii                                 |

#### Put it here!!

#### If you have Ubuntu 20

<u>https://github.com/TheWorldOfCode/AI2\_docker</u>

### Appendix

## Installation: Gorobots\_edu & Lpzrobots (C++)



http://manoonpong.com/MOROCO/manual.pdf

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#### **Exercises**

# Robot simulation (C++, gorobots\_edu) Ludo game (Java)





Please follow the installation guide from

http://manoonpong.com/MOROCO/lpz\_guide.txt

https://github.com/pmanoonpong

Import the project settings file, Compile Lpzrobots

```
-- Compile LpzRobots ---
Do you want to compile LpzRobots now? [y/n] : y
--<u>-</u>-make LpzRobots ------
cd /home/poma/workspace/pmanoonpong-lpzrobots-fork
make all
Makefile:7: Makefile.conf: No such file or directory
Generating Makefile.conf (configuration makefile)
You can change your preference by editing Makefile.conf
or just delete it and run make again
                                                    "Your login name"
Where do you want to install the simulator?
Please use either /usr, /usr/local or you home directory
unless you know what you are doing. (no tailing slash)
e.g. (/home/yourlogin) (don' use ~): [/usr/local] /home/poma
```

If you cannot compile Lpzrobots→ may be you have to add this path in .bashrc, otherwise skip this!→ "export PATH=/home/your login/bin:\$PATH"

# definitions for lpzrobots
export CPATH="\$HOME/include"
export LIBRARY\_PATH="\$HOME/lib"
export LD\_LIBRARY\_PATH=S{LD\_LIBRARY\_PATH]:5HOME/lib:/usr/lib/osgPlugins-3.0.1
export PATH=\${PATH}:\$HOME/bin
export PATH=/home/poma/bin:\$PATH

Installation type (user or development): Choose user (u) if you are a user and only program your own simulations (defau lt) Choose devel (d) if you develop the simulator Our choice (u/d): [d] d

Type "d" as developer

Check your settings: Installation to /home/poma (d) development installation All right? [y/N] y

\*\*\*\* Done, you can go and compile your simulations \*\*\*\*

poma@poma-HP-EliteBook-840-G1:~/workspace/pmanoonpong-lpzrobots-fork/ode\_robots/ simulations/nimm2\_arena\$ make

#go to simulations directory

/workspace/yourlogin-lpzrobots fork\ode\_robots\simulations\nimm2\_arena\ make and
 then ./start

- If you have an error about 'libode\_dbl.so.1'
- This is because when you compile lpz-robot to some local directory. A quick fix involves making a symbolic link (with root privilege) that points to the file in your systems /lib/ library.
- for an example:

sudo In –sf home/YOUR USER NAME/lpzrobots/opende/ode/src/.libs/libode\_dbl.so.1 /lib/libode\_dbl.so.1
\*\*\*\* Done, you can go and compile your simulations \*\*\*\*

poma@poma-HP-EliteBook-840-G1:~/workspace/pmanoonpong-lpzrobots-fork/ode\_robots/ simulations/nimm2\_arena\$ make

#### You should see this!



#### Using Lpzrobots

> after start simulation , press 1 to fixed camera view > Ctrl r = record movie > .\start -f = record log file > .\start = start program > .\start -g 1 = display GUI

# Check out a remote branch in git

If you would like to checkout the branch groups, you can simply say this in recent versions of Git:

>> git fetch origin
>> git branch -v -a
This will show all branches
>> git checkout -b stable/ lpzrobots\_ai2\_class
Or >> git checkout -b origin/ lpzrobots\_ai2\_class
This will automatically track origin/groups from a local branch groups. E.g.,

poma@poma-HP-EliteBook-840-G1:~/workspace/pmanoonpong-lpzrobots-fork\$ git fetch origin

Password for 'https://p.manoonpong@git.assembla.com':

poma@poma-HP-EliteBook-840-G1:~/workspace/pmanoonpong-lpzrobots-fork\$ git checkout -b origin/ lpzrobots\_ai2\_class

### Problem of Displaying GUI logger

• Please install " gnuplot-x11"

• sudo apt-get install gnuplot-x11

# Problem of Displaying GUI logger

- guilogger not working (not compiling).
- When installing lpz-robots, there is a small change you need to make before you running "make all".
- Edit lpzrobots/guilogger/configure.sh Change "qmake" into "qmake-qt4".
- This will allow guilogger to compile. Now you can "make all" from the lpzrobots directory.

