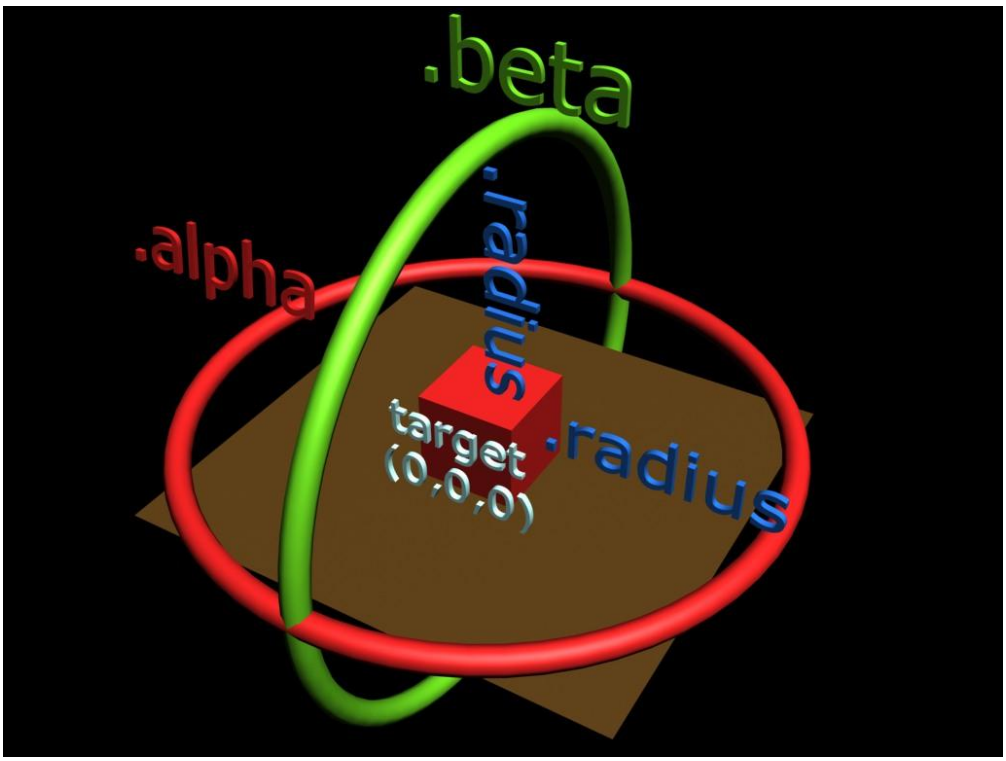
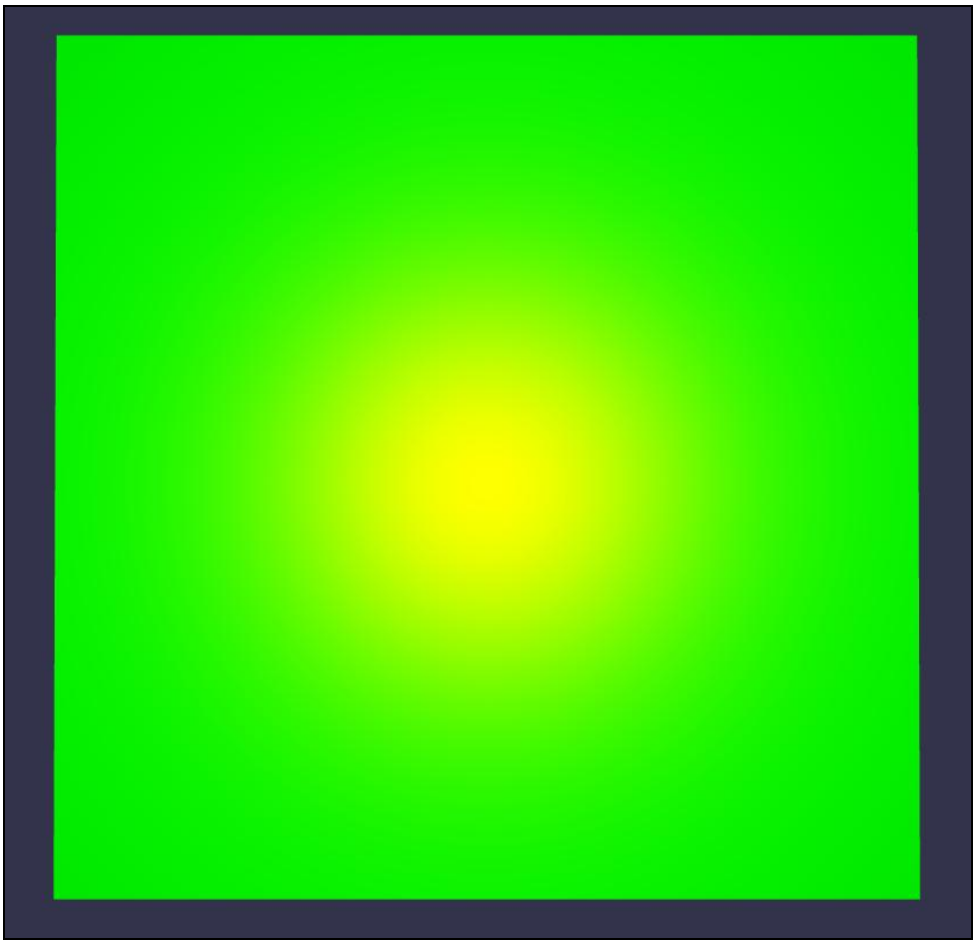
Chapter 1: Babylon.js and the TypeScript Language

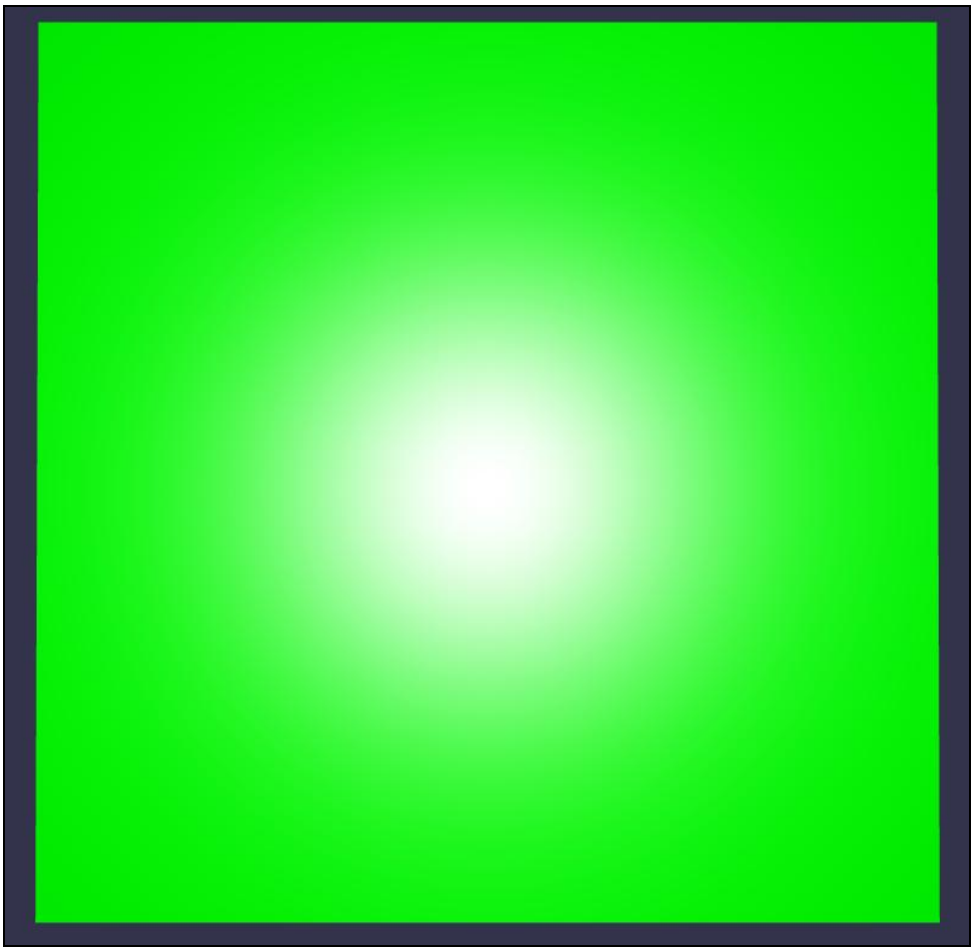
types.ts

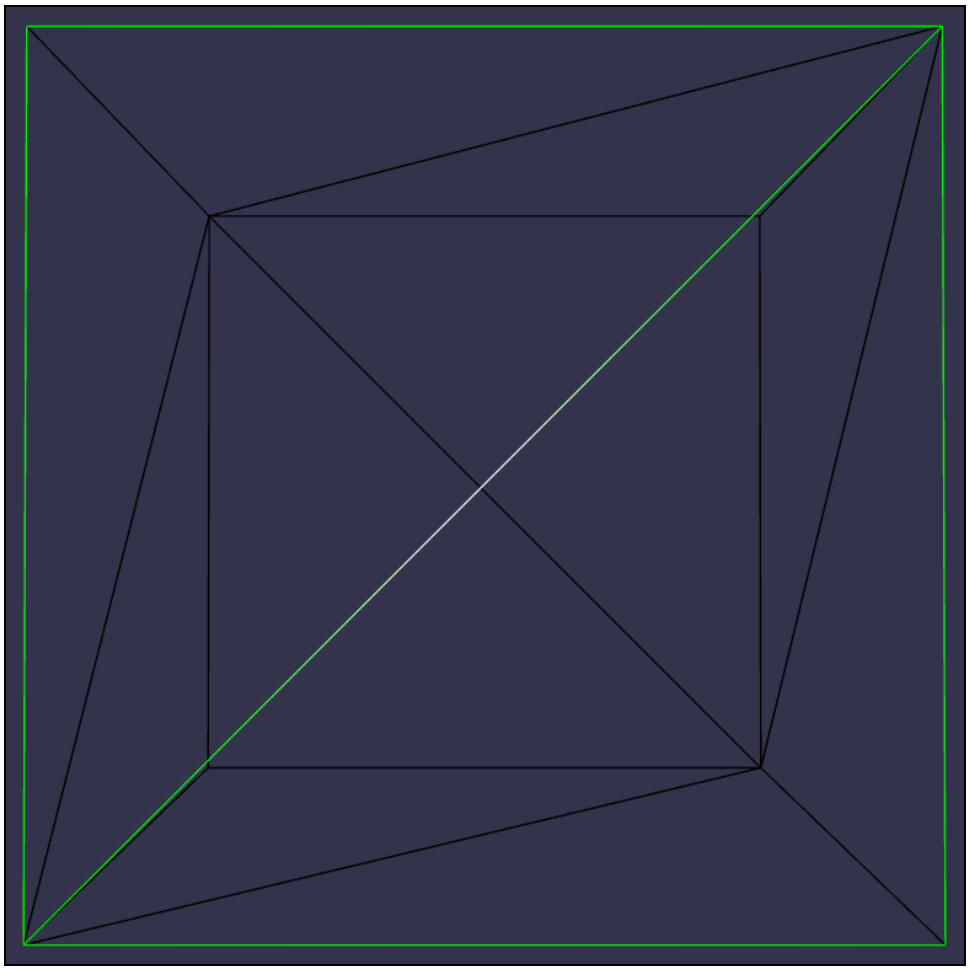
```
this.trainWithTypes = () => {
    var notSpecified = 1.0;
    var specified: number = 1.0;
    var anySpecified: any = 1.0;

    notSpecified = "Hello !";
    anySpecified = "Hello !";
};

```

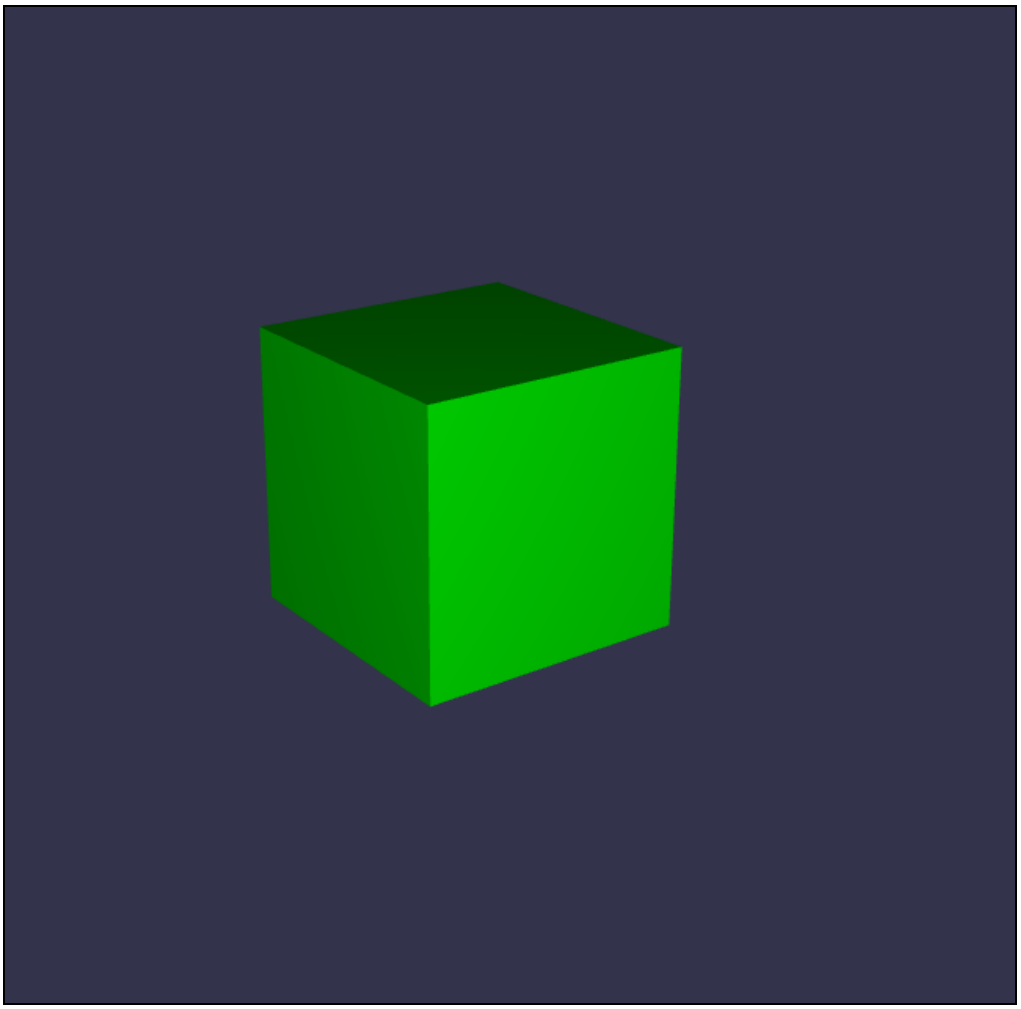
Chapter 2: The Fundamentals of Babylon.js and Available Tools

