**GAZEBO KURULUM VE GİRİŞ**

**KURULUM**

Kurulumu gerçekleştirmek için aşağıdaki satırı terminale girmek yeterli. İnternet sitesinde uzun şekilde indirmede mevcut.

Önemli curl -sSL <http://get.gazebosim.org> | sh

Makine tarafından oluşturulan alternatif metin:
curt -sSL http://get.gazebosim.org I 
GAZEBO INSTALLATİON SCRİPT 
This scrtpt is installtng the latest stable version of 
Gazebo Simulator avatlable from your package manager 
Warning: the "gazebo” command appears to already extst on thts system. 
if you already have gazebo installed, thts scrtpt can cause trouble, whtch is 
why we' re displaying this warning and provide the opportunity to cancel the 
installation. 
if you installed the current gazebo package ustng thts scrtpt and are ustng it 
again to update gazebo, you can safely ignore this message. 
You may press CtrI+C now to abort thts scrtpt. 

Makine tarafından oluşturulan alternatif metin:
in Ubuntu thts scrtpt setup the osrfoundatton 
r 2A2Ötory to install the latest package available 
+ sudo -E Sh -c apt-key adv --keyserver keyserver . ubuntu.com --recv-keys D2486D2DD83DB69272AFE988 
67170598AF249743 
Executing: /tmp/apt-key-gpghome .AZzzIptZcl/gpg.1.sh 
-keyserver keyserver . ubuntu . com - -recv-keys 
D2486D2DD83DB69272AFE98867170598AF249743 
gpg: key 67170598AF249743: public key "OSRF Reposttory (OSRF Reposttory GPG key) cosrfbuild@osrfo 
undation.org”' imported 
gpg: Total number processed: 1 
gpg : 
imported: 1 
+ sudo -E Sh -c mkdir -p /etc/apt/sources.list.d 
+ sudo -E Sh -c echo deb http://packages.osrfoundation.org/gazebo/ubuntu bionic main /etc/apt/s 
ources . list .d/gazebo-stable . list 
+ sudo -E Sh -c sleep 3; apt-get update; apt-get install -y -q libgazeb09-dev 
Hit: 1 http://security . ubuntu.com/ubuntu bionic-security InReIease 
Hit: 2 http://tr.archive.ubuntu.com/ubuntu bionic InReIease 
Hit: 3 http://tr.archive.ubuntu.com/ubuntu bionic-updates InReIease 
Hit:4 http://tr.archive.ubuntu.com/ubuntu bionic-backports InReIease 
Hit: 5 http://packages.ros.org/ros/ubuntu bionic InReIease 
Get:6 http://packages.osrfoundation.org/gazebo/ubuntu biontc InReIease [4.250 B] 
Get:7 http://packages.osrfoundation.org/gazebo/ubuntu bionic/main 1386 Packages [42,4 kB] 
Get:8 http://packages.osrfoundation.org/gazebo/ubuntu bionic/main amd64 Packages [45,8 kB] 
Fetched 92, 
4 kB in 2s (52,3 kB/s) 
Reading package lists. 
Done 
E: Could not get lock /var/ltb/dpkg/lock-frontend - open (11: Resource temporartly unavailable) 
E: Unable to acquire the dpkg frontend lock (/var/lib/dpkg/lock-frontend), is another process ust 
ng it? 
gardiar@gardiar : —Ş 

* Gazebo’yu açmak için terminale ‘gazebo’ yazmak yeterli.

Makine tarafından oluşturulan alternatif metin:
gazebo 
[Err] [REST.cc:205] Error in REST request 
libcurl: (51) SSL: no alternative certtftcate subject name matches target host name 'apt. ignttton 
fuel.org ' 

Makine tarafından oluşturulan alternatif metin:
Activities 
Gazebo 
Edit Camera View Window 
Scene 
Spherical Coordinates 
Physics 
Atmosphere 
Help 
0.97 
prş 21:06 . 
Gaze bo 
Sim Time: 
File 
II 
Steps: 
iterations: 
75949 
FPş: 
10.99 
Reset Time 
Real Time: 
Wind 
Models 
Lights 
Propert 
Value 
1 v Real Time Factor: 

**GİRİŞ**

* Gazeboda hazır olan ortamı açmak için ‘gazebo [dosya konumu]’ giriyoruz
* gazebo worlds/pioneer2dx.world

ls /usr/share/gazebo-7/worlds

Önemli Gazebo server-client olarak çalışır.

Önemli Server kısmı kullanıcı arayüzü içermez. Fiziksel güncellemeleri loop olarak döndürür ve sensör data verileri tutar. Server kısmı Gazebo'nun core kısmını oluşturur.

Önemli Client kısmı QT tabanlı kontrolleri ve görsel simülasyonu gerçekleştirebildiğimiz ortamdır.

Server -> gzserver

Client -> gzclient

Önemli Upper Toolbar:

Makine tarafından oluşturulan alternatif metin:
ndo/Red 
IPas 

Önemli Bottom Toolbar:

Makine tarafından oluşturulan alternatif metin:
Play/pause sim 
Ratio of Sim Time to Real Time 
Time passed in real life 
Frames per second 
Real Time: 
iterations: 
# of intemal updates 
II 
Steps I Real Time Factor: 
Sim Time: 
Step foward 
Steps to skip 
Reset sim 
Time passed in sımulation 

Önemli Menu:

Makine tarafından oluşturulan alternatif metin:
File Edit 
Felp 
Reset Model Poses (Reset models to original poses; do not reset time) 
Reset World (Reset everyffiing in worlö; reset ime) 
Building Editor (Construct a building) 
Model Editor (Build an adiculated ob]ect) 
WİNDOW 
Topic Vısualization (Visualize messages being publisheö per topic) 
Oculus Rift (Integrate an Oculus Rifi) 
Show GUİ Overlays (Snow overlays trom Gül Plugins) 
Show Toobars (Show/hide top & totom toolbars) 
Full Screen (Make the Scene full screen) 
CAMERA 
Orthographic (View the scene with no perspectve) 
Perspective (View scene with perspective projection) 
FPS View Control (Control View as First-?erson Shooter: WASD keys & mouse) 
Orbit View Control (Control View by rotating arounö a Point with tne mouse) 
Reset View Angle (Move View to the initial wse) 
HELP 
Hotkey Chart (Open hot key Chart) 
About (View info about Gazebo) 
Save World (Save me World as-is) 
Save World As (Save the World as-is & proviöe a name) 
Save Configuration (Save nur Gazebo intefface configuration) 
Clone World (Start new simulation trom the current state) 
Quit (QuitJcIose Gazebo) 
VİEW 
Grid (Display ground plane grid) 
Origin IDispIay World origin) 
Transparent (Display models as transparent) 
Wireframe (Display models as wireframe) 
Collsions (Display model collisions) 
Joınts (Display model joints) 
Center of Mass (Display model centers of mass) 
inelias (Display model ineıtias) 
Contacts (Display collision points) 
Link Frames (Display coordinate frames for links) 

Önemli Mouse Control:

Makine tarafından oluşturulan alternatif metin:
Drag rotate 
Drag pan 
Drag + Shift rotate 
Double-click move to point 
Drag up zoom in 
Drag down zoom out 
Single-click opens context menu 
Scroll zoom in/out 

**Diğer Araştırmada İncelenecekler**

<https://dev.px4.io/v1.9.0/en/simulation/gazebo.html>

youtube.com/watch?v=-WfTr1-OBGQ&feature=youtu.be