# Installation: Eclipse editor & compiler



7) Setup editor, e.g., Eclipse → Install Eclipse from Ubuntu Software Center. If you already installed, then just run Eclipse



| Resource - Eclipse Platforn File Edit Navigate Search Project | 1<br>Run Window Help |               |            |
|---|----------------------|---------------|------------|
| 13+ Q+ #+   |                      |               | E Resource |
| Project Explorer 🕮 👘 🗖  |                      |               |            |
| E &   |                      |               |            |
| 문 Outline 않으며 An outline is not available.                    |                      |               |            |
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|   | Tasks 🛙              |               |            |
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| no Ditems selected  |                      |               |            |

Help>> Install New Software>> Add C++ Development Tools

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|---|---|-----------------|--|-----------------------|
| Available S<br>Check the it             | Software<br>tems that you wish to install   |                 |  |                       |
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|   |   |                 |  | More.                 |
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#### Help>> Install New Software>> Add EGit

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#### Help>> Install New Software>> Add EGit

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| EGit          Name       Version         Image: Second Se   |                         | Find more softw                                  | are by working w  | with the "Availa | ble Software Site | s" preferences. |
| Name       Version         Image: Collaboration       1.3.0.201202151440-r         Image: Collaboration       Image: Collaboration         Image: Collaboration       Image:  | EGIL                    |  |                   |                  |                   | (R)             |
| Image: Select All 1.3.0.201202151440-r   Select All Deselect All   Details   Mylyn integration for EGit.  Show only the latest versions of available software Show only software applicable to target environment Contact all update sites during install to find required software Set Next > Cancel Finish  | Name                    |  |                   | Version          |                   |                 |
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#### You should see this after restart Eclipse



#### 8) Importing the Repositories into Eclipse

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#### 8) Importing the Repositories into Eclipse

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| Clone a Git repository                               |            |             |                                      | 13 7     |
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#### Problems with GIT

#### Setting up Repositories in Eclipse

In some cases, the instructions on how to set up the GIT-repositories within Eclipse did not work.

Here is a different approach, that worked for me:

- 1. Import the repositories into the GIT-view of Eclipse, just as described before
- 2. Instead of importing over the GIT-View, you now go onto File  $\rightarrow$  Import  $\rightarrow$  General  $\rightarrow$  Existing Projects into Workspace and you then choose the two repositories
- 3. After Eclipse has imported the files, you can right-click on the Project, and then select Team  $\rightarrow$  Share
- 4. Now, just select GIT and the two GIT-repository-adresses should appear
- 5. Apply