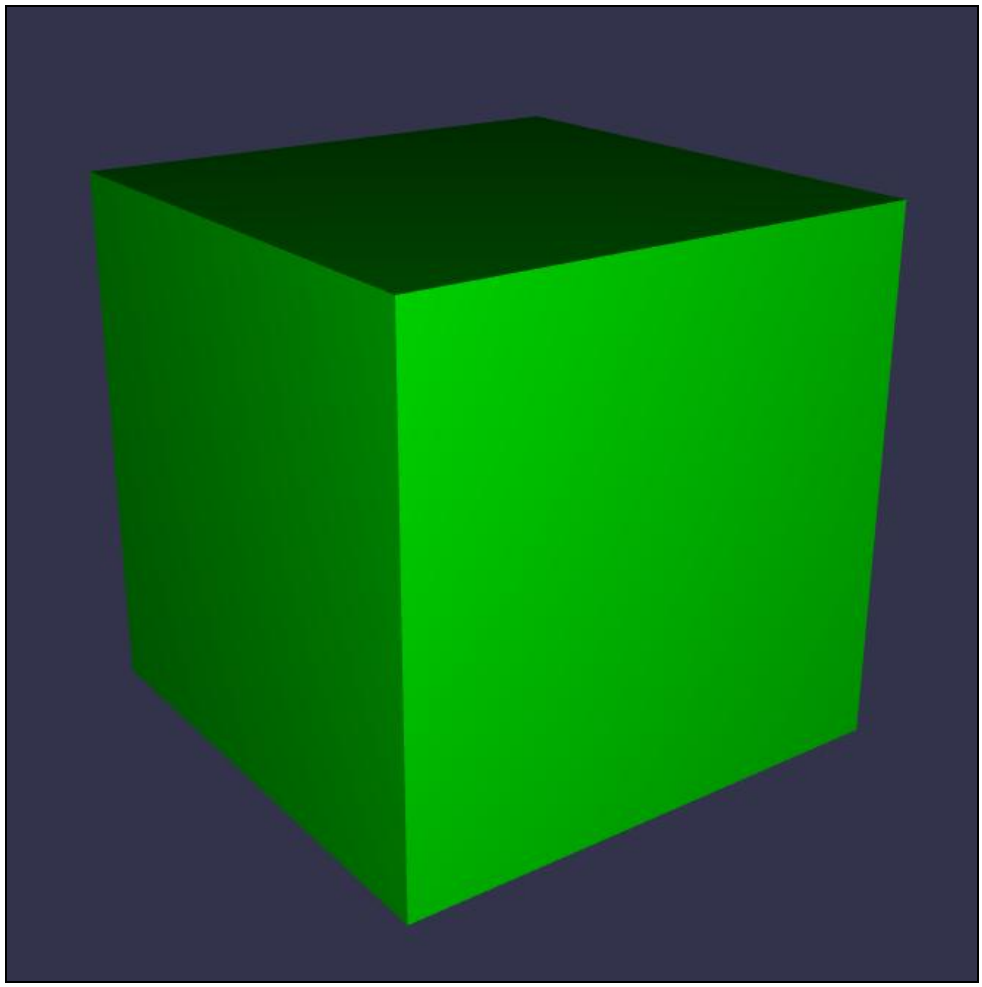


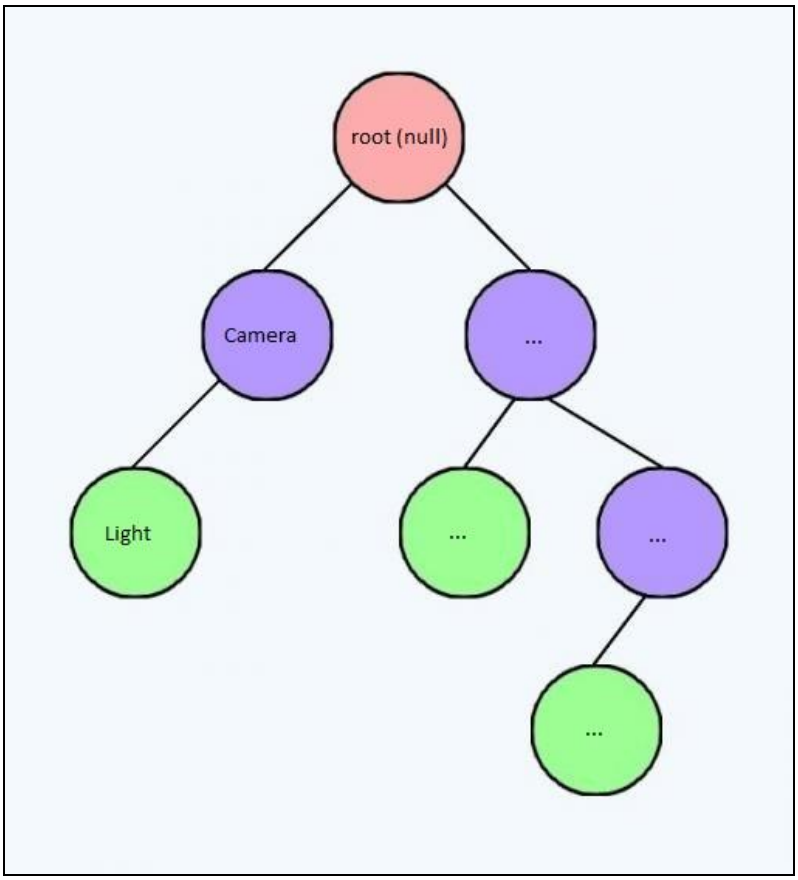




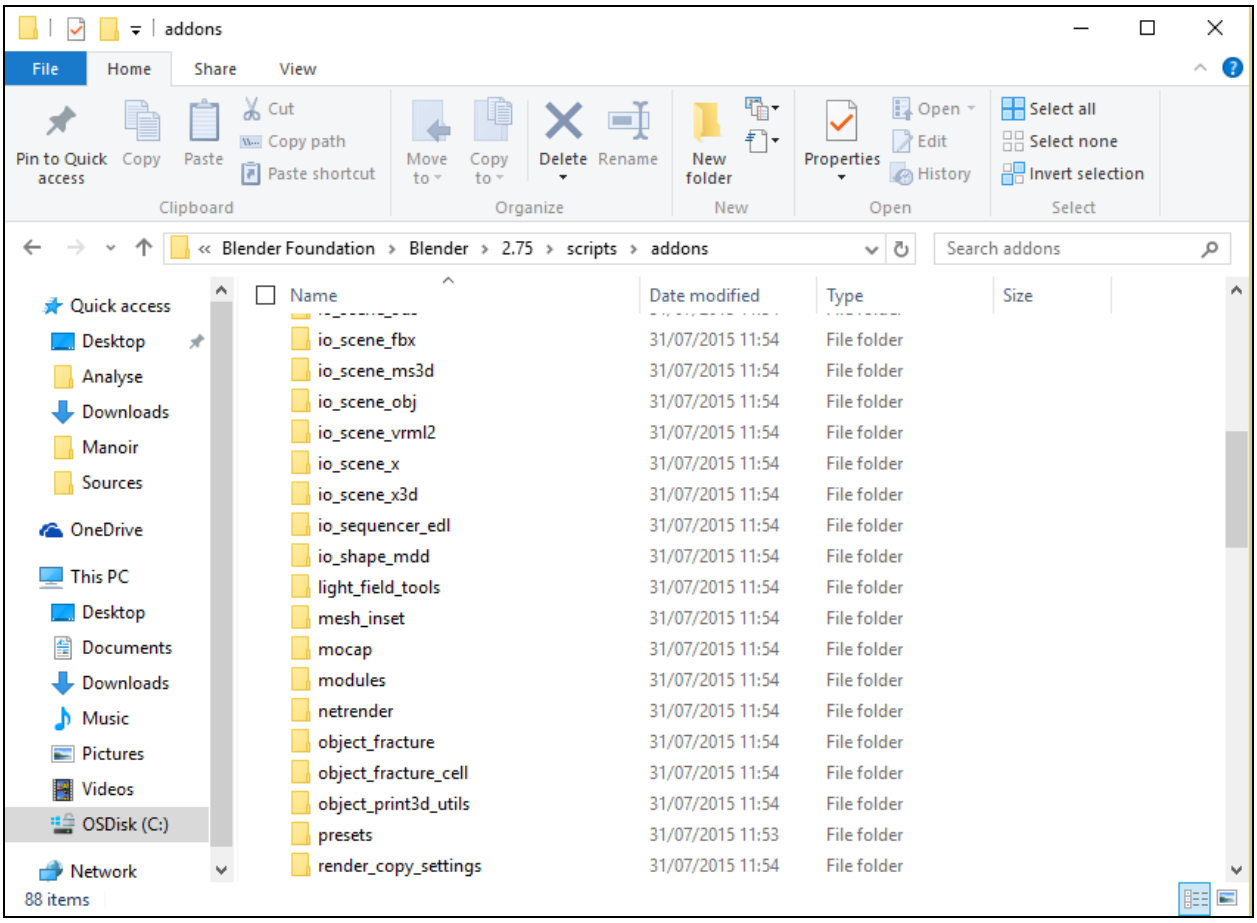


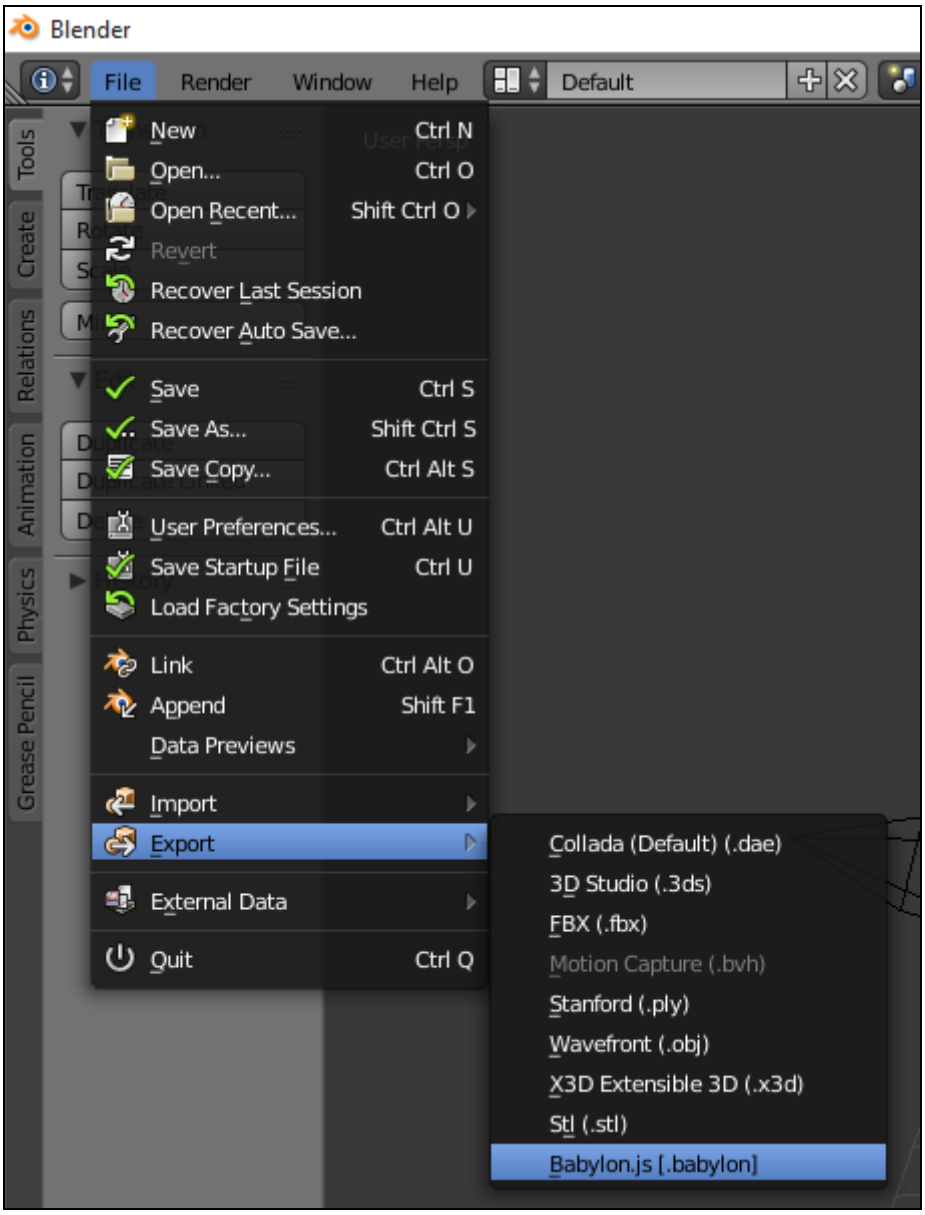


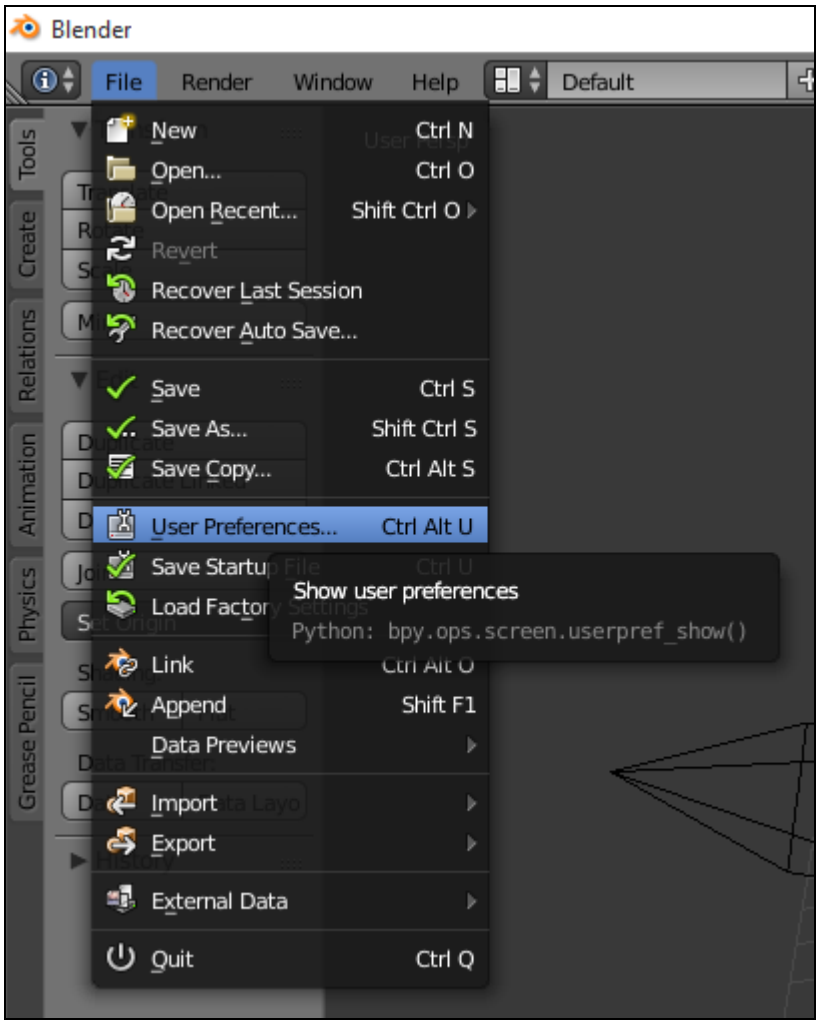


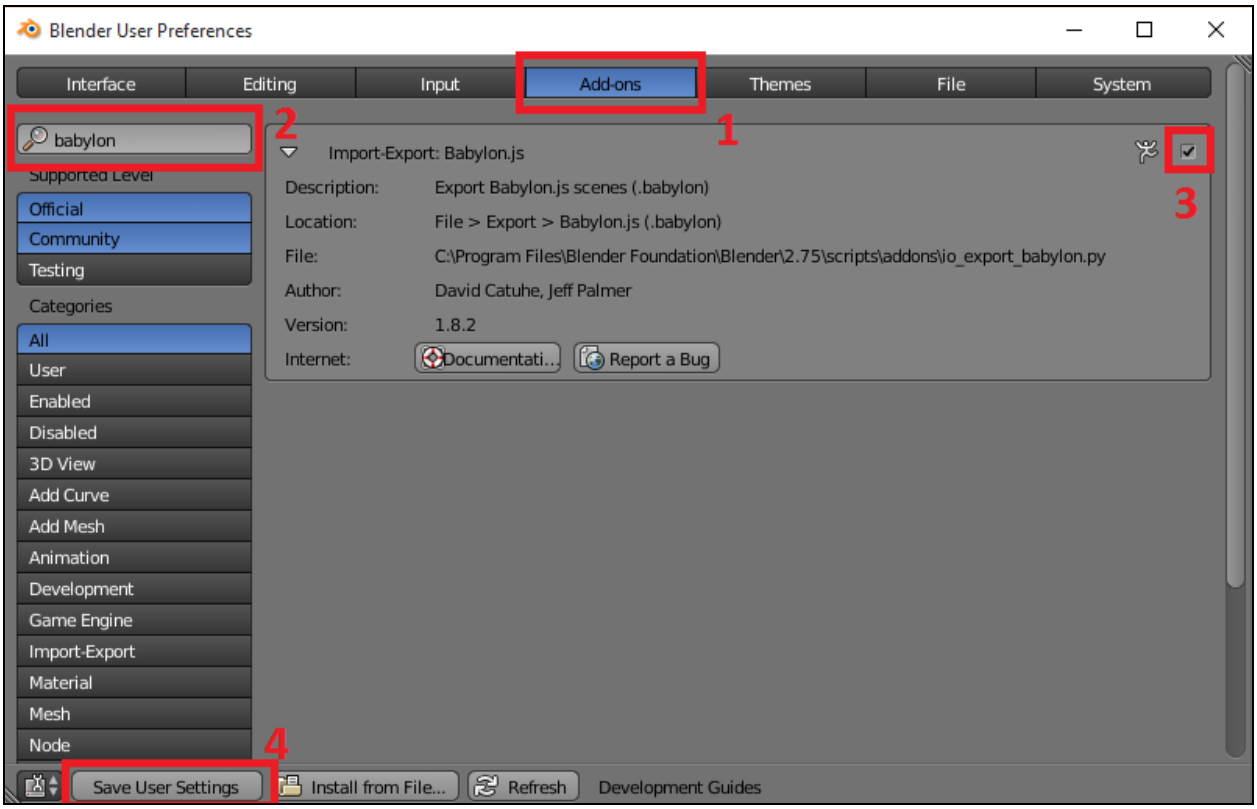

root (null)
Camera
...
Light
...
...
...

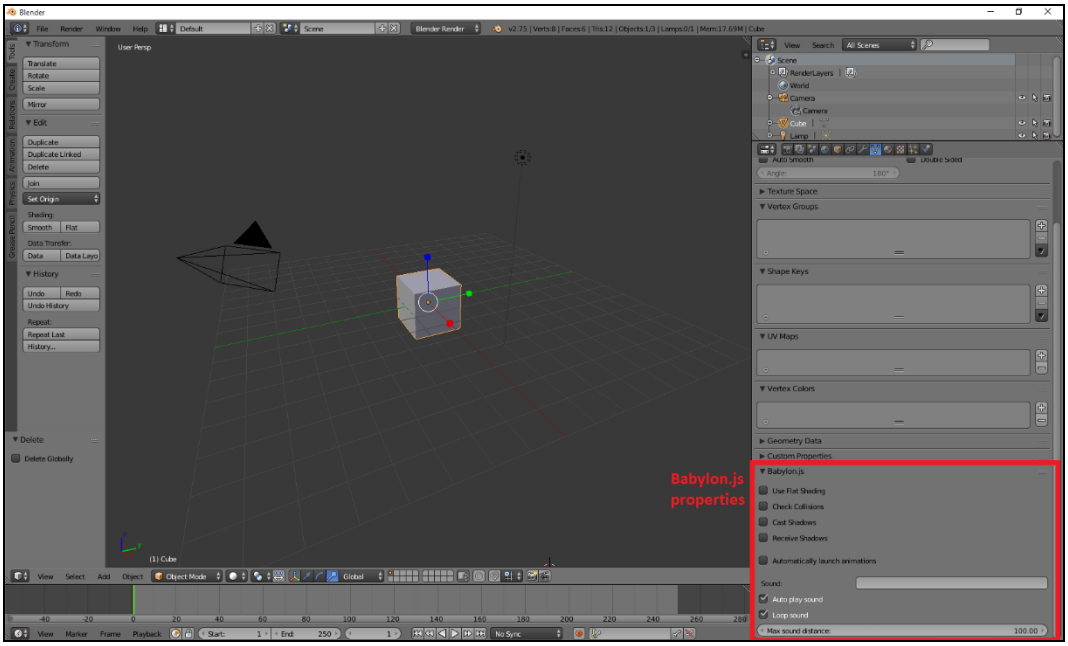
Chapter 3: Create, Load, and Draw 3D Objects on the Screen

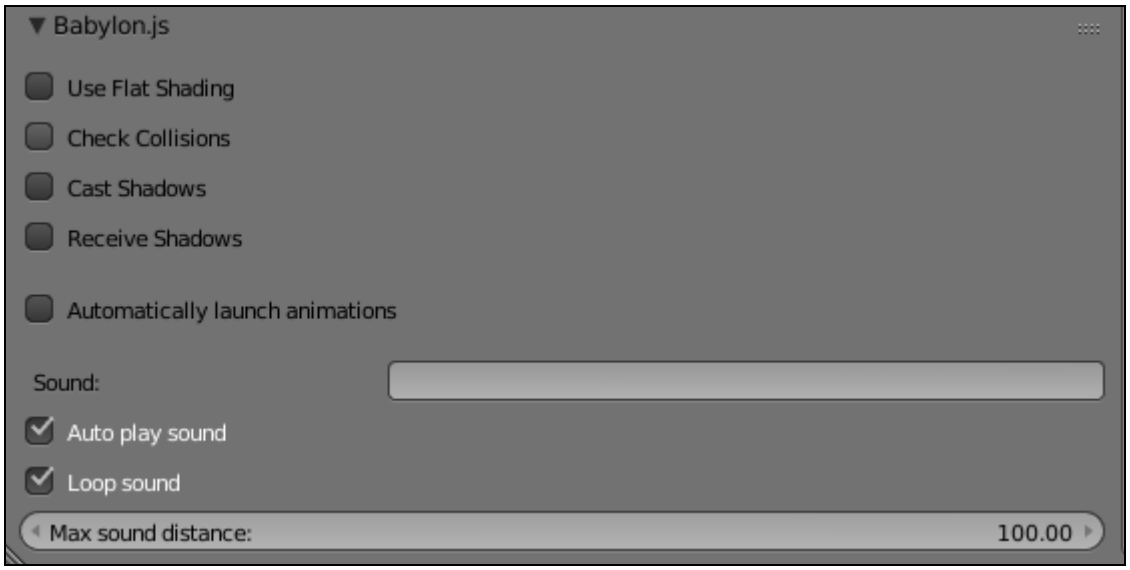


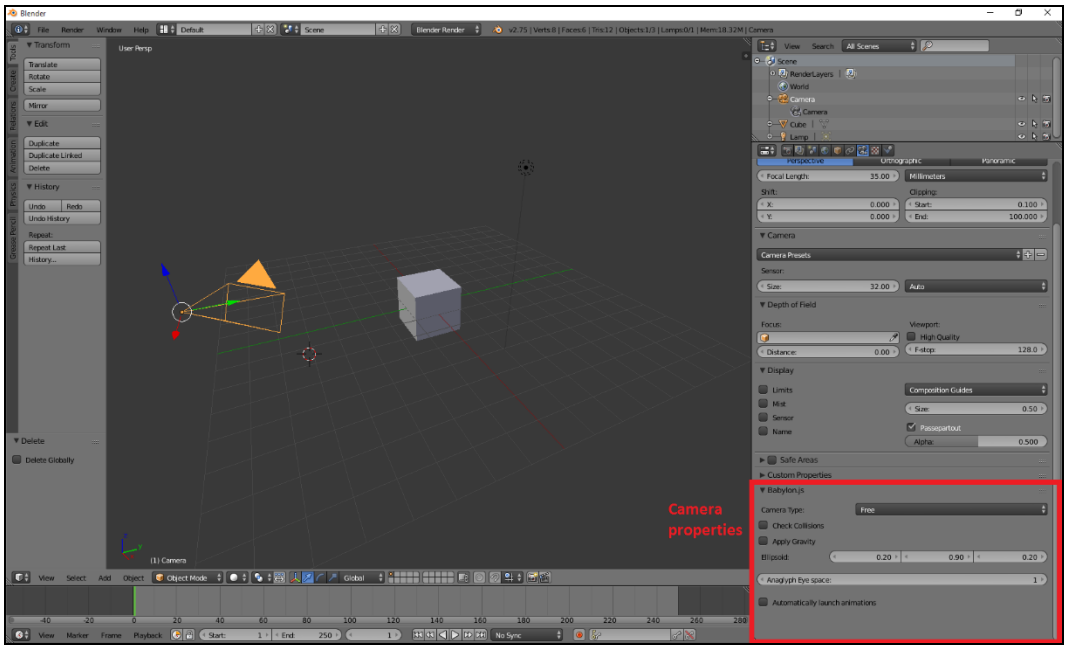

Blender
File
Render
Window
Help
Default
Tools
Create
Relations
Animation
Physics
Grease Pencil
New Ctrl N
Open... Ctrl O
Open Recent... Shift Ctrl O
Revert
Recover Last Session
Recover Auto Save...
Save Ctrl S
Save As... Shift Ctrl S
Save Copy... Ctrl Alt S
User Preferences... Ctrl Alt U
Save Startup File Ctrl U
Load Factory Settings
Link Ctrl Alt O
Append Shift F1
Data Previews
Import
Export
External Data
Quit Ctrl Q
Collada (Default) (.dae)
3D Studio (.3ds)
FBX (.fbx)
Motion Capture (.bvh)
Stanford (.ply)
Wavefront (.obj)
X3D Extensible 3D (.x3d)
Stl (.stl)
Babylon.js [.babylon]

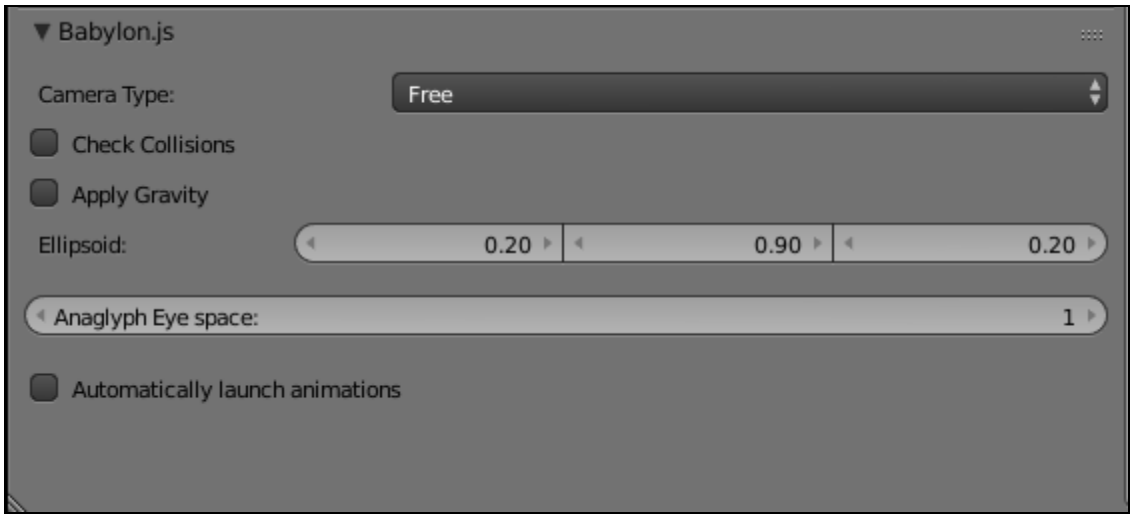

Blender
File
Render
Window
Help
Default
New Ctrl N
Open... Ctrl O
Open Recent... Shift Ctrl O
Revert
Recover Last Session
Recover Auto Save...
Save Ctrl S
Save As... Shift Ctrl S
Save Copy... Ctrl Alt S
User Preferences... Ctrl Alt U
Save Startu
Load Factor
Show user preferences
Python: bpy.ops.screen.userpref_show()
Link
Append Shift F1
Data Previews
Import
Export
External Data
Quit Ctrl Q
Tools
Create
Relations
Animation
Physics
Grease Pencil

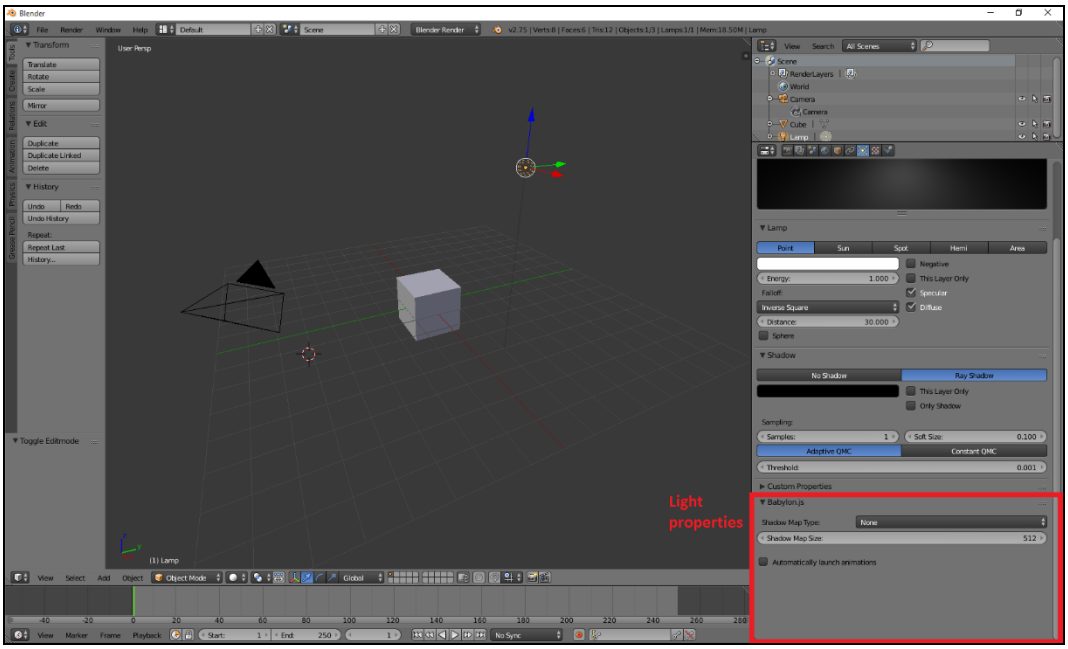

Blender User Preferences
Interface
Editing
Input
Add-ons
Themes
File
System
babylon
2
1
Supported Level
Official
Community
Testing
Categories
All
User
Enabled
Disabled
3D View
Add Curve
Add Mesh
Animation
Development
Game Engine
Import-Export
Material
Mesh
Node
Import-Export: Babylon.js
3
Description: Export Babylon.js scenes (.babylon)
Location: File > Export > Babylon.js (.babylon)
File: C:\Program Files\Blender Foundation\Blender\2.75\scripts\addons\io_export_babylon.py
Author: David Catuhe, Jeff Palmer
Version: 1.8.2
Internet: Documentati... Report a Bug
4
Save User Settings
Install from File...
Refresh
Development Guides

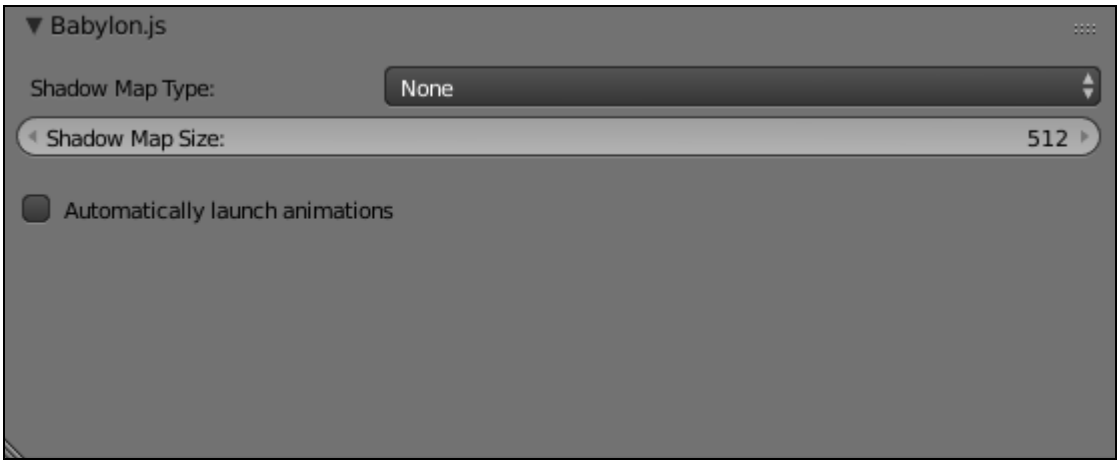

Babylon.js properties

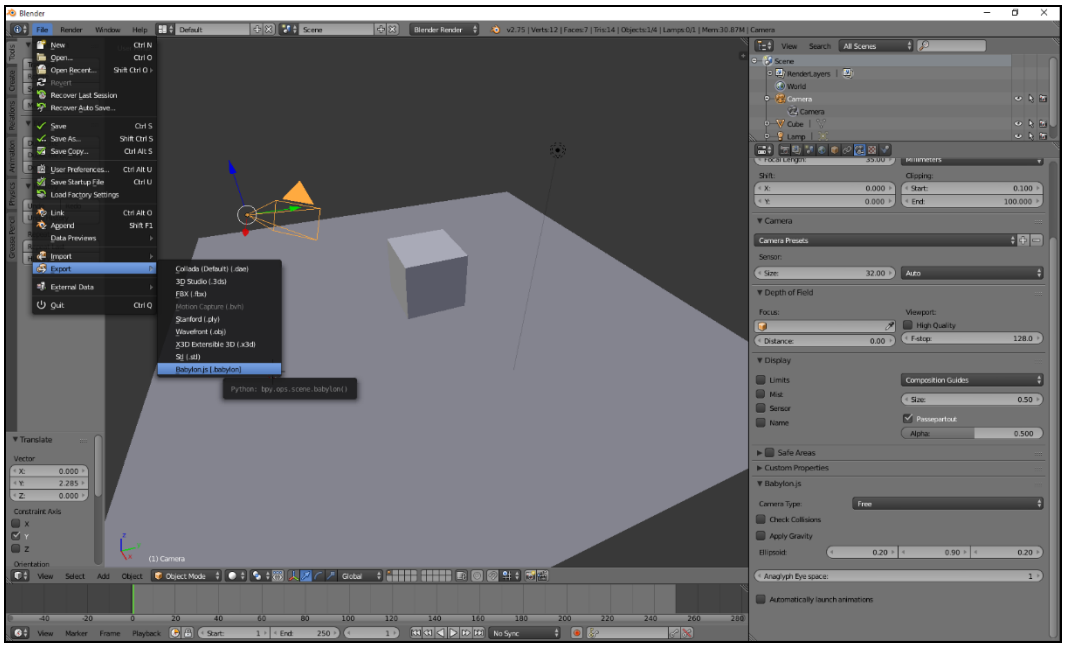

Babylon.js
Use Flat Shading
Check Collisions
Cast Shadows
Receive Shadows
Automatically launch animations
Sound:
Auto play sound
Loop sound
Max sound distance:
100.00

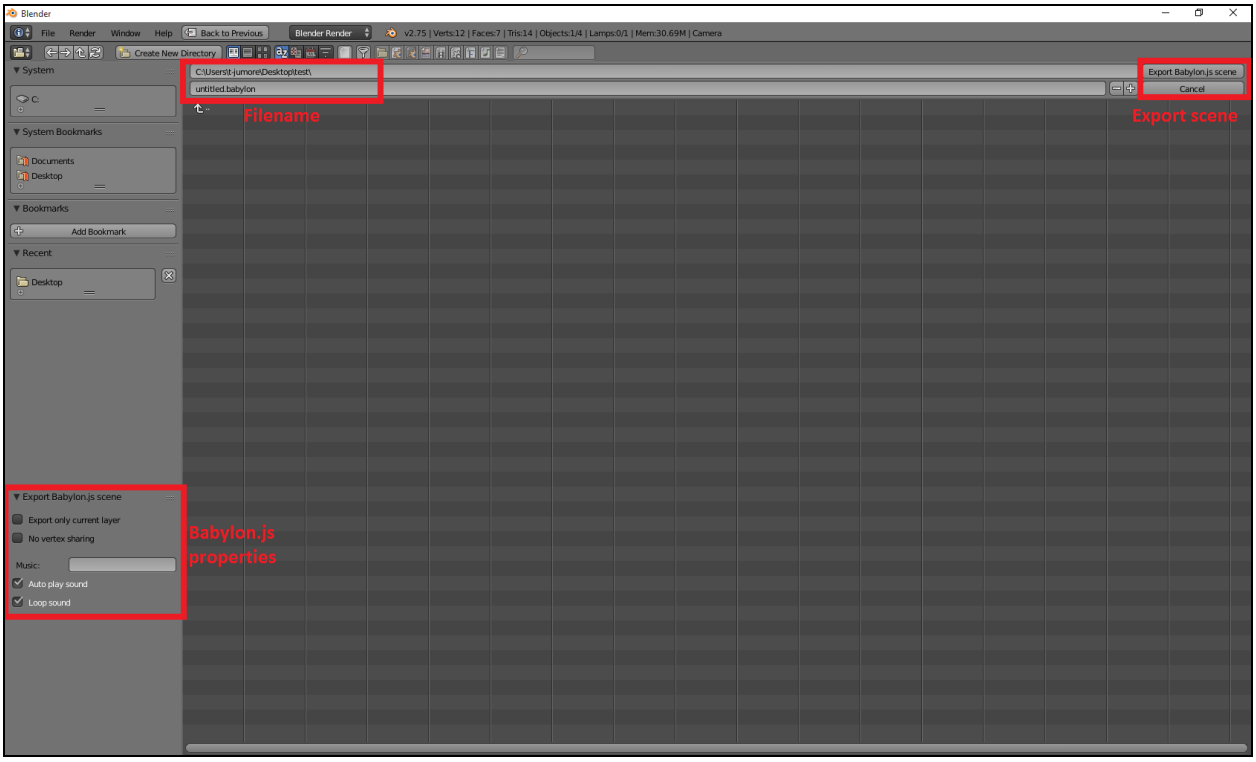

Camera properties

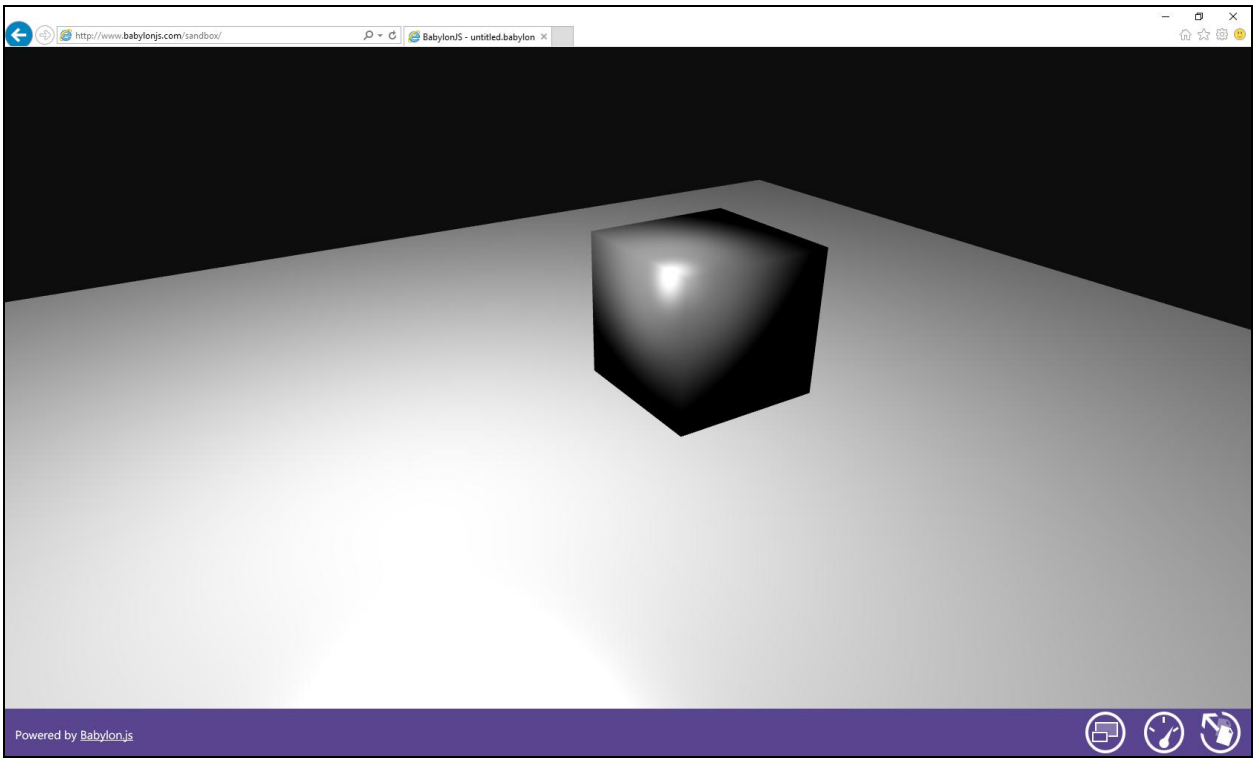

Babylon.js
Camera Type:
Free
Check Collisions
Apply Gravity
Ellipsoid:
0.20
0.90
0.20
Anaglyph Eye space:
1
Automatically launch animations

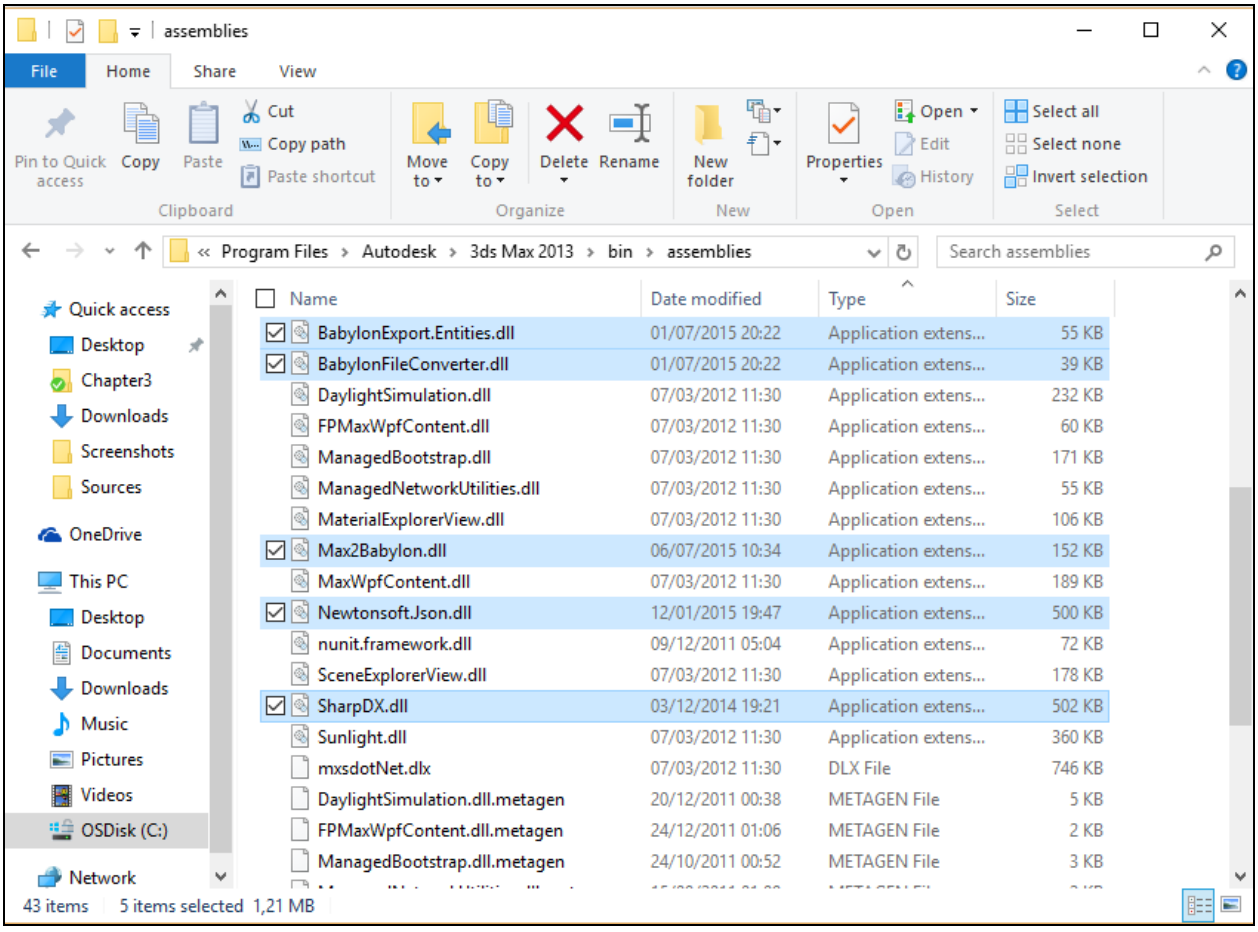

Light properties

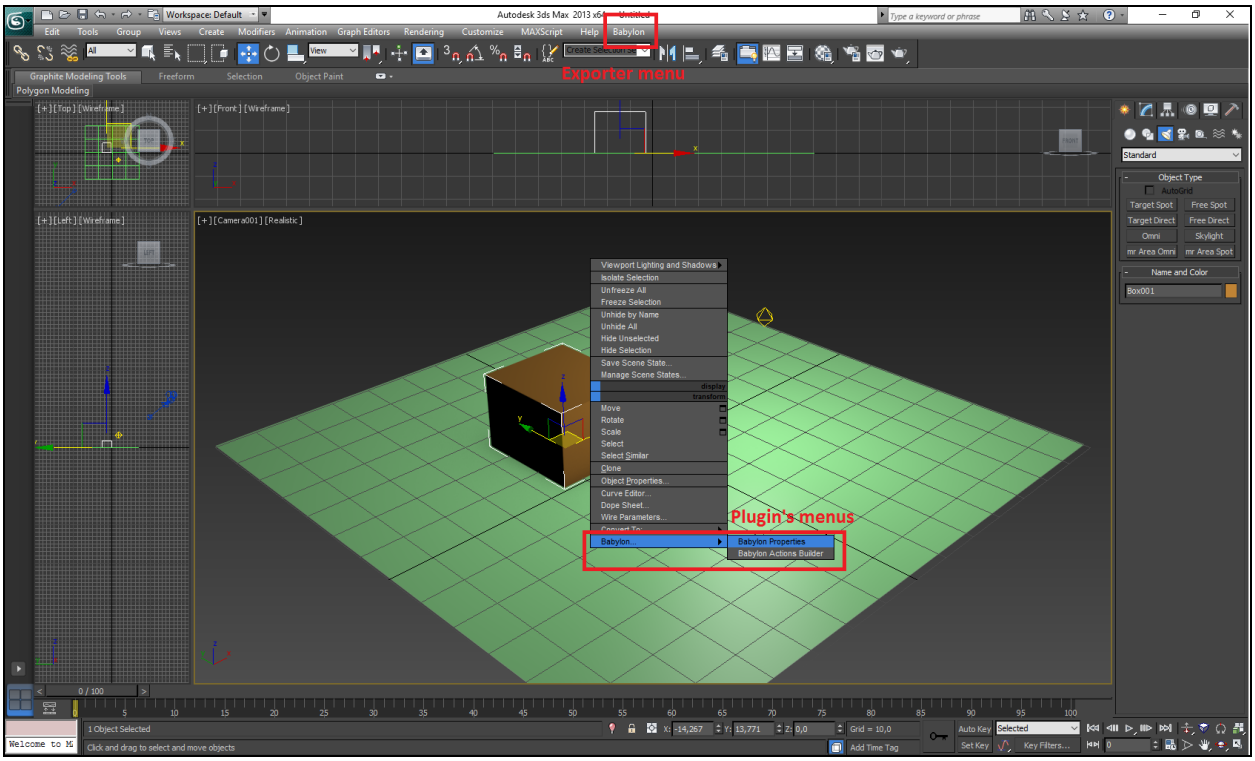

Babylon.js
Shadow Map Type:
None
Shadow Map Size:
512
Automatically launch animations

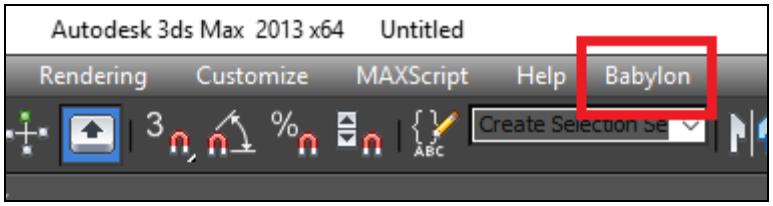


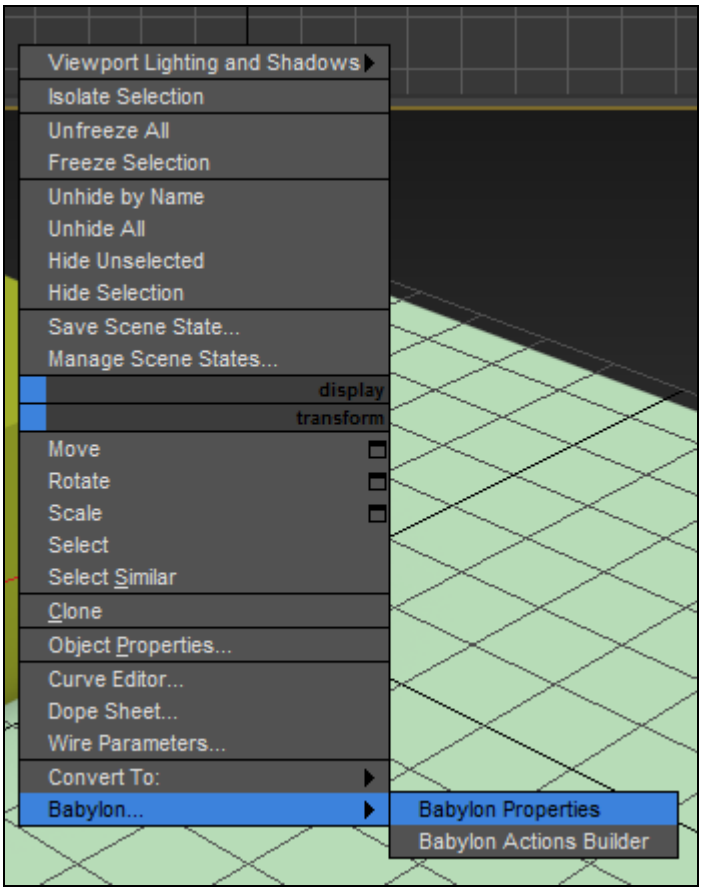

Filename
Export scene
Babylon.js
properties

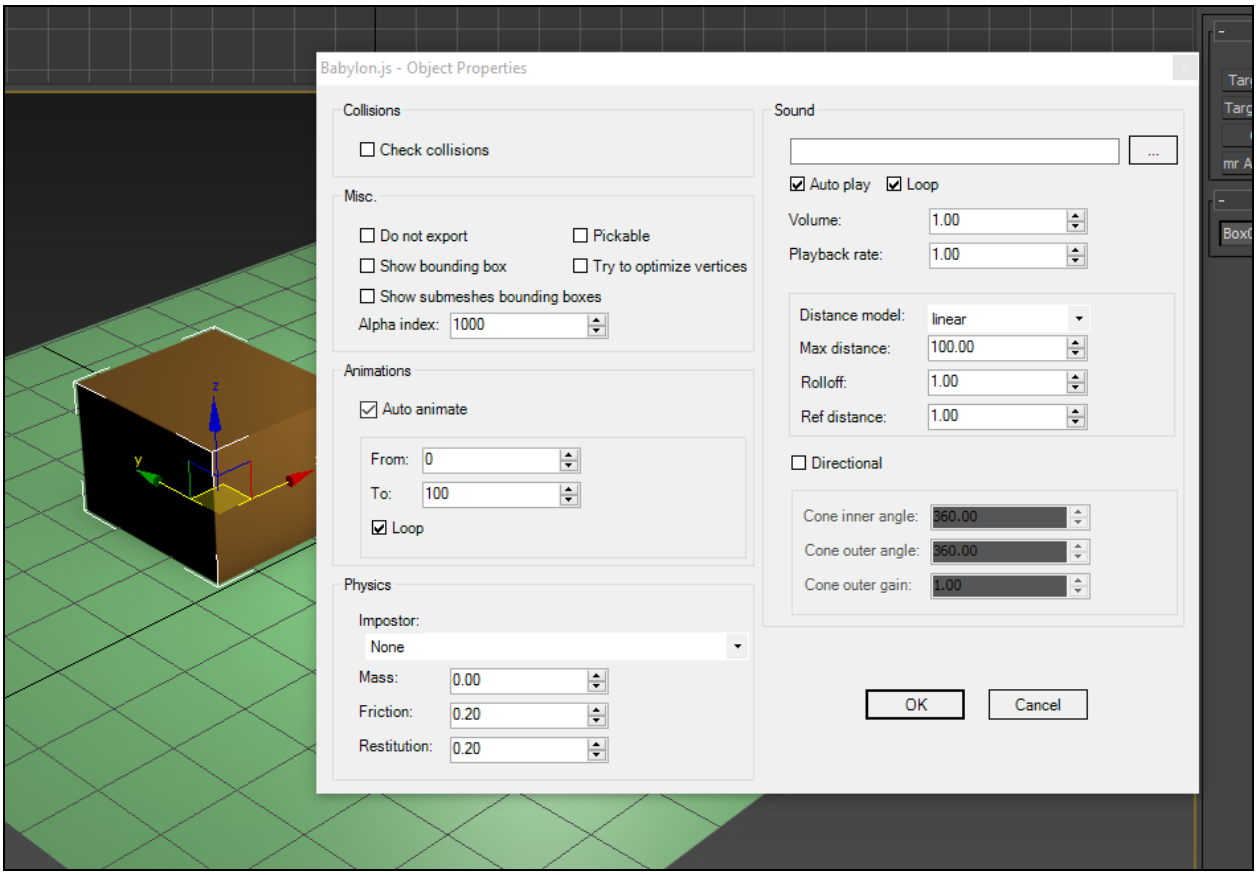

http://www.babylonjs.com/sandbox/
BabylonJS - untitled.babylon
Powered by Babylon.js

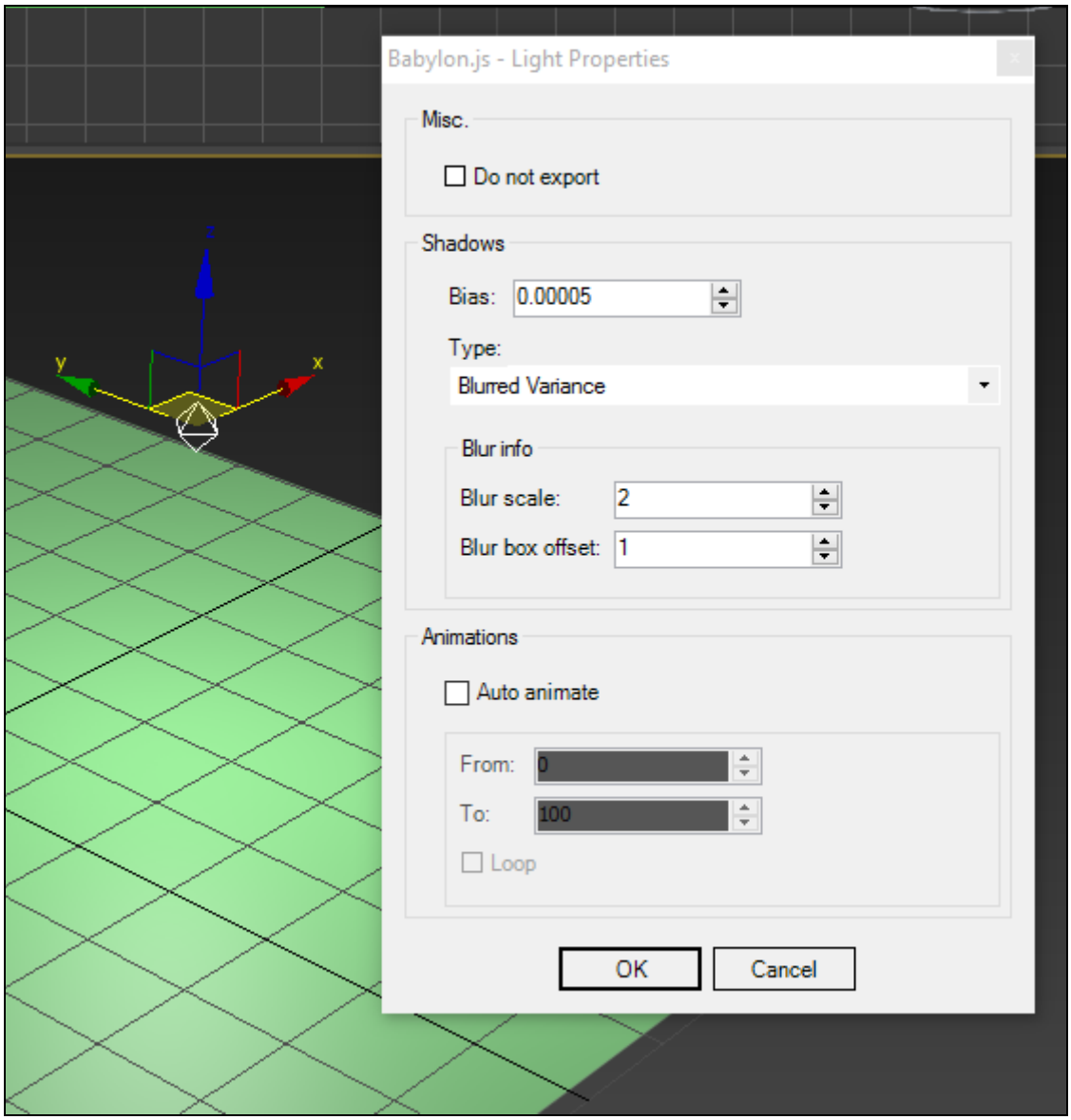

assemblies
File
Home
Share
View
Pin to Quick access
Copy
Paste
Cut
Copy path
Paste shortcut
Clipboard
Move to
Copy to
Delete
Rename
Organize
New folder
New
Properties
Open
Edit
History
Open
Select all
Select none
Invert selection
Select
« Program Files › Autodesk › 3ds Max 2013 › bin › assemblies
Search assemblies
Quick access
Desktop
Chapter3
Downloads
Screenshots
Sources
OneDrive
This PC
Desktop
Documents
Downloads
Music
Pictures
Videos
OSDisk (C:)
Network
Name
Date modified
Type
Size
BabylonExport.Entities.dll 01/07/2015 20:22 Application extens... 55 KB
BabylonFileConverter.dll 01/07/2015 20:22 Application extens... 39 KB
DaylightSimulation.dll 07/03/2012 11:30 Application extens... 232 KB
FPMaxWpfContent.dll 07/03/2012 11:30 Application extens... 60 KB
ManagedBootstrap.dll 07/03/2012 11:30 Application extens... 171 KB
ManagedNetworkUtilities.dll 07/03/2012 11:30 Application extens... 55 KB
MaterialExplorerView.dll 07/03/2012 11:30 Application extens... 106 KB
Max2Babylon.dll 06/07/2015 10:34 Application extens... 152 KB
MaxWpfContent.dll 07/03/2012 11:30 Application extens... 189 KB
Newtonsoft.Json.dll 12/01/2015 19:47 Application extens... 500 KB
nunit.framework.dll 09/12/2011 05:04 Application extens... 72 KB
SceneExplorerView.dll 07/03/2012 11:30 Application extens... 178 KB
SharpDX.dll 03/12/2014 19:21 Application extens... 502 KB
Sunlight.dll 07/03/2012 11:30 Application extens... 360 KB
mxsdotNet.dlx 07/03/2012 11:30 DLX File 746 KB
DaylightSimulation.dll.metagen 20/12/2011 00:38 METAGEN File 5 KB
FPMaxWpfContent.dll.metagen 24/12/2011 01:06 METAGEN File 2 KB
ManagedBootstrap.dll.metagen 24/10/2011 00:52 METAGEN File 3 KB
43 items
5 items selected 1,21 MB