#### Add other repositories!

• git remote add *name* https://your

#### user@git.assembla.com/repository name

poma@poma-HP-EliteBook-840-G1:~/workspace/pmanoonpong-gorobots-fork\$ git remote add stable https://p.manoonpong@git.assembla.com/gorobots.git poma@poma-HP-EliteBook-840-G1:~/workspace/pmanoonpong-gorobots-fork\$ git remote add gorobots\_edu https://p.manoonpong@git.assembla.com/gorobots\_edu.git poma@poma-HP-EliteBook-840-G1:~/workspace/pmanoonpong-gorobots-fork\$ cd ... poma@poma-HP-EliteBook-840-G1:~/workspace\$ cd pmanoonpong-gorobots-fork/ poma@poma-HP-EliteBook-840-G1:~/workspace/pmanoonpong-gorobots-fork\$ git remote add xiaofeng https://p.manoonpong@git.assembla.com/lenonxiong-gorobots.git poma@poma-HP-EliteBook-840-G1:~/workspace/pmanoonpong-gorobots-fork\$ git remote add sakya https://p.manoonpong@git.assembla.com/sakyad-gorobots-fork.git poma@poma-HP-EliteBook-840-G1:~/workspace/pmanoonpong-gorobots-fork\$ git remote add robotdemo https://p.manoonpong@git.assembla.com/RobotDemo-gorobots-fork.git poma@poma-HP-EliteBook-840-G1:~/workspace/pmanoonpong-gorobots-fork\$ git remote add ren https://p.manoonpong@git.assembla.com/sqrgj-gorobots-fork.git poma@poma-HP-EliteBook-840-G1:~/workspace/pmanoonpong-gorobots-fork\$ git remote add eduard https://p.manoonpong@git.assembla.com/eduardg-gorobots-fork.git poma@poma-HP-EliteBook-840-G1:~/workspace/pmanoonpong-gorobots-fork\$ git remote add dennis https://p.manoonpong@git.assembla.com/degoldschmidt-gorobots-fork.git

#### Java project: LUDO game



9) Importing the LUDO project into Eclipse

→ Extract workspacejava in home directory: :~/workspacejava/LUDO

#### File>>New Project>> Java project



#### Browse to /home/your login/workspace/LUDO

| roject Explorer SS                | 😑 🏤 🧶 New Java Project                                    |   |
|-----------------------------------|---|---|
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|                                   | //ome/poma/workspace/LUDO overl<br>'LUDO'                 | aps the location of another project:              |
|                                   | Project name: Ludo  |   |
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|                                   | Working sets  |   |
|                                   | Add project to working sets                               |   |
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|                       | <ul> <li>Details</li> </ul>  |  |
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|                       | Configure inclusion and exclusion filters: speci<br>exclusion filters instead of including and exclu | fy patterns to the inclusion and<br>ding each folder or file manually.   |
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| / ለ፡፡<br>ነው ፡፡                           | <pre>Copyright (C) 2010 by Robot Group Leipzig<br/>martius@informatik.uni-leipzig.de<br/>fhesse@informatik.uni-leipzig.de<br/>der@informatik.uni-leipzig.de<br/>LICENSE:<br/>This work is licensed under the Creative Commons<br/>Attribution-NonCommercial-ShareAlike 2.5 License. To view a copy of<br/>this license, visit http://creativecommons.org/licenses/by-nc-sa/2.5/<br/>or send a letter to Creative Commons, 543 Howard Street, 5th Floor,<br/>San Francisco, California, 94105, USA.<br/>This program is distributed in the hope that it will be useful,<br/>but WITHOUT ANY WARRANTY; without even the implied warranty of<br/>MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE.<br/>\$Log: tripodgate18dof.cpp,v \$<br/>#include <selforo controller="" misc.be<="" pre=""></selforo></pre> | Ernd GE + All + Activate   |
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| Run as Java application                  | Problems @ Javadoc @ Declaration @ Console 33  |  |
|  | <terminated> LUDO (1) [Java Application] /usr/lib/jvm/java-6-openjdk-amd64/bin/java (Jan 2, 2014 1:0:<br/>Playing Ludo</terminated>  | 3:58 AM)   |



Click die to start the game

#### For a 64 bit PC

You might need to update gcc

sudo add-apt-repository ppa:ubuntu-toolchain-r/test

sudo apt-get update sudo apt-get install gcc-4.8

sudo update-alternatives --install /usr/bin/gcc gcc /usr/bin/gcc-4.8 50

Upgrade your Ubuntu system to avoid system freeze apt-get dist-upgrade

#### Such a problem might occur when compiling a program

./start: symbol lookup error: /usr/lib/libgsl.so.0: undefined symbol: cblas\_dnrm2

solve by adding this in Makefile.conf
" LIBS = -WI,--no-as-needed -lgsl -lgslcblas -lm "