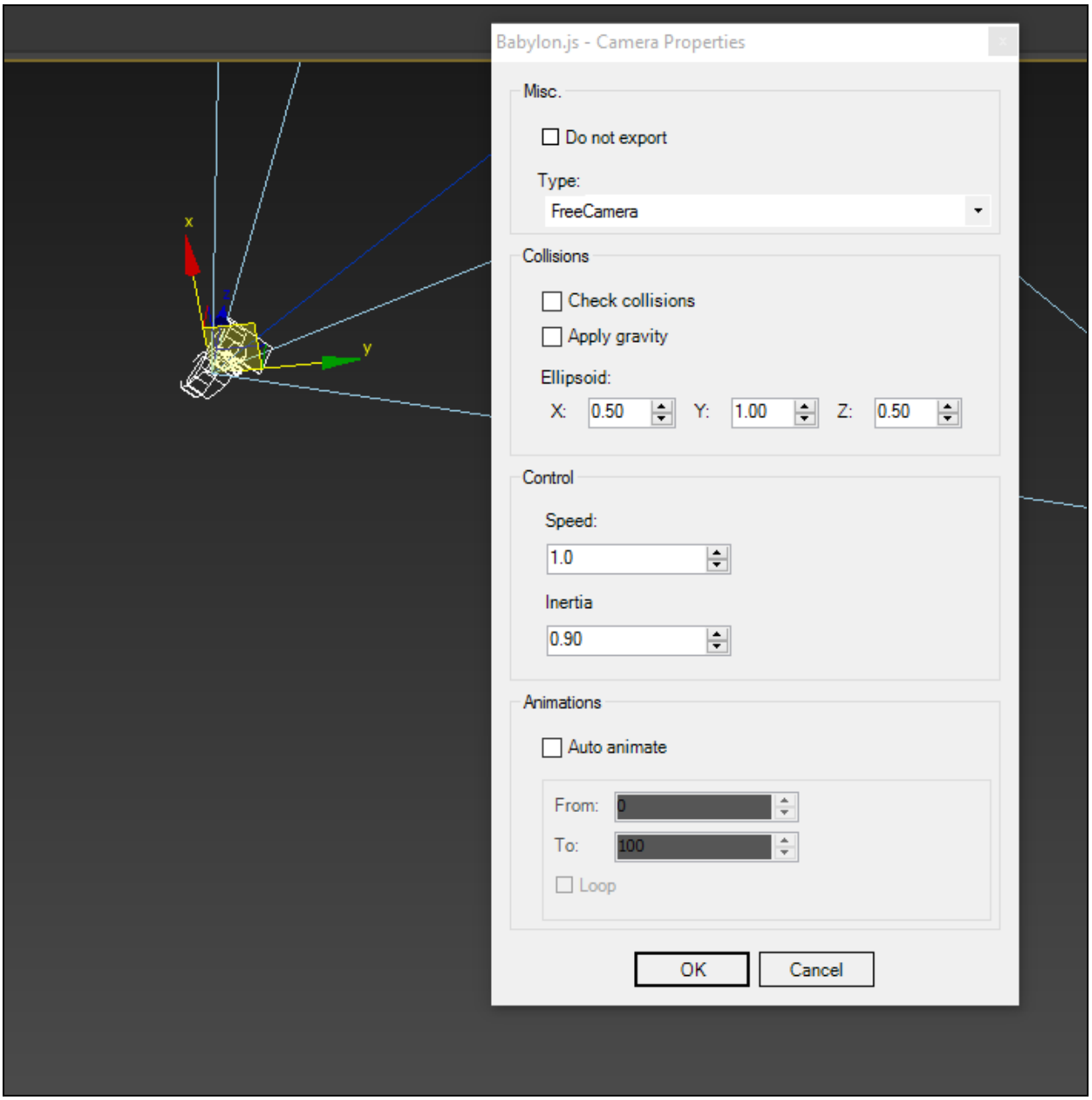

Exporter menu
Plugin's menus
Babylon Properties
Babylon Actions Builder

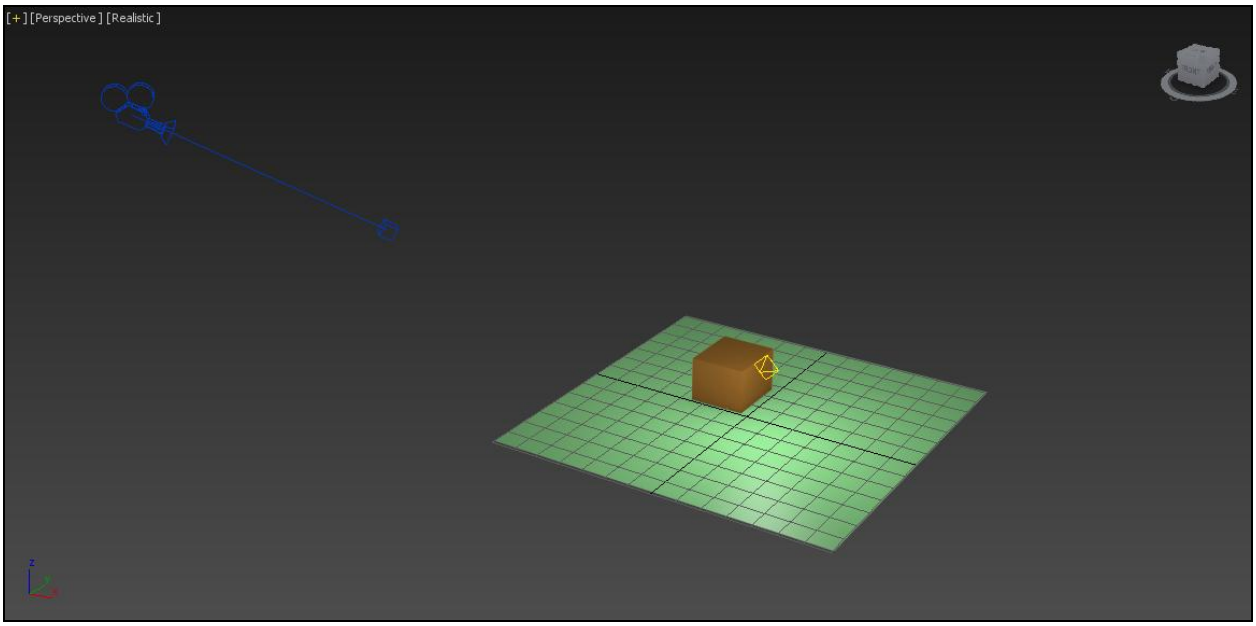

Autodesk 3ds Max 2013 x64 Untitled
Rendering
Customize
MAXScript
Help
Babylon

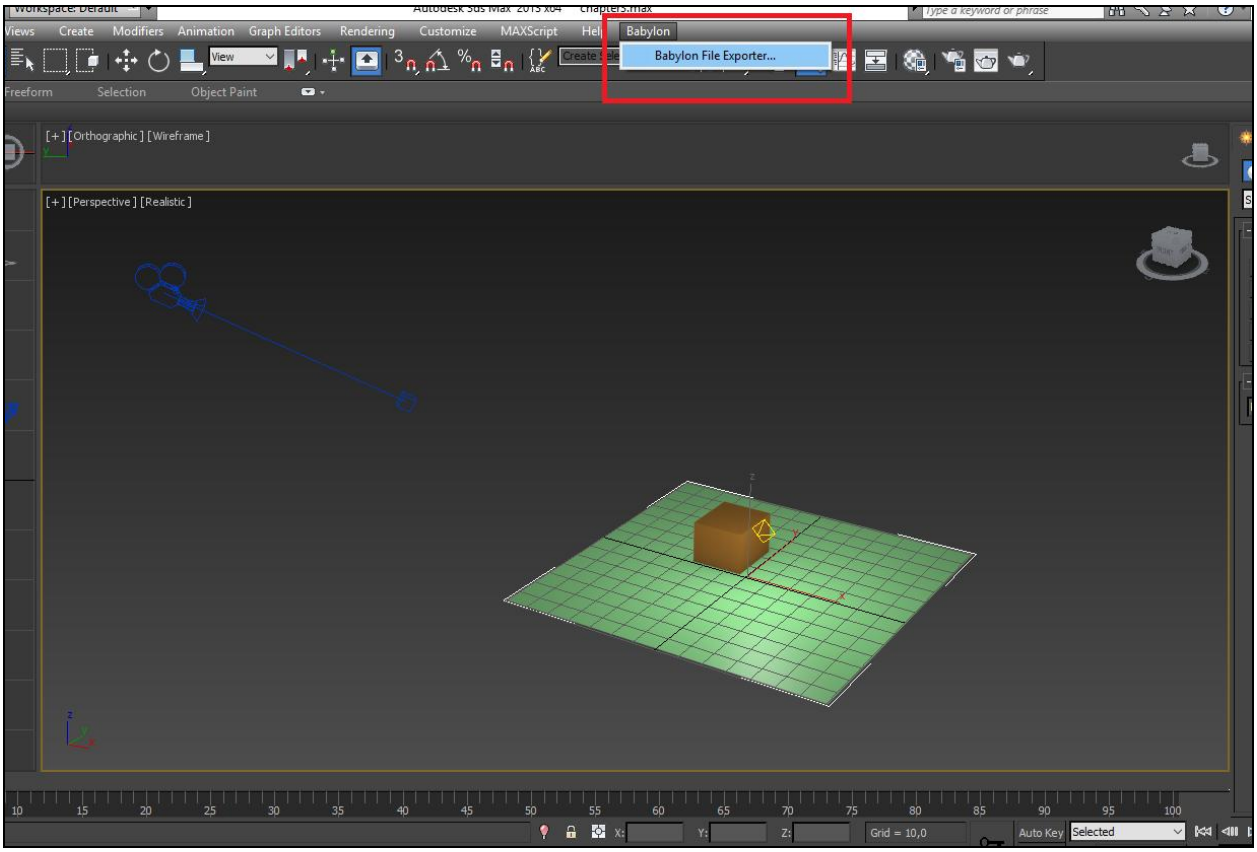

Viewport Lighting and Shadows
Isolate Selection
Unfreeze All
Freeze Selection
Unhide by Name
Unhide All
Hide Unselected
Hide Selection
Save Scene State...
Manage Scene States...
display
transform
Move
Rotate
Scale
Select
Select Similar
Clone
Object Properties...
Curve Editor...
Dope Sheet...
Wire Parameters...
Convert To:
Babylon...
Babylon Properties
Babylon Actions Builder

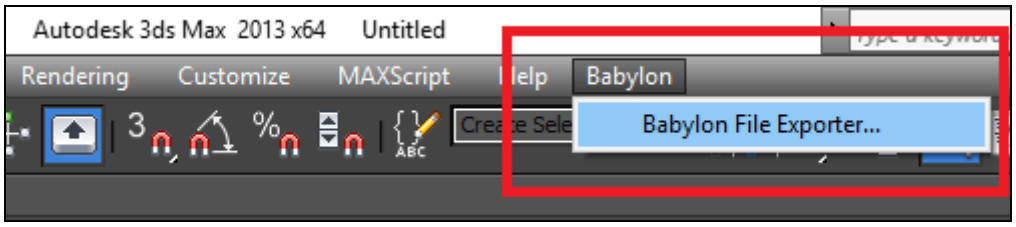

Babylon.js - Object Properties
Collisions
Check collisions
Misc.
Do not export
Pickable
Show bounding box
Try to optimize vertices
Show submeshes bounding boxes
Alpha index: 1000
Animations
Auto animate
From: 0
To: 100
Loop
Physics
Impostor:
None
Mass: 0.00
Friction: 0.20
Restitution: 0.20
Sound
...
Auto play
Loop
Volume: 1.00
Playback rate: 1.00
Distance model: linear
Max distance: 100.00
Rolloff: 1.00
Ref distance: 1.00
Directional
Cone inner angle: 360.00
Cone outer angle: 360.00
Cone outer gain: 1.00
OK
Cancel

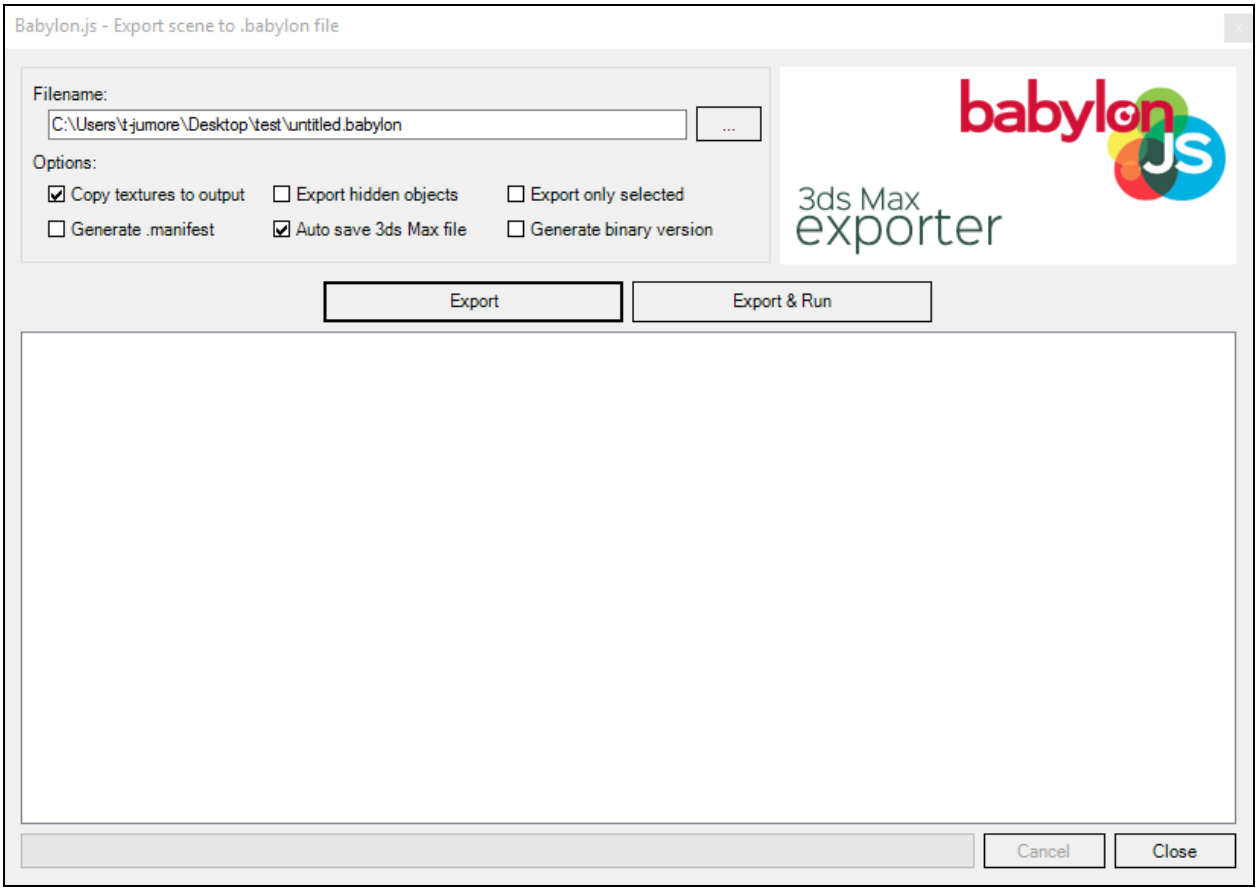

Babylon.js - Light Properties
Misc.
Do not export
Shadows
Bias:
0.00005
Type:
Blurred Variance
Blur info
Blur scale:
2
Blur box offset:
1
Animations
Auto animate
From:
0
To:
100
Loop
OK
Cancel
z
y
x

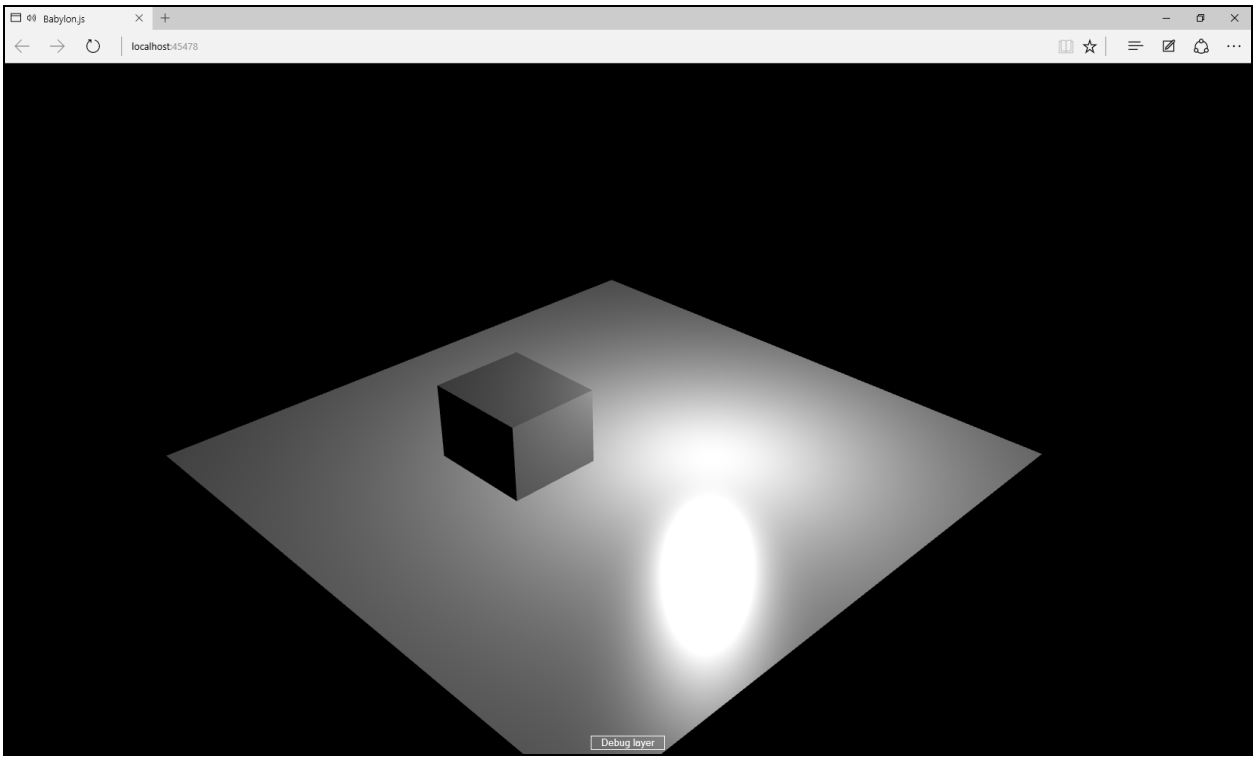

Babylon.js - Camera Properties
Misc.
Do not export
Type:
FreeCamera
Collisions
Check collisions
Apply gravity
Ellipsoid:
X: 0.50
Y: 1.00
Z: 0.50
Control
Speed:
1.0
Inertia
0.90
Animations
Auto animate
From: 0
To: 100
Loop
OK
Cancel
x
y


[+] [Perspective] [Realistic]

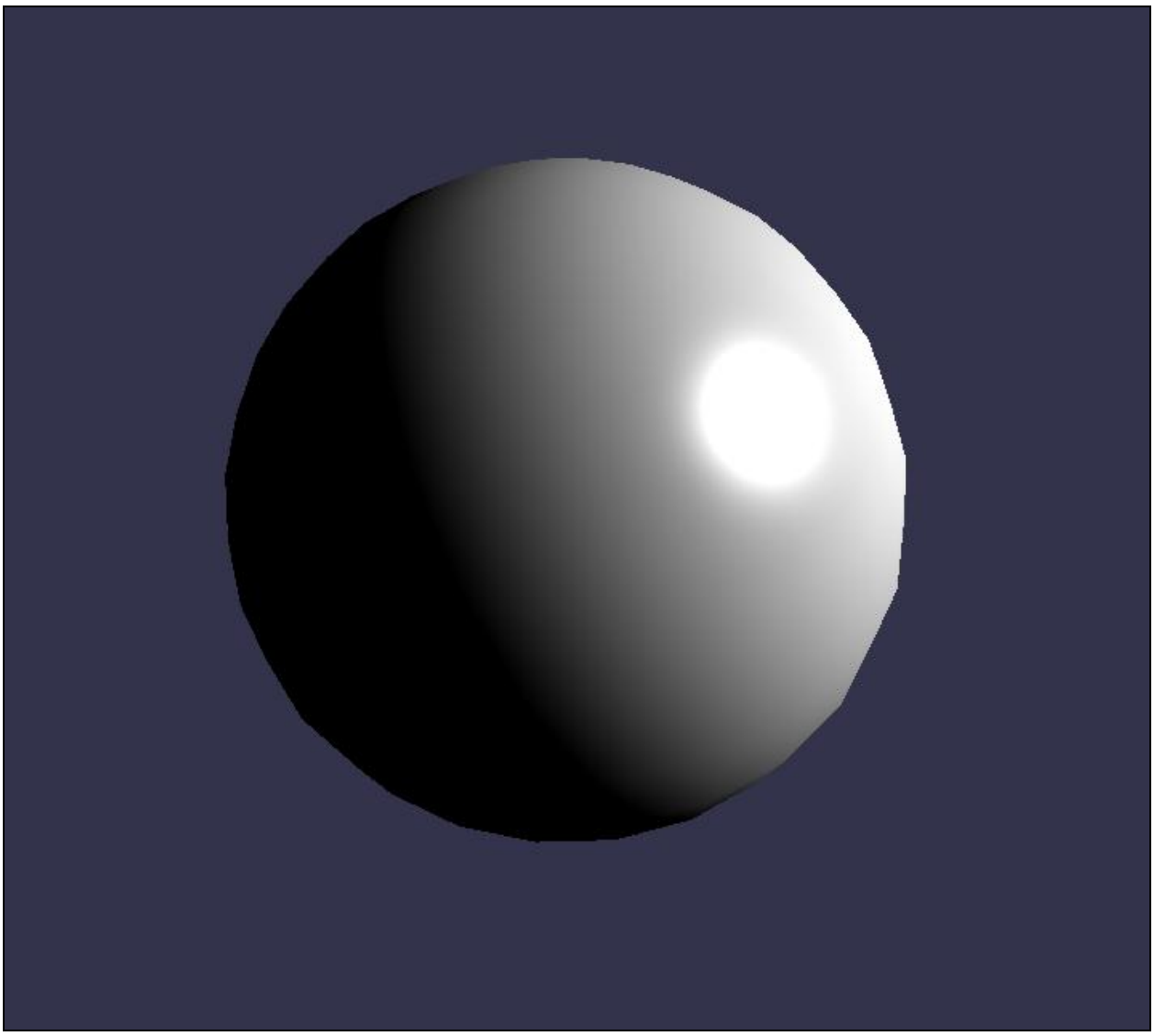

Views
Create
Modifiers
Animation
Graph Editors
Rendering
Customize
MAXScript
Babylon
Babylon File Exporter...
View
Freeform
Selection
Object Paint
[+] [Orthographic] [Wireframe]
[+] [Perspective] [Realistic]
Grid = 10,0
Auto Key
Selected

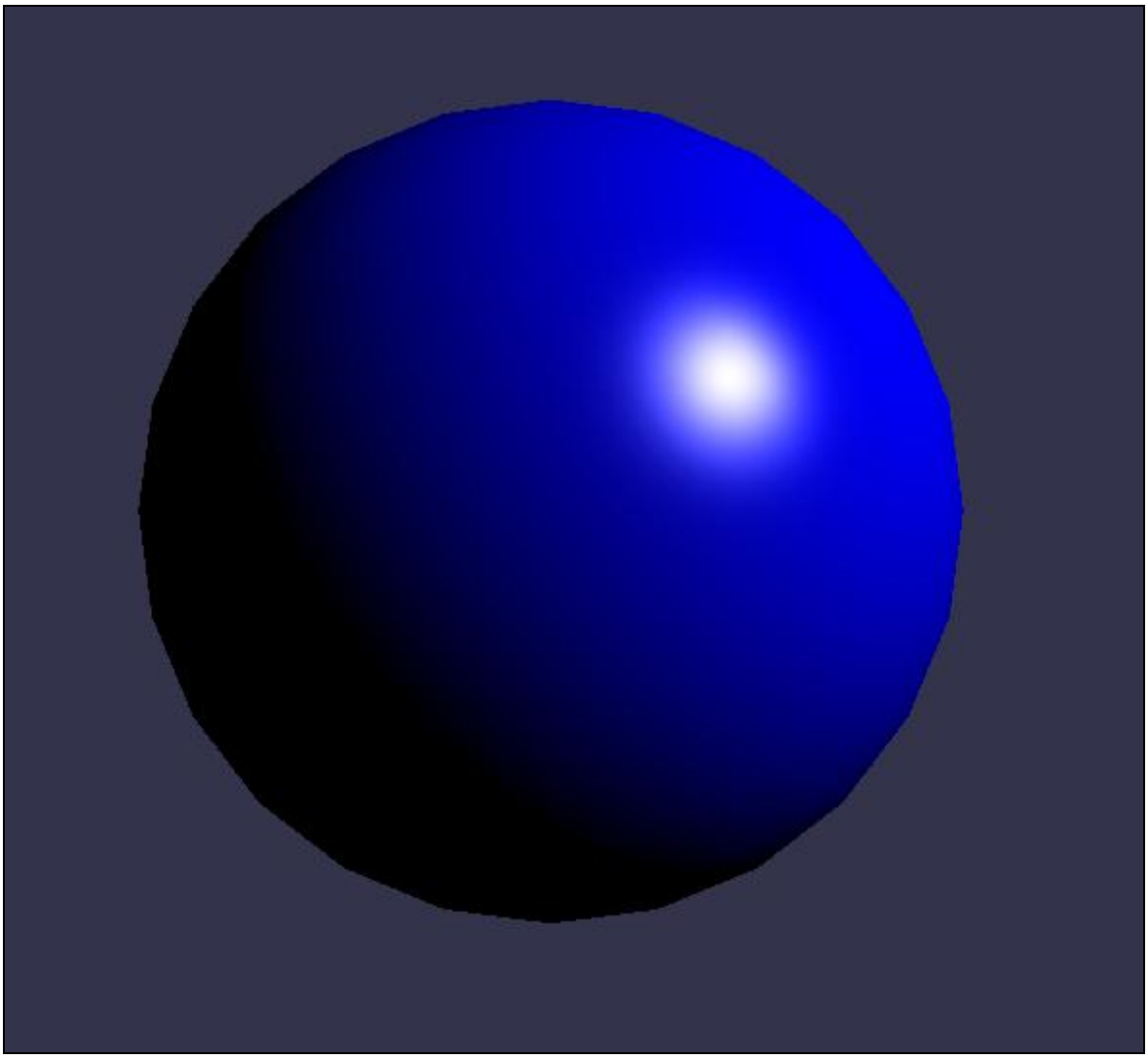

Autodesk 3ds Max 2013 x64 Untitled
Rendering
Customize
MAXScript
Babylon
Babylon File Exporter...

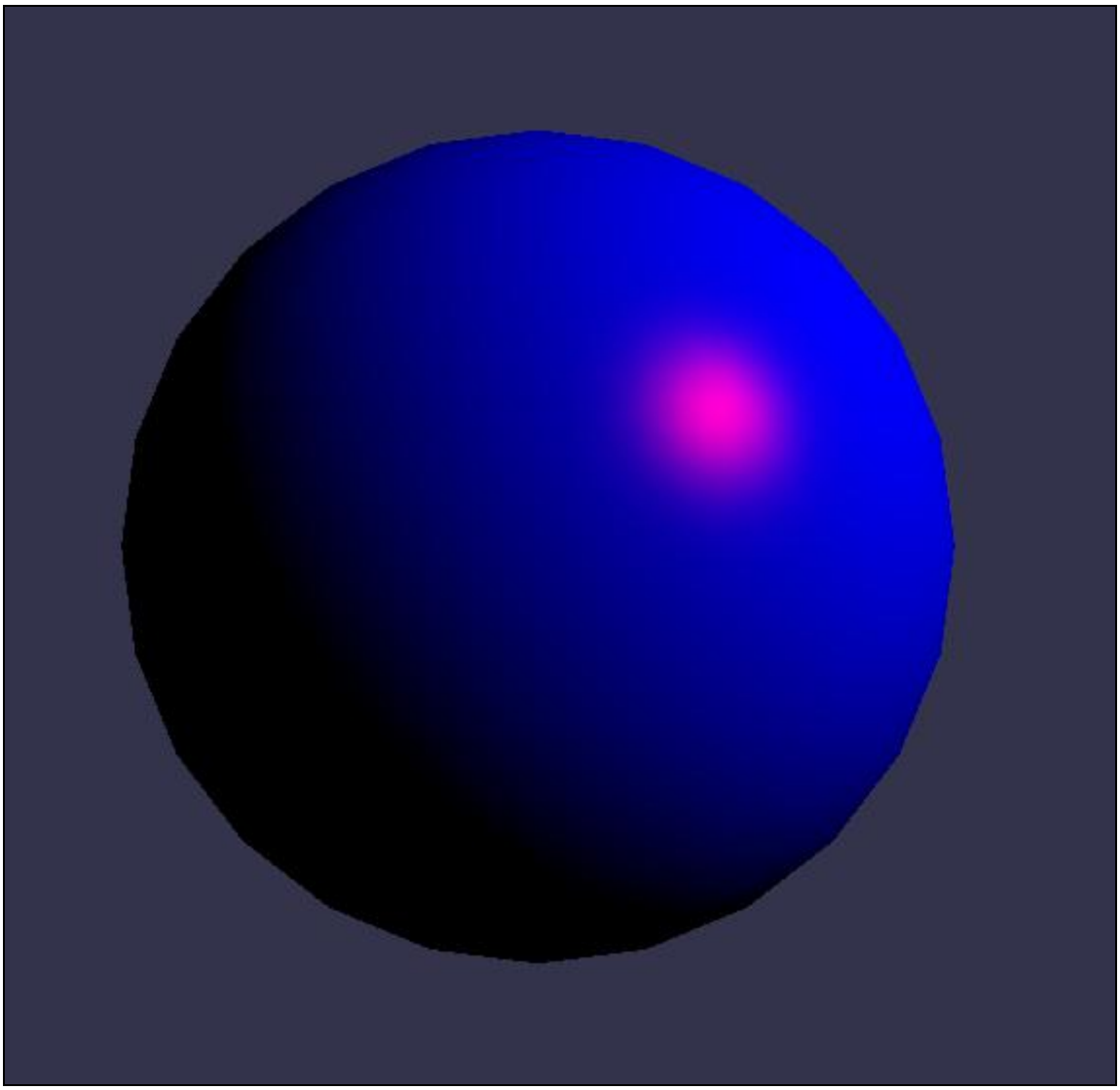

Babylon.js - Export scene to .babylon file
Filename:
C:\Users\t-jumore\Desktop\test\untitled.babylon
...
Options:
Copy textures to output
Export hidden objects
Export only selected
Generate .manifest
Auto save 3ds Max file
Generate binary version
babylon JS
3ds Max exporter
Export
Export & Run
Cancel
Close

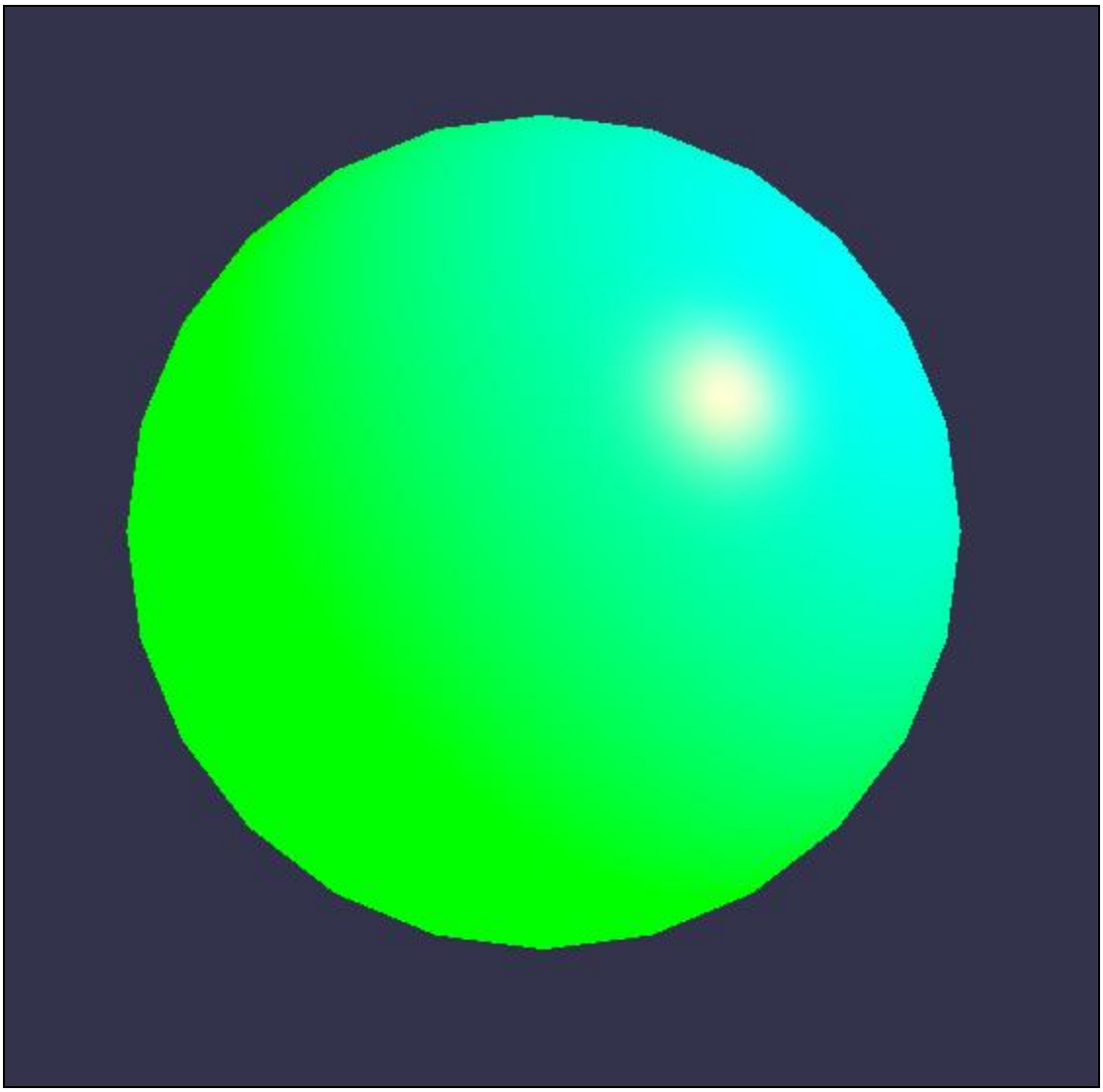

Babylon.js
localhost:45478
Debug layer

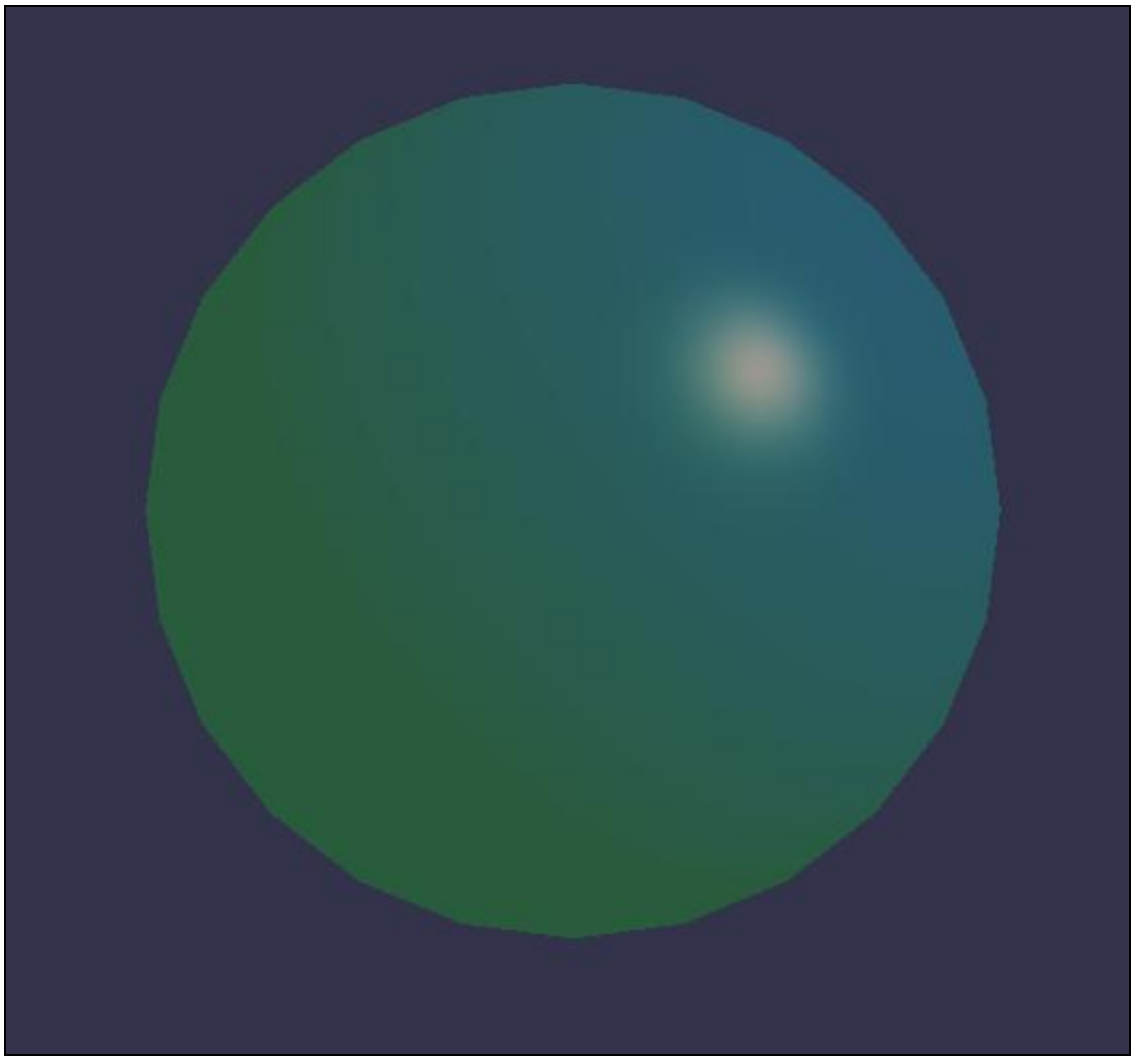
Chapter 4: Using Materials to Customize 3D Objects Appearance