#### Problem



#### Problem

4-34 DM ......

| Package Explorer 😫                  |  | - D 🗐 Task List 🕱 - 🗆   |
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|                                     | Select root directory: //home/poma/workspace/pmanoonpong-lpzrobots-fork     Browse         | Connect Mylyn     Connect to your task and ALM tools     or create a local task |
|                                     | O Select archive file: Browse  |   |
|                                     | Projects:  | An outline is not available.  |
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#### Problem

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| LUPAE V2b  |  |  |

#### Solution

• File->Import->C/C++->Existing Code as Makefile Project.



#### Solution

• File->Import->C/C++->Existing Code as Makefile Project.


#### Nimm4 system



#### Hexapod system

#### **AMOS** simulation

#### Sensors:

\_as = angle sensors = [-1,...,1]; -1 = backward, down, flex; +1 = forward, up, extend

\_fs = foot sensors = [0,...,1]; 0 = swing (off ground); +1 = stance (touch ground)



#### Sensors

Goal detection sensors



Goal 1  $\rightarrow$  Distance in X = 62 Distance in Y = 63 Distance in Z = 64

 $X \rightarrow$  = goal at front = +, goal behind = -

 $\neg$  Z $\rightarrow$  Above the ground = - value

**-V** 

 $Y \rightarrow$  Left = +, right = -

Goal 2  $\rightarrow$  Distance in X = 72 Distance in Y = 73

+V

Distance in Z = 74

Goal 3  $\rightarrow$  Distance in X = 78 Distance in Y = 79 Distance in Z = 80

#### Motors:



|  | Deg | Activation |
|--|-----|------------|
|  | -70 | -1.001     |
|  | -60 | -0.858     |
| .70 Маке – 4                           | -50 | -0.715     |
| +70 Max = $+1$                         | -40 | -0.572     |
| Front joints +60 Max of normal walking | -30 | -0.429     |
|  | -20 | -0.286     |
|  | -10 | -0.143     |
|  | 0   | 0          |
|  | 10  | 0.143      |
|  | 20  | 0.286      |
|  | 30  | 0.429      |
| - $  70$ Min = -1                      | 40  | 0.572      |
|  | 50  | 0.715      |
| O = O                                  | 60  | 0.858      |
|  | 70  | 1.001      |



|                            |     | 4          |
|----------------------------|-----|------------|
|                            | Deg | Activation |
|                            | -60 | -1.002     |
|                            | -50 | -0.835     |
|                            | -40 | -0.668     |
| Middle joints +60 Max = +1 | -30 | -0.501     |
| $\bigcirc$                 | -20 | -0.334     |
| +30 Max of normal walking  | -10 | -0.167     |
|                            | 0   | 0          |
|                            | 10  | 0.167      |
|                            | 20  | 0.334      |
| -40 Min of normal walking  | 30  | 0.501      |
|                            | 40  | 0.668      |
| -60 Min = -1               | 50  | 0.835      |
|                            | 60  | 1.002      |
|                            |     |            |



|                           | Deg | Activation |
|---------------------------|-----|------------|
|                           | -70 | -1.001     |
|                           | -60 | -0.858     |
| Lilling al. La Sun fra    | -50 | -0.715     |
| Hind Joints               | -40 | -0.572     |
| $\bigcirc$                | -30 | -0.429     |
| +70 Max = +1              | -20 | -0.286     |
|                           | -10 | -0.143     |
|                           | 0   | 0          |
| +10 Max of normal walking | 10  | 0.143      |
| 0 ref                     | 20  | 0.286      |
| $\sim 0 \sim 10$          | 30  | 0.429      |
|                           | 40  | 0.572      |
|                           | 50  | 0.715      |
| -60 Min of normal walking | 60  | 0.858      |
| -70 Min = -1              | 70  | 1.001      |