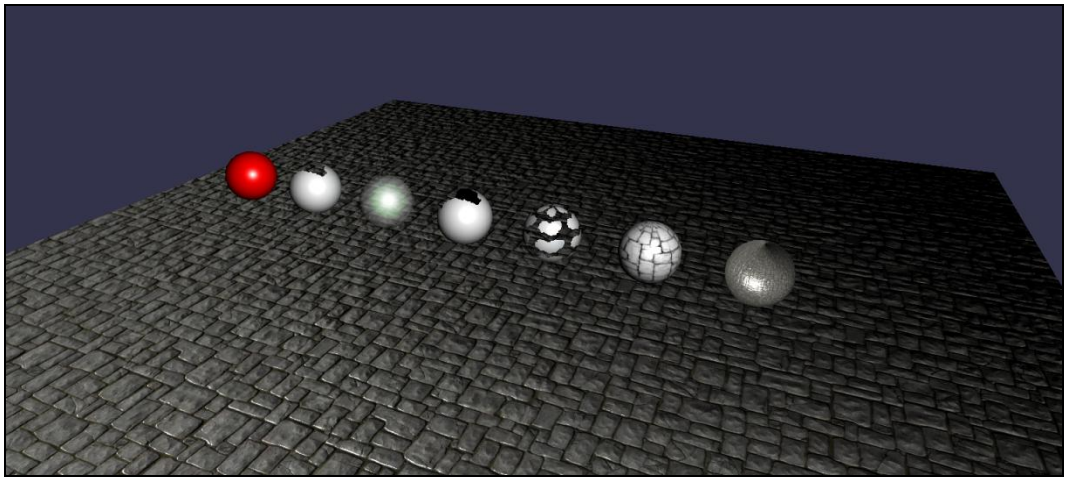


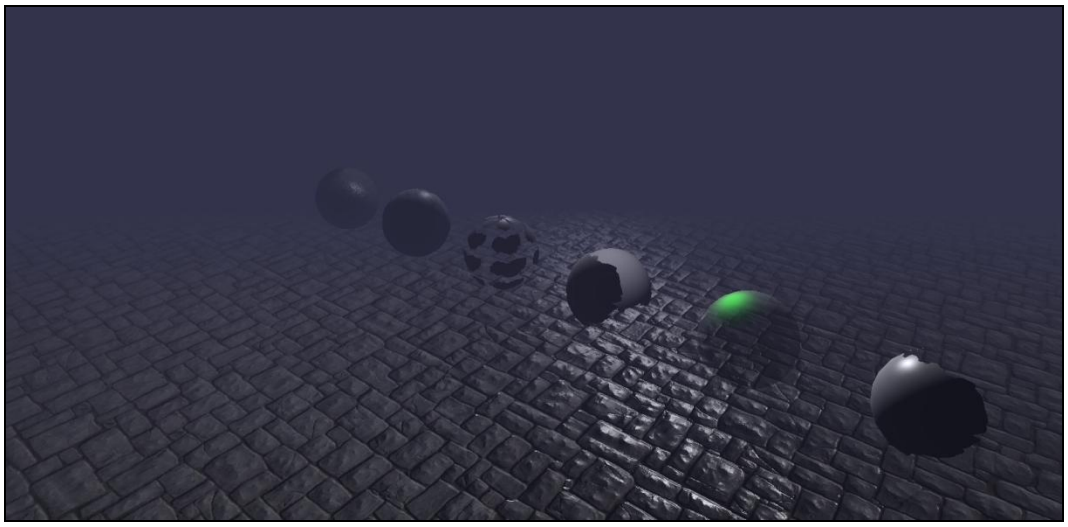


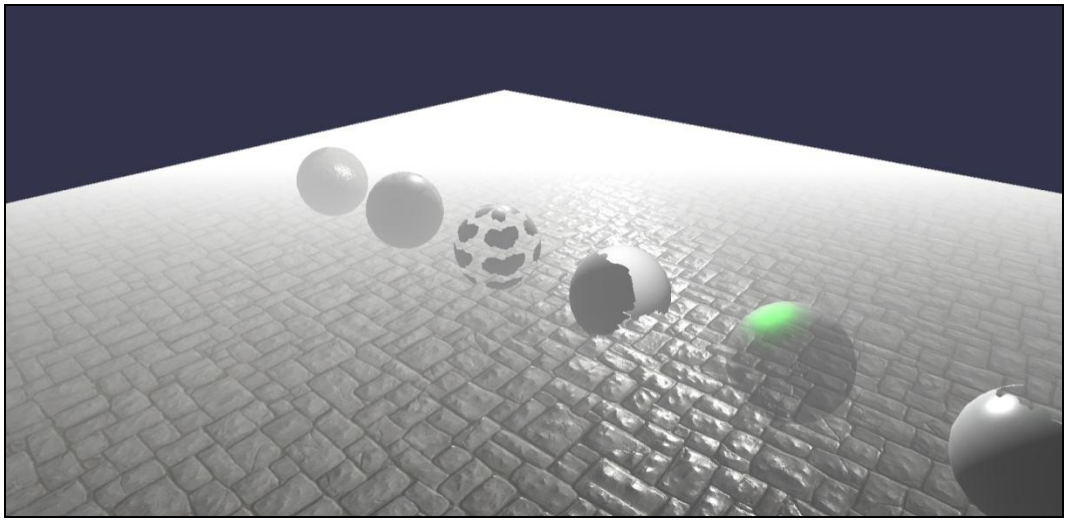


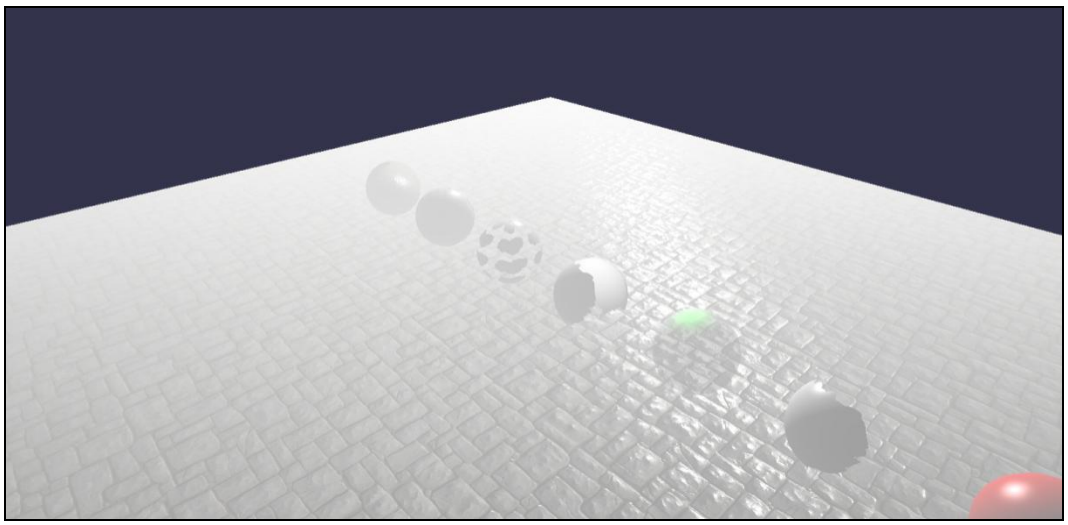


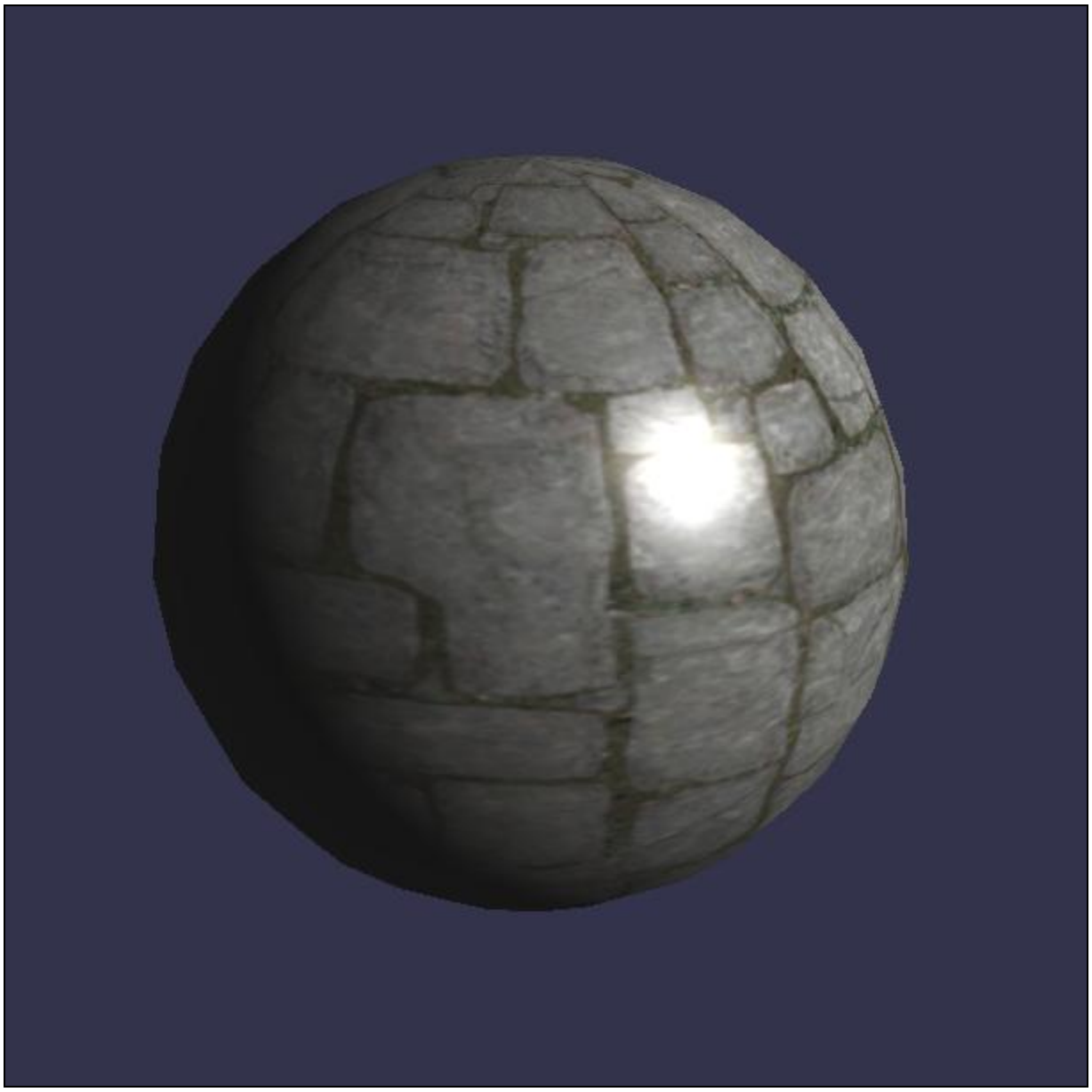


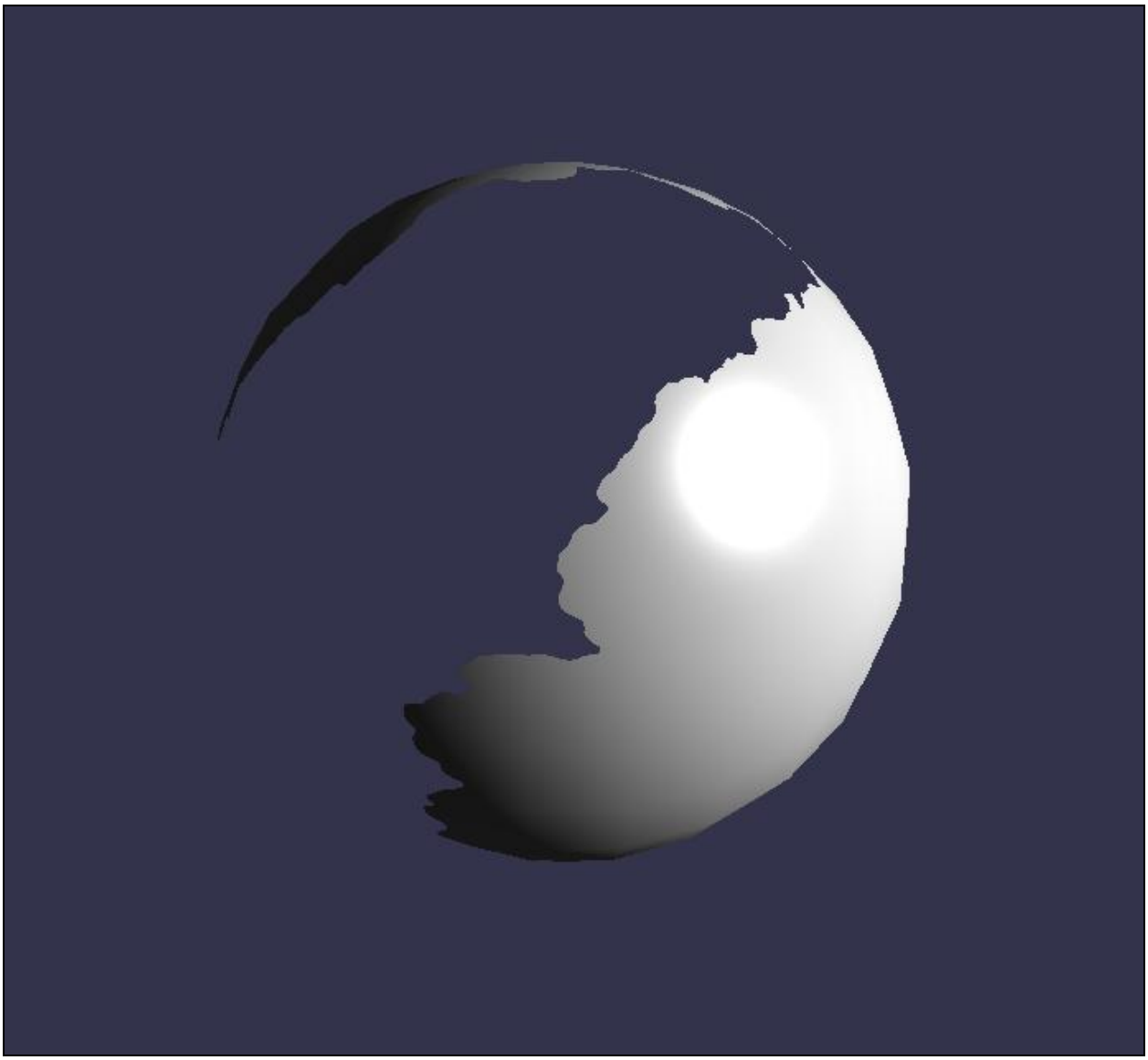


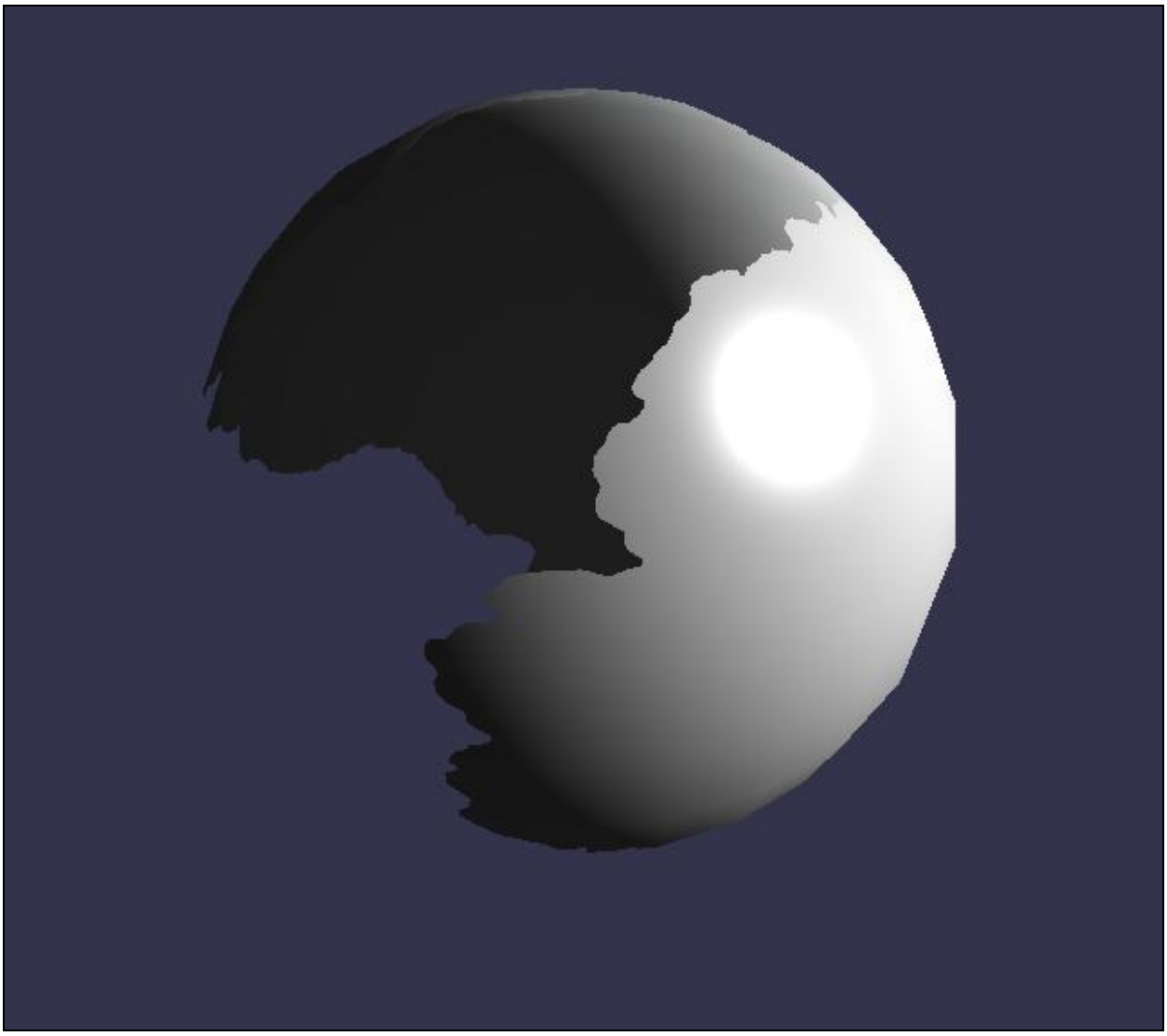


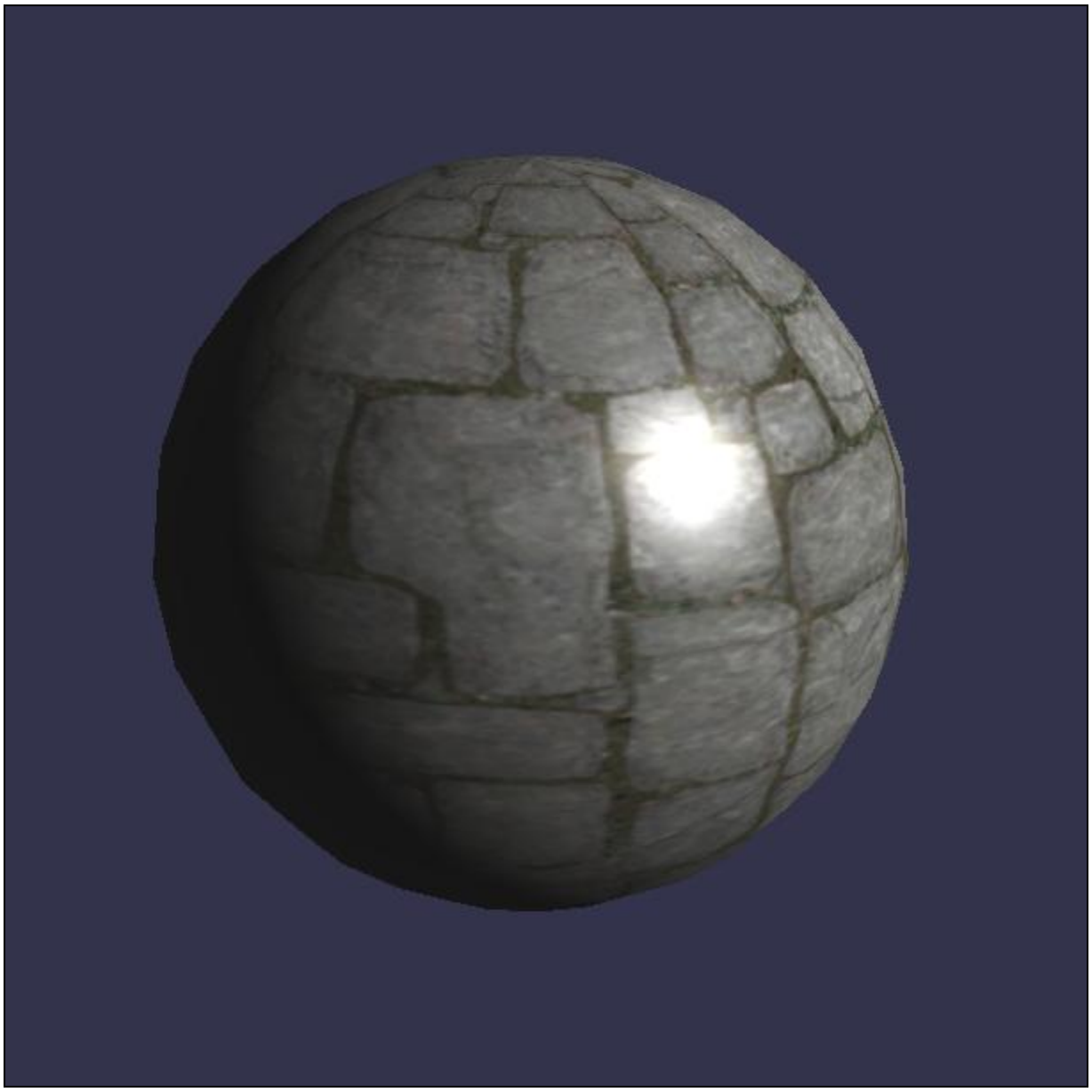


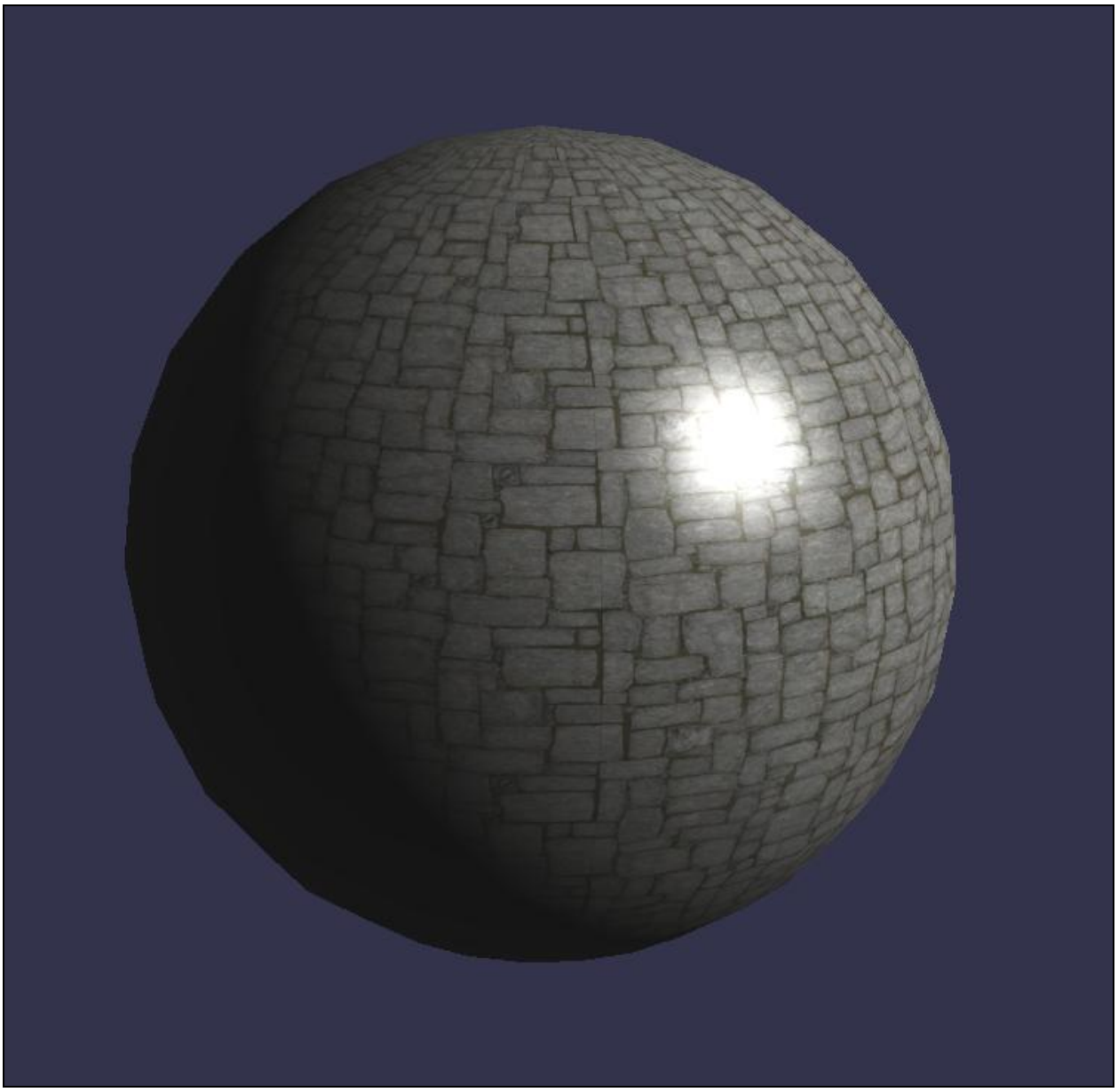


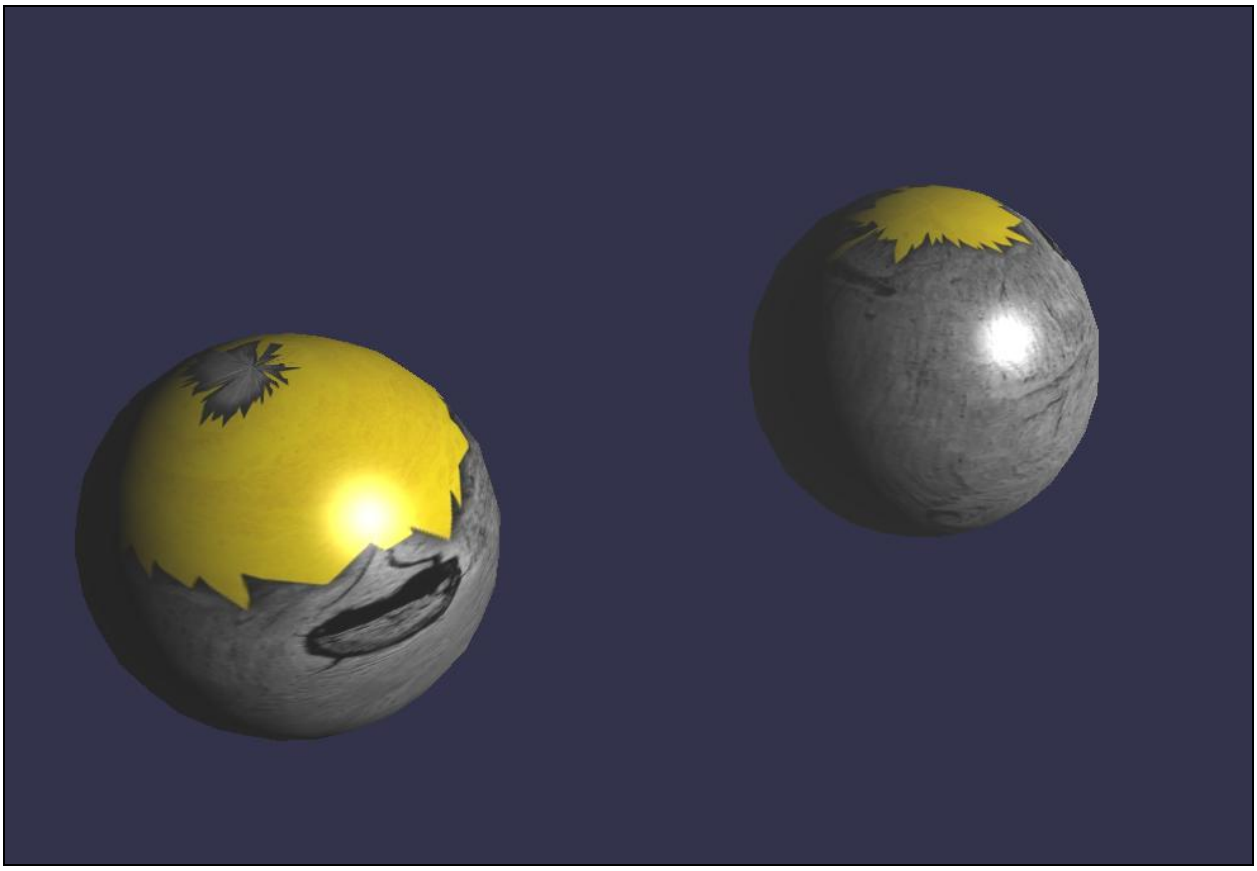


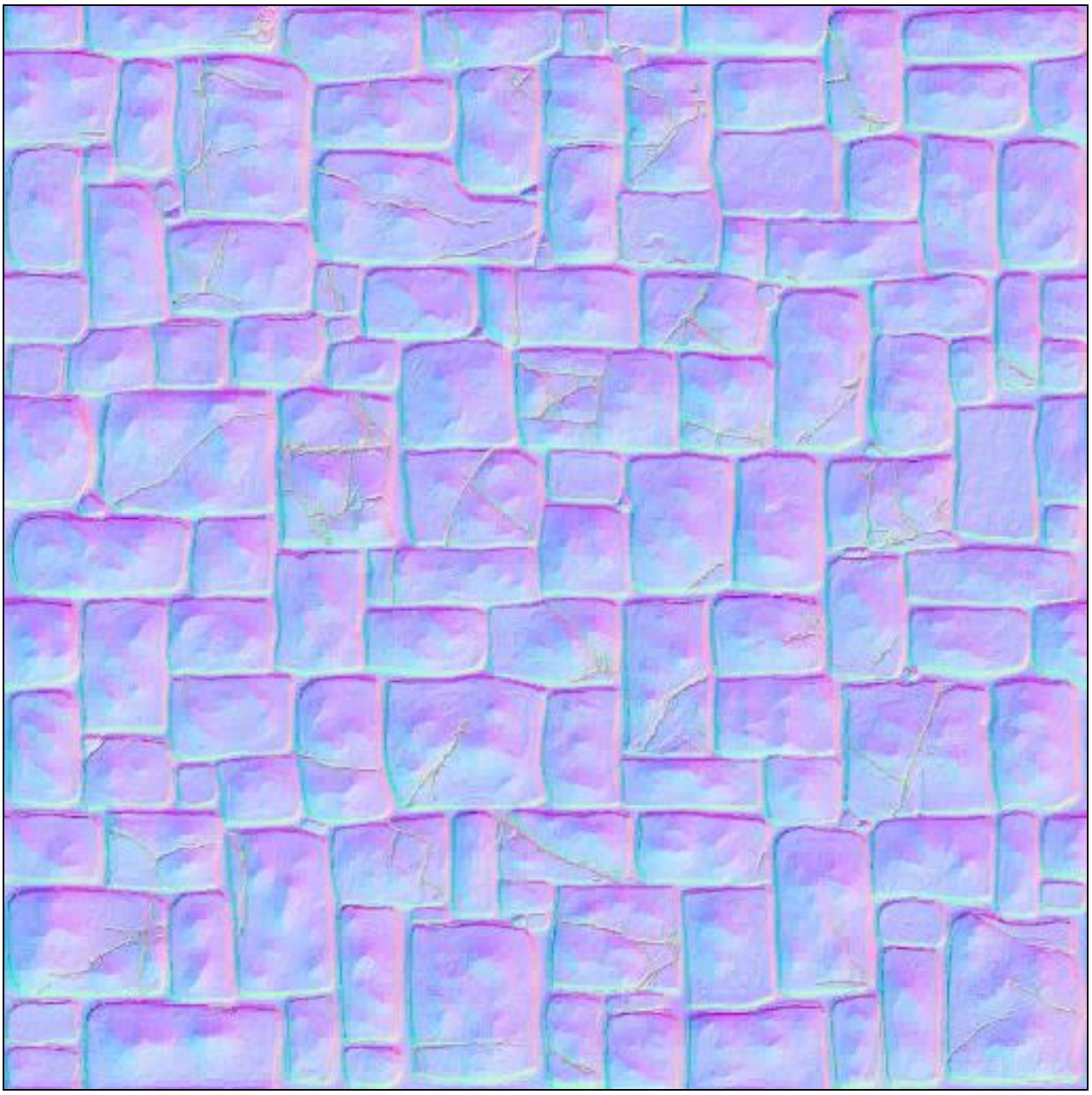


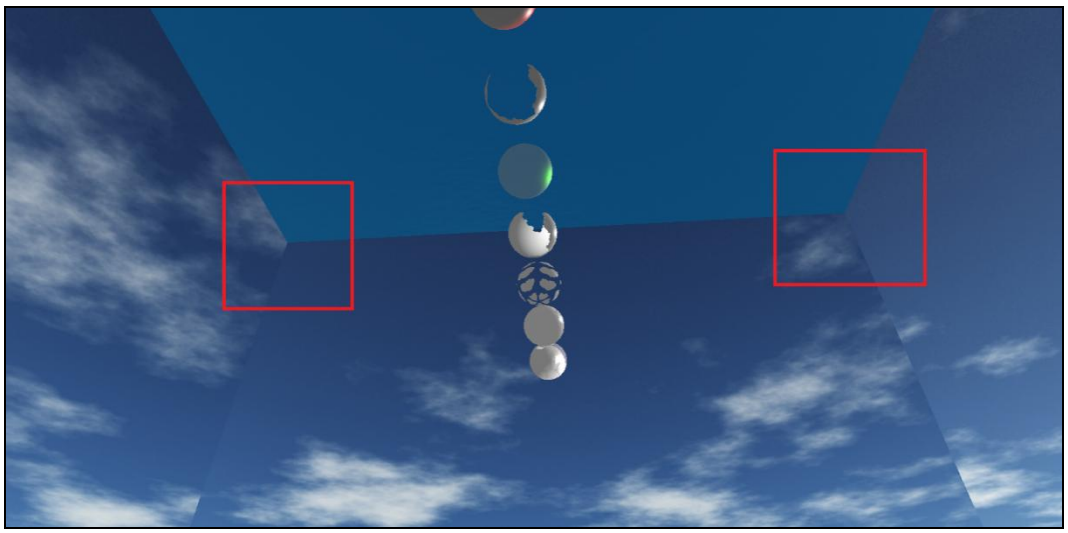


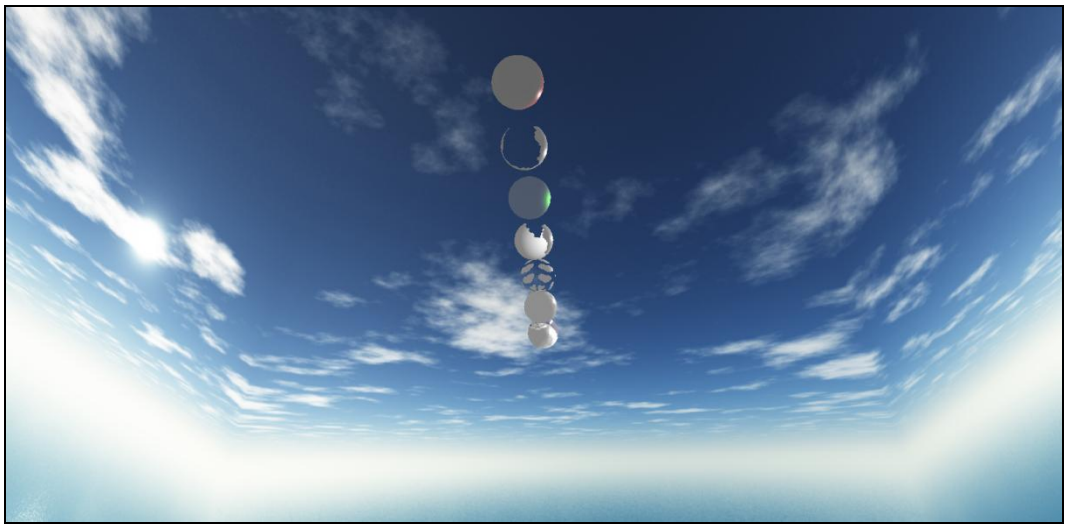


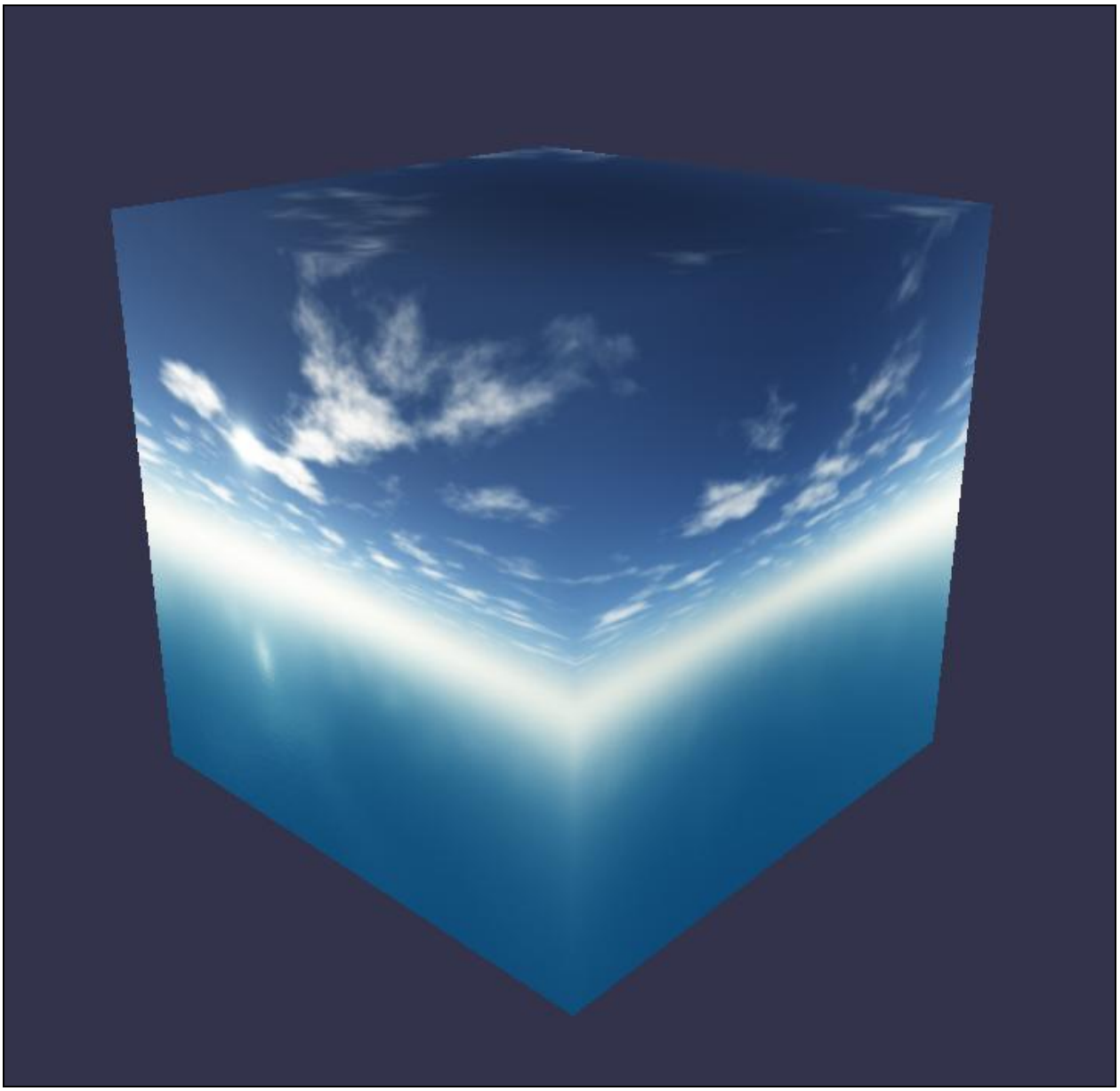


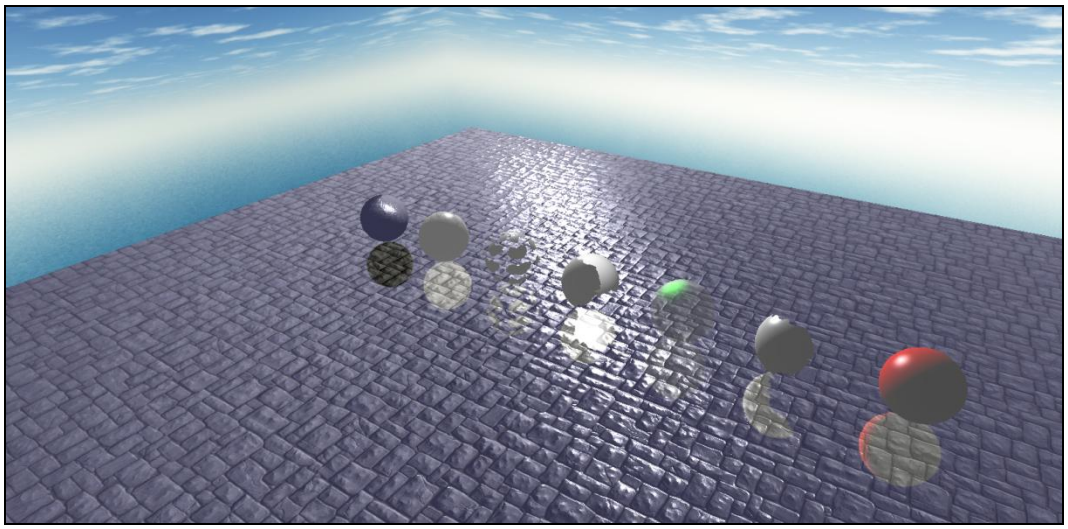


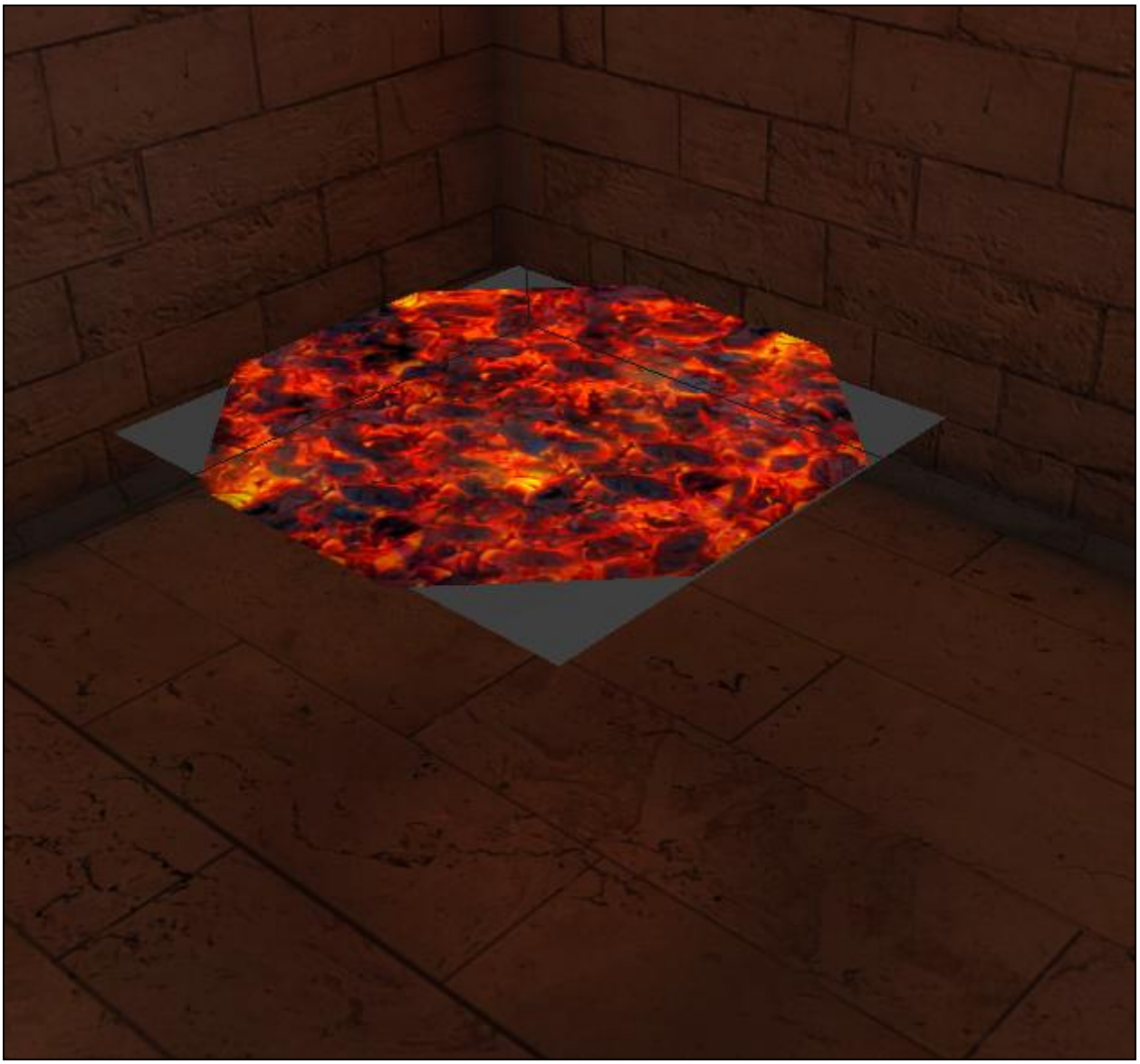




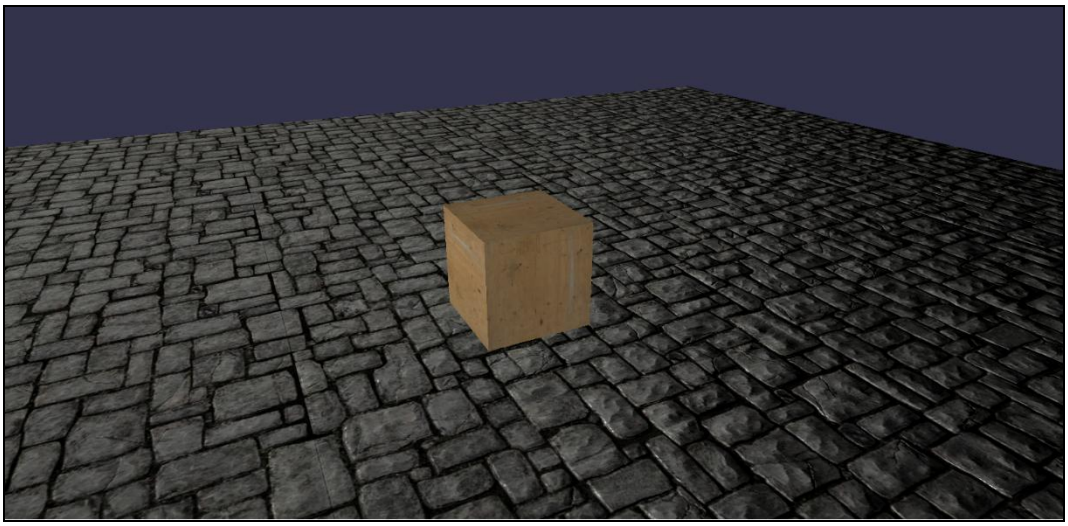


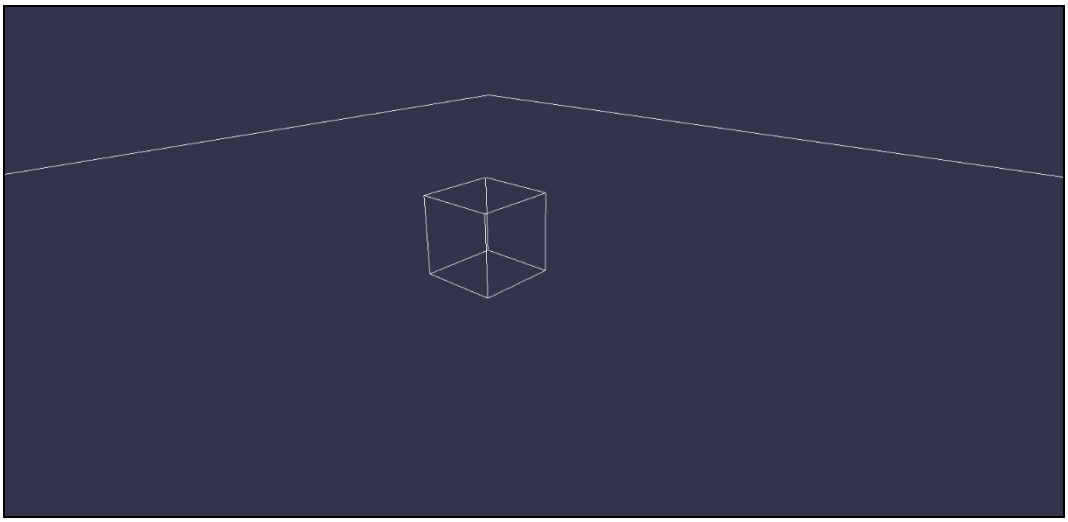


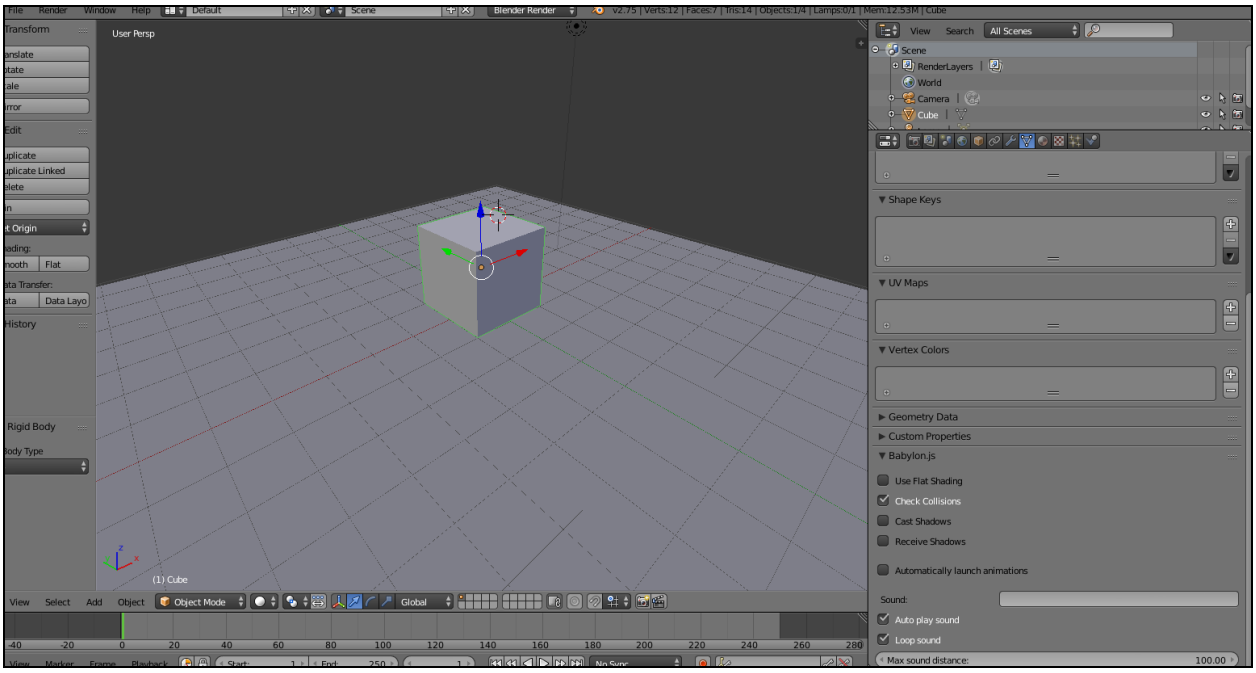


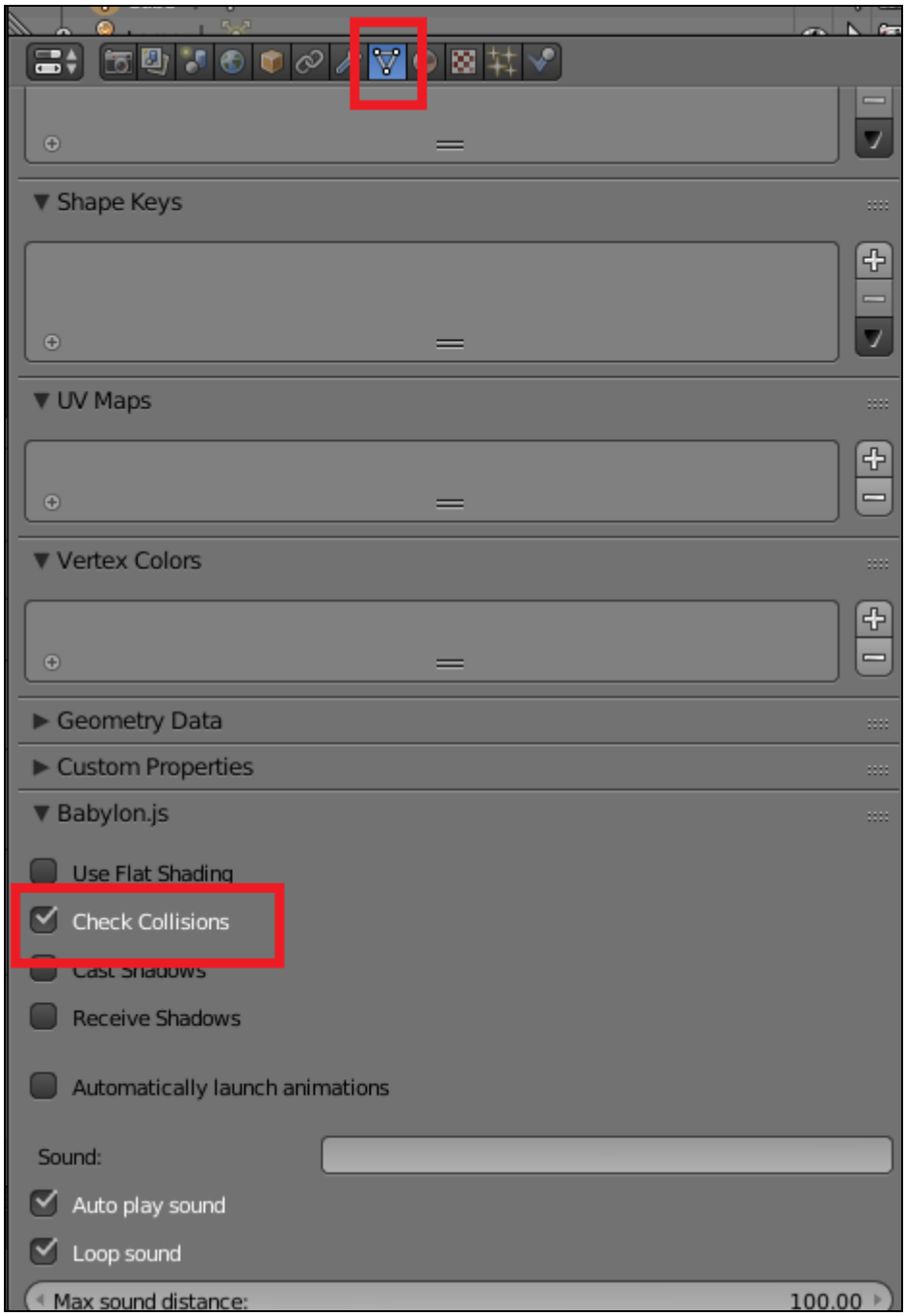


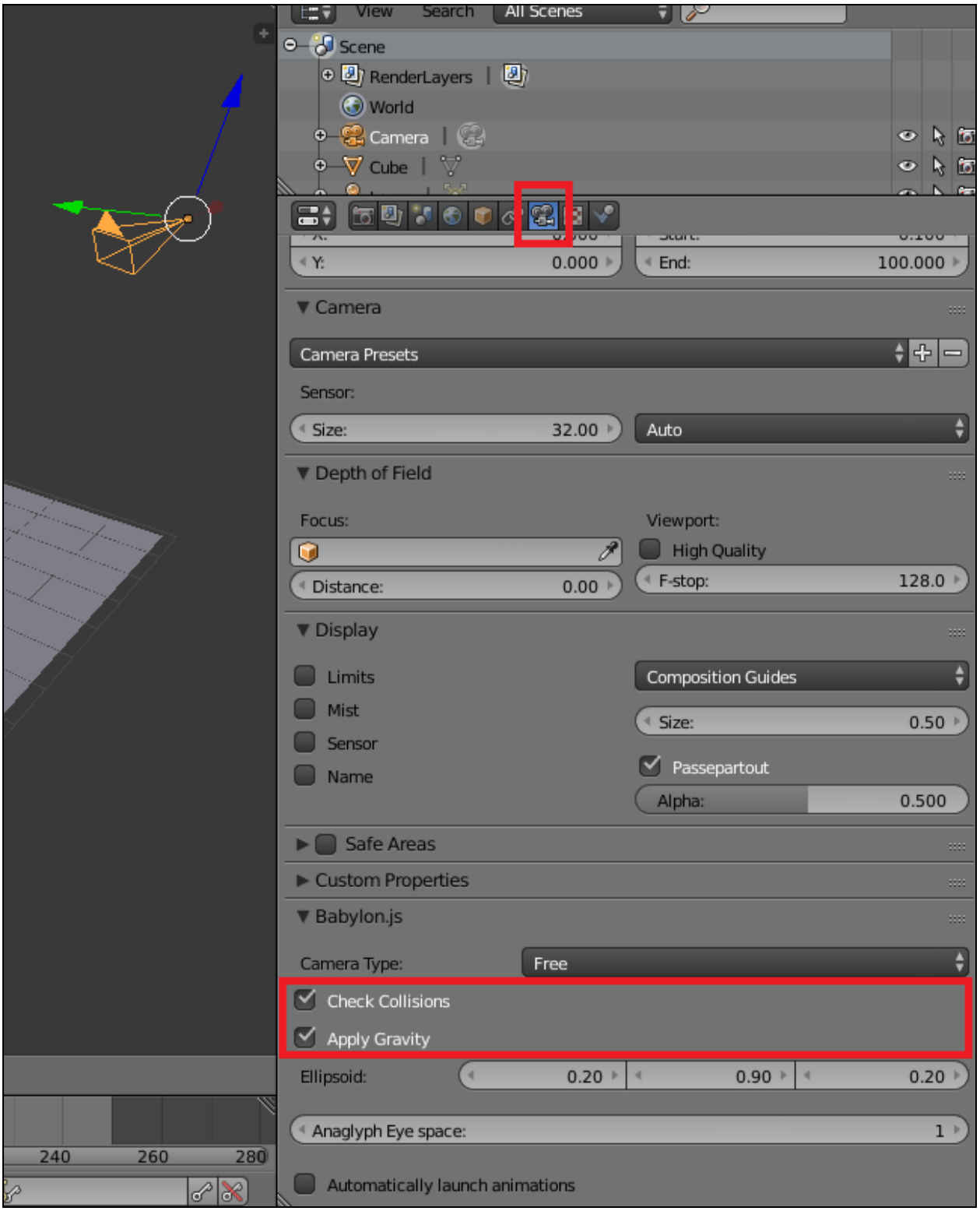
Chapter 5: Create Collisions on Objects

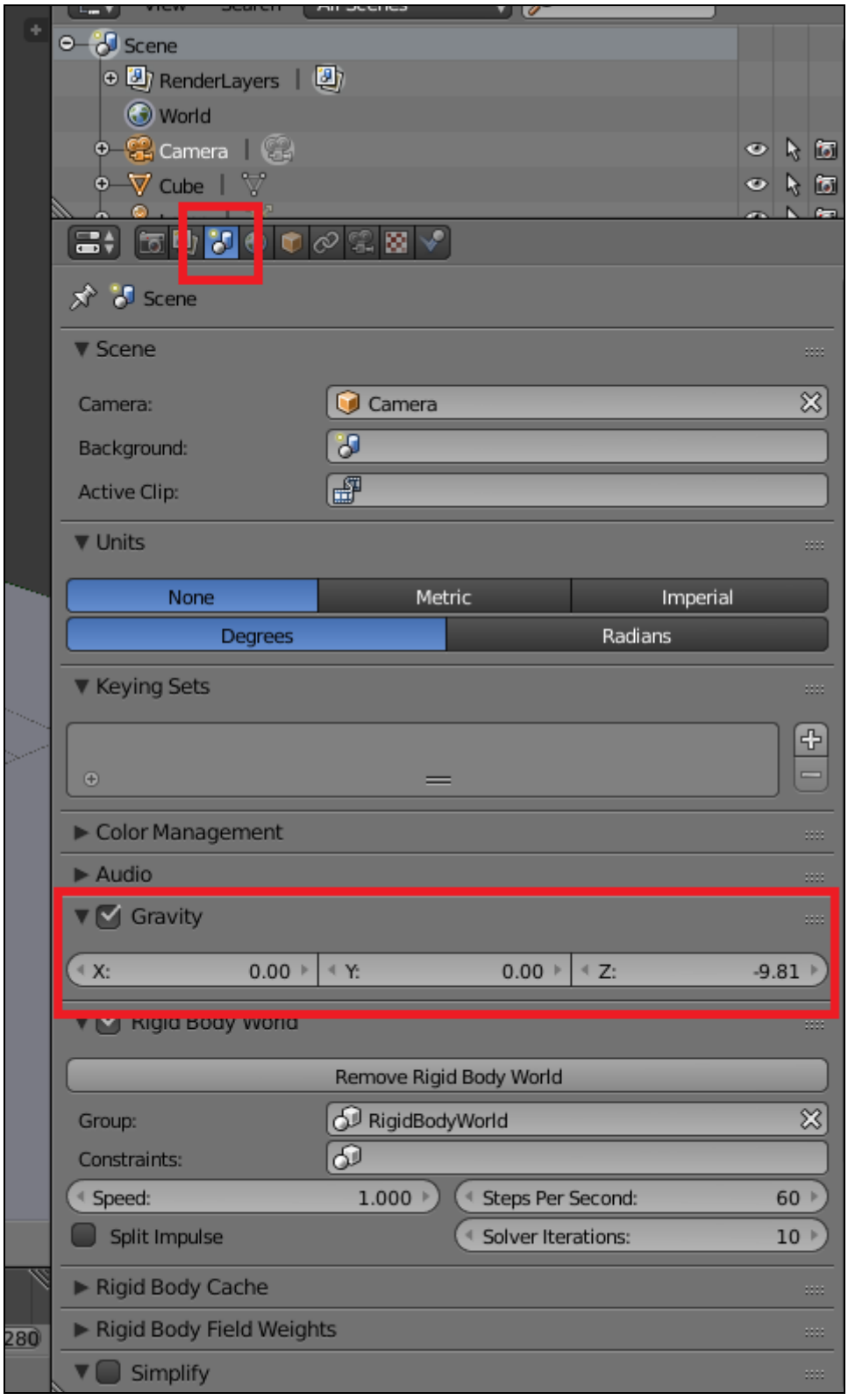


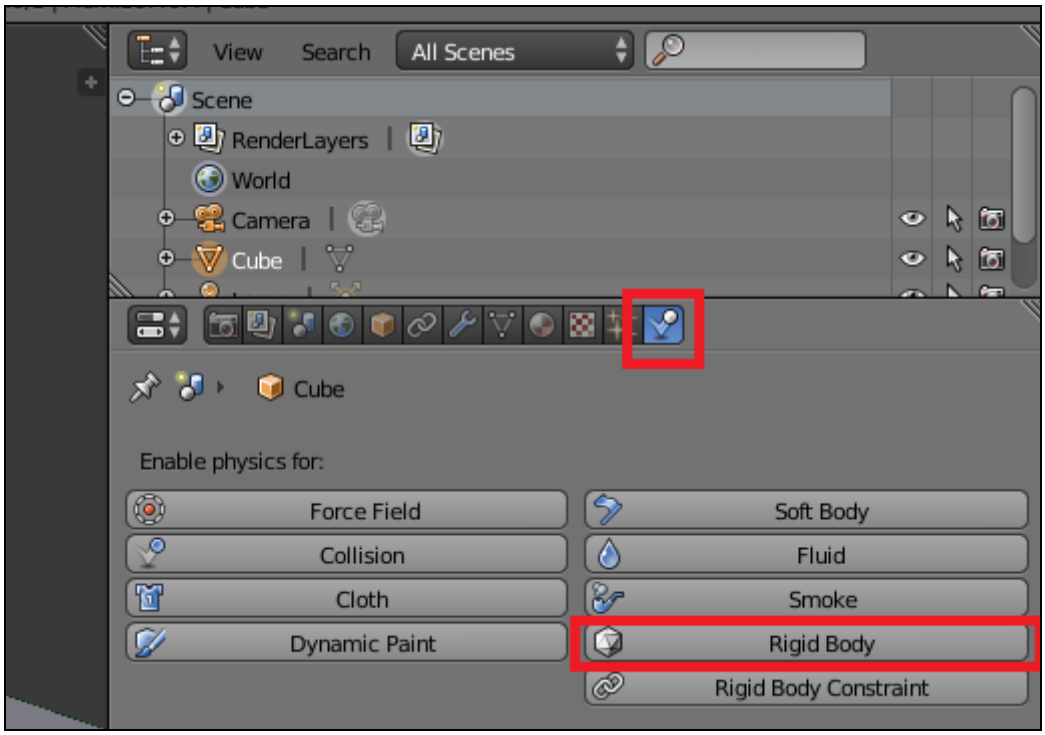


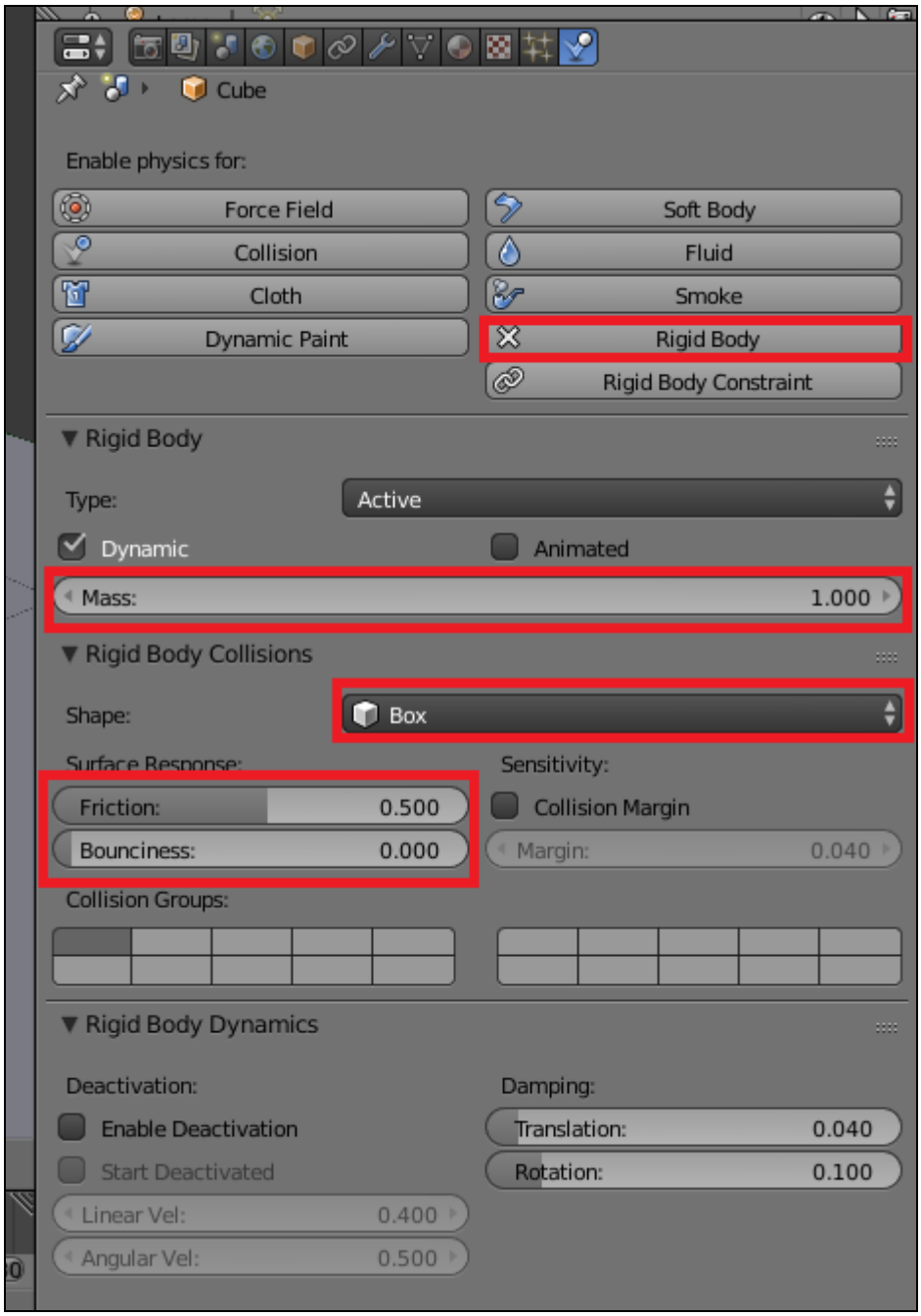

File Render Window Help Default Scene Blender Render v2.75 | Verts:12 | Faces:7 | Tris:14 | Objects:1/4 | Lamps:0/1 | Mem:12.53M | Cube
Transform
Edit
Rigid Body
History
User Persp
(1) Cube
View Select Add Object Object Mode Global
View Search All Scenes
Scene
RenderLayers
World
Camera
Cube
Shape Keys
UV Maps
Vertex Colors
Geometry Data
Custom Properties
Babylon.js
Use Flat Shading
Check Collisions
Cast Shadows
Receive Shadows
Automatically launch animations
Sound:
Auto play sound
Loop sound
Max sound distance: 100.00