| CTr-joints<br>Max (+1)<br>(Elevation) | +70 deg = max +1                           |
|---------------------------------------|--|
|                                       |  |
| 0 deg                                 | TRO  |
| R1                                    |  |
| -7                                    | 0 deg = max -1<br>Min (-1)<br>(Depression) |

| Deg | Activation |
|-----|------------|
| -70 | -1.001     |
| -60 | -0.858     |
| -50 | -0.715     |
| -40 | -0.572     |
| -30 | -0.429     |
| -20 | -0.286     |
| -10 | -0.143     |
| 0   | 0          |
| 10  | 0.143      |
| 20  | 0.286      |
| 30  | 0.429      |
| 40  | 0.572      |
| 50  | 0.715      |
| 60  | 0.858      |
| 70  | 1.001      |



| 1                             | Activati<br>on | 0.0006  |
|-------------------------------|----------------|---------|
|                               | -20            | 0.9990  |
| (CR) TR                       | -30            | 0.01/0  |
|                               | -40            | 0.6356  |
| F II-joints                   | -50            | 0.4536  |
|                               | -60            | 0.2716  |
| 0 deg ref $-130$ deg = MIN -1 | -70            | 0.0896  |
| R1                            | -80            | -0.0924 |
|                               | -90            | -0.2744 |
|                               | -100           | -0.4564 |
| -20 deg = MAX +1              | -110           | -0.6384 |
|                               | -120           | -0.8204 |
|                               | -130           | -1.0024 |



# Installation: Eclipse editor & compiler



7) Setup editor, e.g., Eclipse → Install Eclipse from Ubuntu Software Center. If you already installed, then just run Eclipse



| Resource - Eclipse Platforn File Edit Navigate Search Project | 1<br>Run Window Help |               |            |
|---|----------------------|---------------|------------|
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Help>> Install New Software>> Add C++ Development Tools

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#### You should see this after restart Eclipse



#### 8) Importing the Repositories into Eclipse

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#### 8) Importing the Repositories into Eclipse

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| e≦<br>▶ ∰ Binaries                                 | Configure Git Repository<br>Select Git repository location |         |            | GIT |
| includes   | Se or create repository in parent folder of project        |         |            |     |
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#### Problems with GIT

#### Setting up Repositories in Eclipse

In some cases, the instructions on how to set up the GIT-repositories within Eclipse did not work.

Here is a different approach, that worked for me:

- 1. Import the repositories into the GIT-view of Eclipse, just as described before
- 2. Instead of importing over the GIT-View, you now go onto File  $\rightarrow$  Import  $\rightarrow$  General  $\rightarrow$  Existing Projects into Workspace and you then choose the two repositories
- 3. After Eclipse has imported the files, you can right-click on the Project, and then select Team  $\rightarrow$  Share
- 4. Now, just select GIT and the two GIT-repository-adresses should appear
- 5. Apply

### Add other repositories!

• git remote add *name* https://your

#### user@git.assembla.com/repository name

poma@poma-HP-EliteBook-840-G1:~/workspace/pmanoonpong-gorobots-fork\$ git remote add stable https://p.manoonpong@git.assembla.com/gorobots.git poma@poma-HP-EliteBook-840-G1:~/workspace/pmanoonpong-gorobots-fork\$ git remote add gorobots\_edu https://p.manoonpong@git.assembla.com/gorobots\_edu.git poma@poma-HP-EliteBook-840-G1:~/workspace/pmanoonpong-gorobots-fork\$ cd ... poma@poma-HP-EliteBook-840-G1:~/workspace\$ cd pmanoonpong-gorobots-fork/ poma@poma-HP-EliteBook-840-G1:~/workspace/pmanoonpong-gorobots-fork\$ git remote add xiaofeng https://p.manoonpong@git.assembla.com/lenonxiong-gorobots.git poma@poma-HP-EliteBook-840-G1:~/workspace/pmanoonpong-gorobots-fork\$ git remote add sakya https://p.manoonpong@git.assembla.com/sakyad-gorobots-fork.git poma@poma-HP-EliteBook-840-G1:~/workspace/pmanoonpong-gorobots-fork\$ git remote add robotdemo https://p.manoonpong@git.assembla.com/RobotDemo-gorobots-fork.git poma@poma-HP-EliteBook-840-G1:~/workspace/pmanoonpong-gorobots-fork\$ git remote add ren https://p.manoonpong@git.assembla.com/sqrgj-gorobots-fork.git poma@poma-HP-EliteBook-840-G1:~/workspace/pmanoonpong-gorobots-fork\$ git remote add eduard https://p.manoonpong@git.assembla.com/eduardg-gorobots-fork.git poma@poma-HP-EliteBook-840-G1:~/workspace/pmanoonpong-gorobots-fork\$ git remote add dennis https://p.manoonpong@git.assembla.com/degoldschmidt-gorobots-fork.git

#### Java project: LUDO game



9) Importing the LUDO project into Eclipse

→ Extract workspacejava in home directory: :~/workspacejava/LUDO
#### File>>New Project>> Java project



#### Browse to /home/your login/workspace/LUDO

| Project Explorer 23               | 😑 💁 🧧 New Java Project                                    |   |
|-----------------------------------|---|---|
| pmanoonpong-gorobots-fork [pmanoo | npong-gorobots-fork m                                     |   |
|                                   | //ome/poma/workspace/LUDO overl<br>'LUDO'                 | aps the location of another project:              |
|                                   | Project name: Ludo  |   |
|                                   | Use default location                                      |   |
|                                   | Location: /home/poma/workspace/L                          | UDO Browse  |
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|                                   | (E) Use an execution environment JR                       | E JavaSE-1.6                                      |
|                                   | III Use a project specific JRE:                           | java-a-openidk-amdö4 🙄                            |
|                                   | Use deFault JRE (currently java-6                         | open(dk-amd64') Configure JREs                    |
|                                   | Project layout  |   |
|                                   | Use project folder as root for so                         | irces and class files                             |
|                                   | (a) Create separate folders for source                    | ces and class files <u>Configure default</u>      |
|                                   | Working sets  |   |
|                                   | Add project to working sets                               |   |
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|                       | <ul> <li>Details</li> </ul>   |  |  |
|                       | Create new source folder: use this if you want project.   | to add a new source folder to your   |  |
|                       | Link additional source: use this if you have a for<br>used as additional source folder.   | older in the file system that should be  |  |
|                       | Configure inclusion and exclusion filters: species exclusion filters instead of including and exclusion filters instead of including and exclusion filters. | Configure inclusion and exclusion filters: specify patterns to the inclusion and<br>exclusion filters instead of including and excluding each folder or file manually.   |  |
|                       | Remove project 'LUDO' from build path: Child  | ren of the project which are not   |  |
|                       | Allow output folders for source folders   | and the second sec |  |
|                       | Default output folder:  |  |  |
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|  | LICENSE:<br>This work is licensed under the Creative Commons<br>Attribution-NonCommercial-ShareAlike 2.5 License, To view a copy of<br>this license, visit http://creativecommons.org/licenses/by-nc-sa/2.5/<br>or send a letter to Creative Commons, 543 Howard Street, 5th Floor, | Connect Mylyn <u>Connect</u> to your task and ALM tog     or <u>create</u> a local task.   |
|  | San Francisco, California, 94105, USA.  | BE Outline 22  |
|  | <ul> <li>This program is distributed in the hope that it will be useful,</li> <li>but WITHOUT ANY WARRANTY; without even the implied warranty of</li> </ul>   | 12 × × • *   |
|  | MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE.<br>\$Log: tripodgate18dof.cpp,v \$<br>#include <selforg controller="" misc.h=""></selforg>   | <ul> <li>selforg/controller_misc.h</li> <li>cmath</li> <li>osg/Vec3</li> <li>amosilcontrol.h</li> <li>ode_robots/amosil.h</li> <li>matrix</li> </ul> |
| Run as Java application  | Problems @ Javadoc @ Declaration @ Console X  |  |
|  | <terminated> LUDO (1) [Java Application] /usr/lib/jvm/java-6-openjdk-amd64/bin/java (Jan 2, 2014 1:0<br/>Playing Ludo</terminated>  | 13:58 AM)  |



Click die to start the game

### For a 64 bit PC

You might need to update gcc

sudo add-apt-repository ppa:ubuntu-toolchain-r/test

sudo apt-get update sudo apt-get install gcc-4.8

sudo update-alternatives --install /usr/bin/gcc gcc /usr/bin/gcc-4.8 50

Upgrade your Ubuntu system to avoid system freeze apt-get dist-upgrade

#### Such a problem might occur when compiling a program

./start: symbol lookup error: /usr/lib/libgsl.so.0: undefined symbol: cblas\_dnrm2

solve by adding this in Makefile.conf
" LIBS = -WI,--no-as-needed -lgsl -lgslcblas -lm "

## Problem



## Problem

4-34 DM ......

| Package Explorer 😫           |  | - D 🗐 Task List 🕱 - 🗆   |
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| LUDO                         |  | C+ € + > × ■ 40 ▼   |
| <b>ະຕິ</b> ກາະເຫັນດັກການເຊັ່ | Import Projects       Select a directory to search for existing Eclipse projects.          | Find (28) > All > Activate  |
|                              | Select root directory: //home/poma/workspace/pmanoonpong-lpzrobots-fork     Browse         | Connect Mylyn     Connect to your task and ALM tools     or create a local task |
|                              | O Select archive file: Browse  |   |
|                              | Projects:  | An outline is not available.  |
|                              | LUPAE_V2b (/home/poma/workspace/pmanoonpong-lpzrobots-fork/ecbrobots/lupae)     Select All |   |
|                              | Deselect All   |   |
|                              | Refresh  |   |
|                              | ☑ Copy projects into workspace           Working sets                                      |   |
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|                              | (?) < Back Next > Cancel Finish  |   |

## Problem

| <b>Platform</b><br>Edit Source Refactor Navigate Search Project Run Window Help           | 🗱 en 🛽   | 🏾 🗈 🖇 奈 🕪) 4:32 PM 👤 poma 🔱                          |
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| ackage Explorer 😫 👘 🖷   | - 8  | 1 🗐 Task List 🕱 📃 🗖                                  |
| LUDO<br>LUPAE_V2b   |  |  |
| ⇒ images<br>⇒ moc<br>⇒ src<br>application.pro   |  | Connect Mylyn     Connect to your task and ALM tools |
| AVR_Device_List.xml pmanoonpong-gorobots-fork [pmanoonpong-gorobots-fork gorobots_master] |  | or <u>create</u> a local task.                       |
|   | Problems @ Javadoc 😥 Declaration 🗳 Console 🖨 History 🛿 | <u>م</u> الم     |
|   |  |  |
| LUPAE V2b   |  |  |

# Solution

• File->Import->C/C++->Existing Code as Makefile Project.



# Solution

• File->Import->C/C++->Existing Code as Makefile Project.



#### Nimm4 system



## Hexapod system

### **AMOS** simulation

#### Sensors:

\_as = angle sensors = [-1,...,1]; -1 = backward, down, flex; +1 = forward, up, extend

\_fs = foot sensors = [0,...,1]; 0 = swing (off ground); +1 = stance (touch ground)



#### Sensors

Goal detection sensors



Goal 1  $\rightarrow$  Distance in X = 62 Distance in Y = 63 Distance in Z = 64

 $X \rightarrow$  = goal at front = +, goal behind = -

 $\neg$  Z $\rightarrow$  Above the ground = - value

**-V** 

 $Y \rightarrow$  Left = +, right = -

Goal 2  $\rightarrow$  Distance in X = 72 Distance in Y = 73

+V

Distance in Z = 74

Goal 3  $\rightarrow$  Distance in X = 78 Distance in Y = 79 Distance in Z = 80

#### Motors:



|  | Deg | Activation |
|--|-----|------------|
|  | -70 | -1.001     |
|  | -60 | -0.858     |
| .70 Маке и 4                           | -50 | -0.715     |
| +70 Max = $+1$                         | -40 | -0.572     |
| Front joints +60 Max of normal walking | -30 | -0.429     |
|  | -20 | -0.286     |
|  | -10 | -0.143     |
|  | 0   | 0          |
|  | 10  | 0.143      |
| -10 Min of normal walking              | 20  | 0.286      |
|  | 30  | 0.429      |
| - $  70$ Min = -1                      | 40  | 0.572      |
|  | 50  | 0.715      |
| O = O                                  | 60  | 0.858      |
|  | 70  | 1.001      |



|                            | Deg | Activation |
|----------------------------|-----|------------|
|                            | -60 | -1.002     |
|                            | -50 | -0.835     |
|                            | -40 | -0.668     |
| Middle joints +60 Max = +1 | -30 | -0.501     |
| $\bigcirc$                 | -20 | -0.334     |
| +30 Max of normal walking  | -10 | -0.167     |
|                            | 0   | 0          |
|                            | 10  | 0.167      |
|                            | 20  | 0.334      |
| -40 Min of normal walking  | 30  | 0.501      |
|                            | 40  | 0.668      |
| -60 Min = -1               | 50  | 0.835      |
|                            | 60  | 1.002      |
|                            |     |            |



|                           | Deg | Activation |
|---------------------------|-----|------------|
|                           | -70 | -1.001     |
|                           | -60 | -0.858     |
| Lilling al. La Sun fra    | -50 | -0.715     |
| Hind joints               | -40 | -0.572     |
| $\bigcirc$                | -30 | -0.429     |
| +70 Max = +1              | -20 | -0.286     |
|                           | -10 | -0.143     |
|                           | 0   | 0          |
| +10 Max of normal walking | 10  | 0.143      |
| 0 ref                     | 20  | 0.286      |
| $\sim 0 \sim 10$          | 30  | 0.429      |
|                           | 40  | 0.572      |
|                           | 50  | 0.715      |
| -60 Min of normal walking | 60  | 0.858      |
| -70 Min = -1              | 70  | 1.001      |



| CTr-joints<br>Max (+1)<br>(Elevation) | +70 deg = max +1                           |
|---------------------------------------|--|
|                                       |  |
| 0 deg                                 | TRO  |
| R1                                    |  |
| -7                                    | 0 deg = max -1<br>Min (-1)<br>(Depression) |

| Deg | Activation |
|-----|------------|
| -70 | -1.001     |
| -60 | -0.858     |
| -50 | -0.715     |
| -40 | -0.572     |
| -30 | -0.429     |
| -20 | -0.286     |
| -10 | -0.143     |
| 0   | 0          |
| 10  | 0.143      |
| 20  | 0.286      |
| 30  | 0.429      |
| 40  | 0.572      |
| 50  | 0.715      |
| 60  | 0.858      |
| 70  | 1.001      |



|                             | Activati<br>on | 0.0006  |
|-----------------------------|----------------|---------|
|                             | -20            | 0.9990  |
| CRO TRA                     | -50            | 0.6170  |
| ETi-joints                  | -40            | 0.6356  |
|                             | -50            | 0.4536  |
|                             | -60            | 0.2716  |
| 0 deg ref -130 deg = MIN -1 | -70            | 0.0896  |
| R1                          | -80            | -0.0924 |
|                             | -90            | -0.2744 |
|                             | -100           | -0.4564 |
| -20 deg = MAX +1            | -110           | -0.6384 |
|                             | -120           | -0.8204 |
|                             | -130           | -1.0024 |