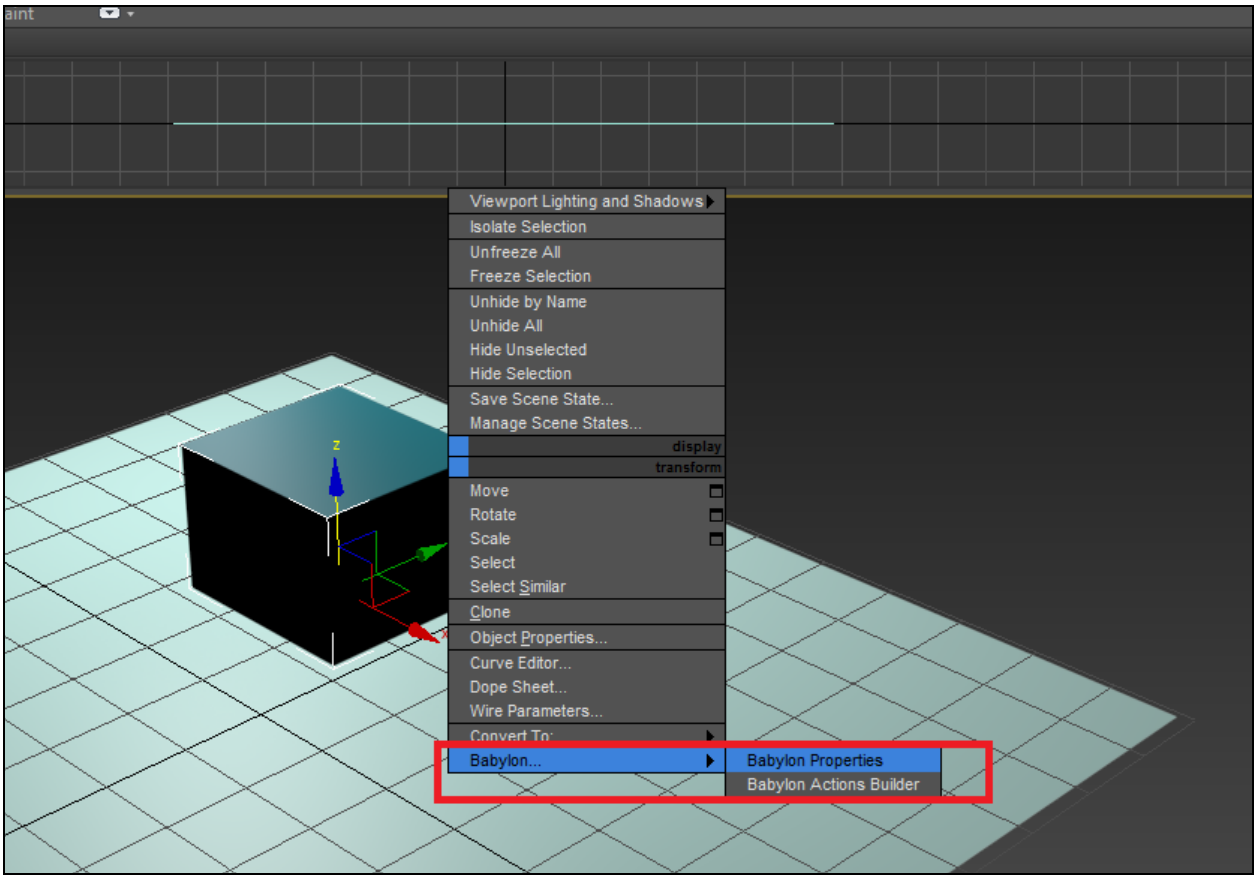

Shape Keys
UV Maps
Vertex Colors
Geometry Data
Custom Properties
Babylon.js
Use Flat Shading
Check Collisions
Receive Shadows
Automatically launch animations
Sound:
Auto play sound
Loop sound
Max sound distance:
100.00

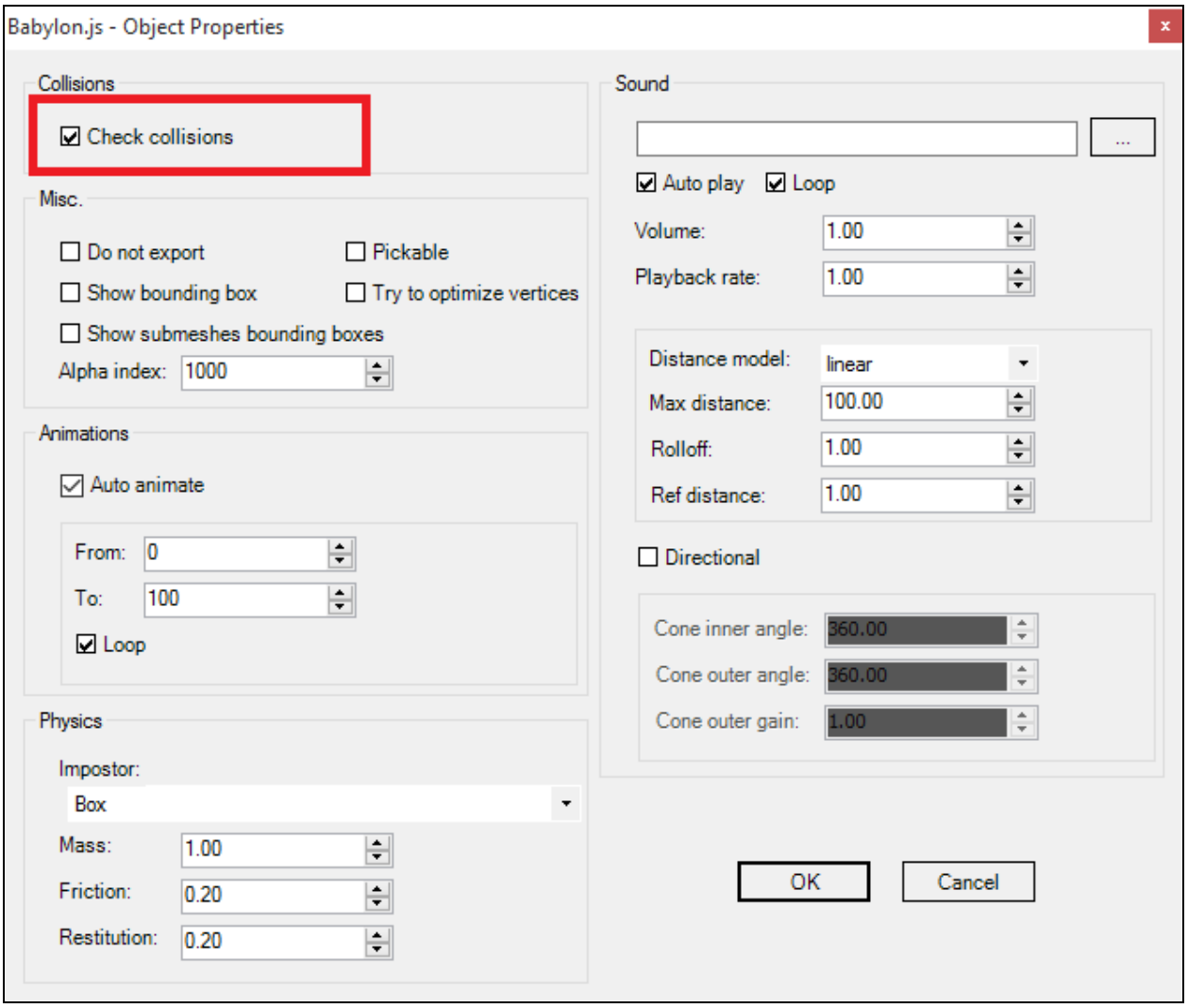

View
Search
All Scenes
Scene
RenderLayers
World
Camera
Cube
Y: 0.000
End: 100.000
Camera
Camera Presets
Sensor:
Size: 32.00
Auto
Depth of Field
Focus:
Viewport:
High Quality
Distance: 0.00
F-stop: 128.0
Display
Limits
Mist
Sensor
Name
Composition Guides
Size: 0.50
Passepartout
Alpha: 0.500
Safe Areas
Custom Properties
Babylon.js
Camera Type:
Free
Check Collisions
Apply Gravity
Ellipsoid:
0.20
0.90
0.20
Anaglyph Eye space: 1
Automatically launch animations
240
260
280

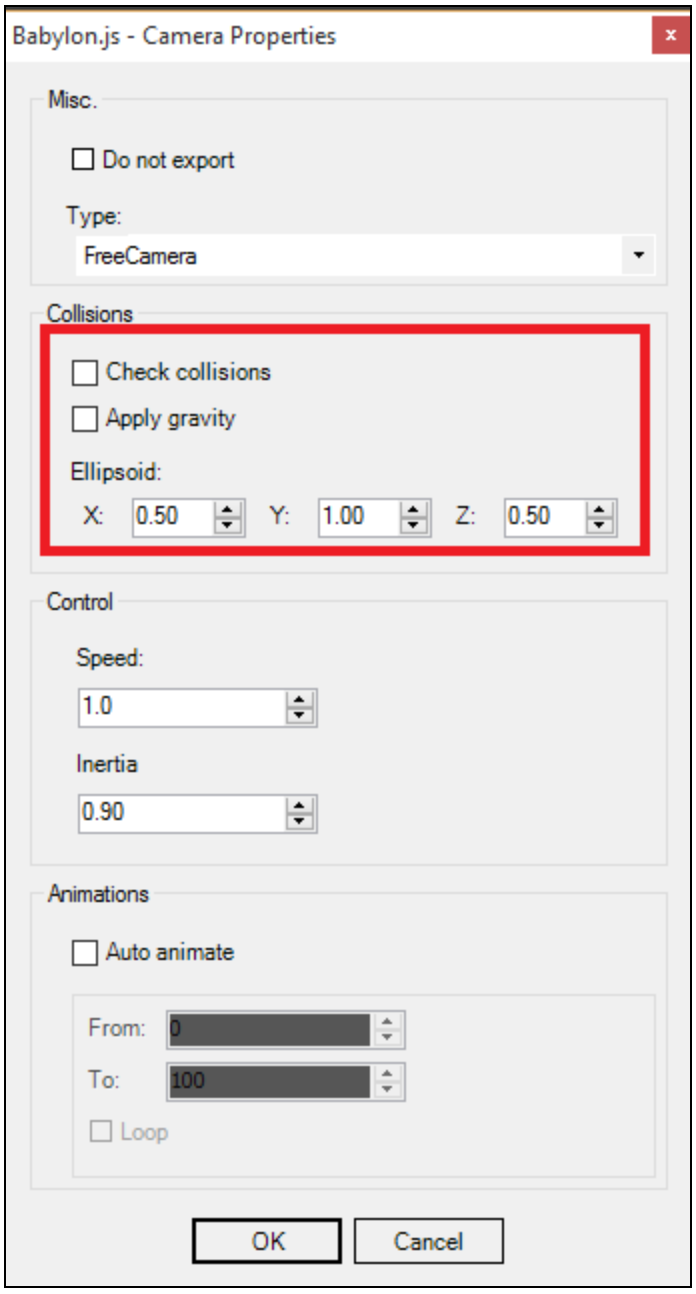

Scene
RenderLayers
World
Camera
Cube
Scene
Scene
Camera:
Camera
Background:
Active Clip:
Units
None
Metric
Imperial
Degrees
Radians
Keying Sets
Color Management
Audio
Gravity
X: 0.00
Y: 0.00
Z: -9.81
Remove Rigid Body World
Group:
RigidBodyWorld
Constraints:
Speed: 1.000
Steps Per Second: 60
Split Impulse
Solver Iterations: 10
Rigid Body Cache
Rigid Body Field Weights
Simplify

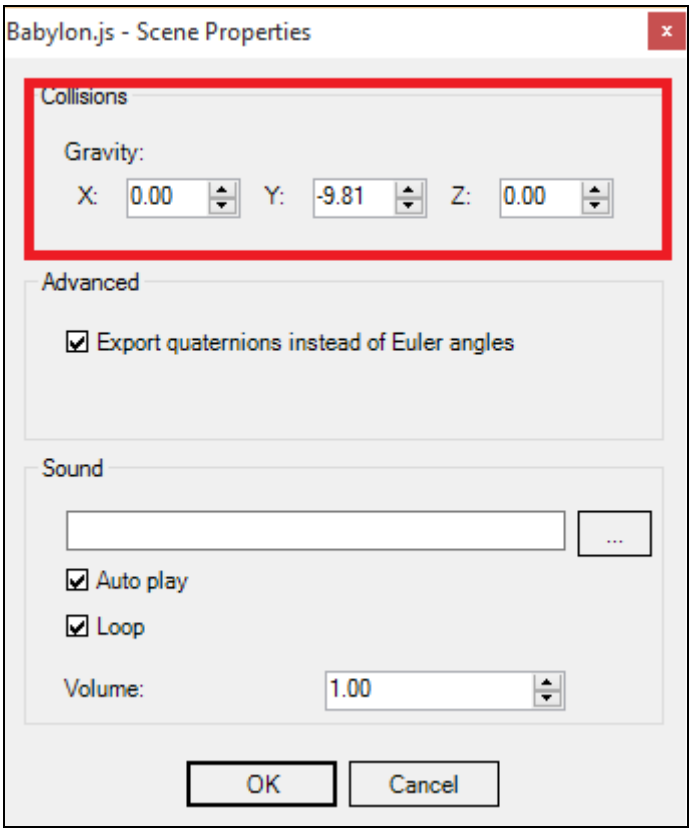

View
Search
All Scenes
Scene
RenderLayers
World
Camera
Cube
Cube
Enable physics for:
Force Field
Collision
Cloth
Dynamic Paint
Soft Body
Fluid
Smoke
Rigid Body
Rigid Body Constraint

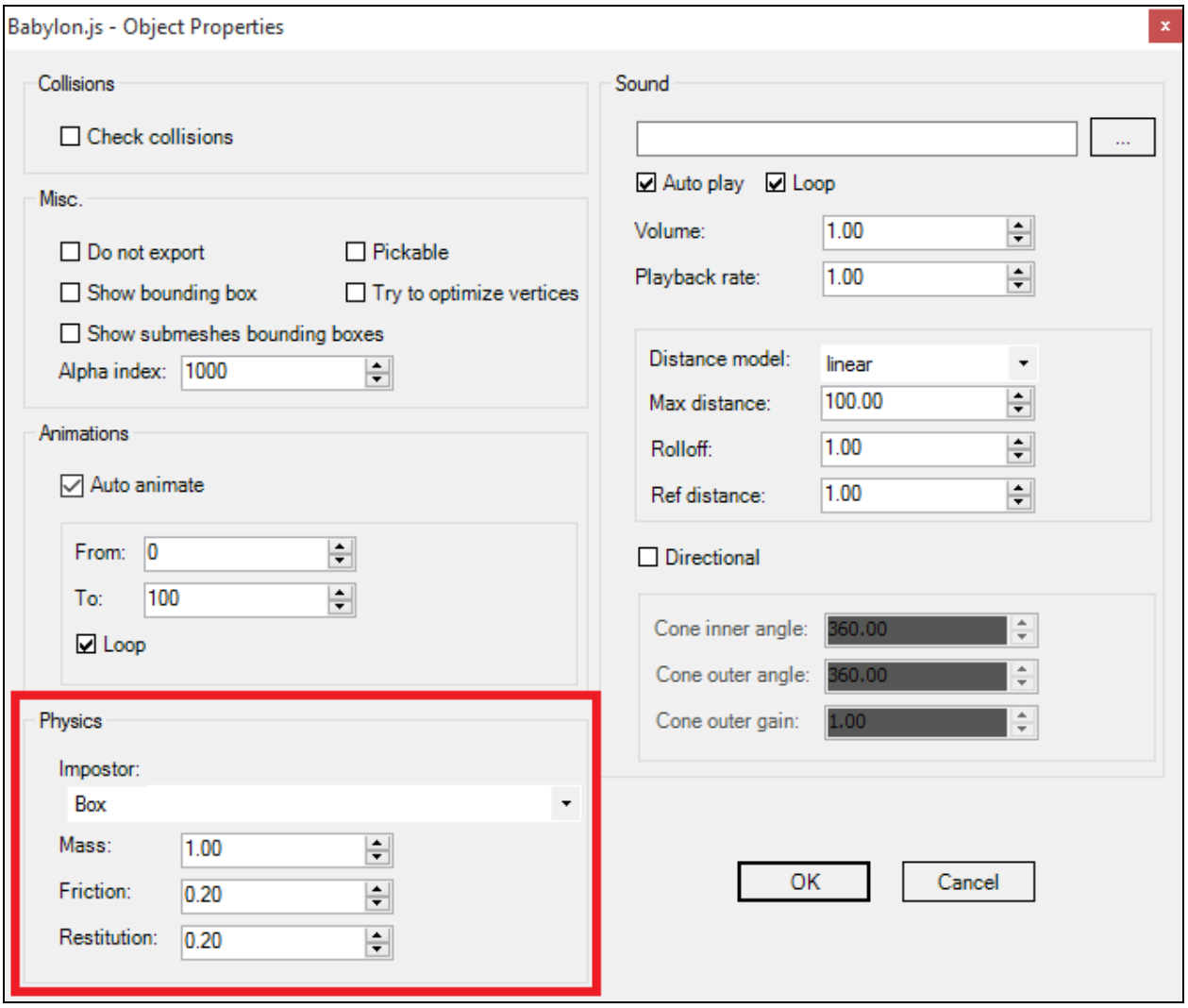

Cube
Enable physics for:
Force Field
Soft Body
Collision
Fluid
Cloth
Smoke
Dynamic Paint
Rigid Body
Rigid Body Constraint
Rigid Body
Type:
Active
Dynamic
Animated
Mass:
1.000
Rigid Body Collisions
Shape:
Box
Surface Response:
Friction:
0.500
Bounciness:
0.000
Sensitivity:
Collision Margin
Margin:
0.040
Collision Groups:
Rigid Body Dynamics
Deactivation:
Enable Deactivation
Start Deactivated
Linear Vel:
0.400
Angular Vel:
0.500
Damping:
Translation:
0.040
Rotation:
0.100


Viewport Lighting and Shadows
Isolate Selection
Unfreeze All
Freeze Selection
Unhide by Name
Unhide All
Hide Unselected
Hide Selection
Save Scene State...
Manage Scene States...
display
transform
Move
Rotate
Scale
Select
Select Similar
Clone
Object Properties...
Curve Editor...
Dope Sheet...
Wire Parameters...
Convert To:
Babylon...
Babylon Properties
Babylon Actions Builder

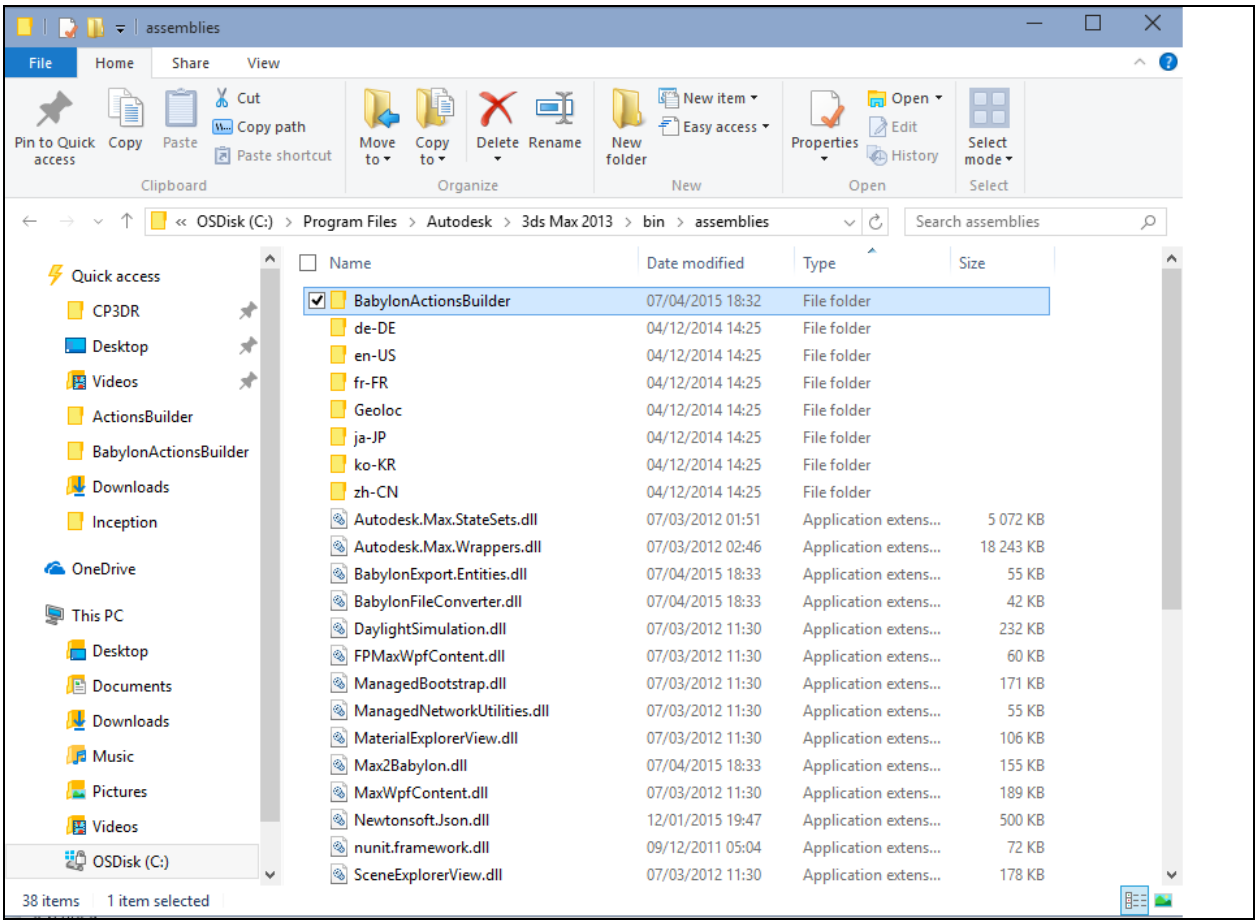

Babylon.js - Object Properties
Collisions
Check collisions
Misc.
Do not export
Pickable
Show bounding box
Try to optimize vertices
Show submeshes bounding boxes
Alpha index:
1000
Animations
Auto animate
From:
0
To:
100
Loop
Physics
Impostor:
Box
Mass:
1.00
Friction:
0.20
Restitution:
0.20
Sound
...
Auto play
Loop
Volume:
1.00
Playback rate:
1.00
Distance model:
linear
Max distance:
100.00
Rolloff:
1.00
Ref distance:
1.00
Directional
Cone inner angle:
360.00
Cone outer angle:
360.00
Cone outer gain:
1.00
OK
Cancel

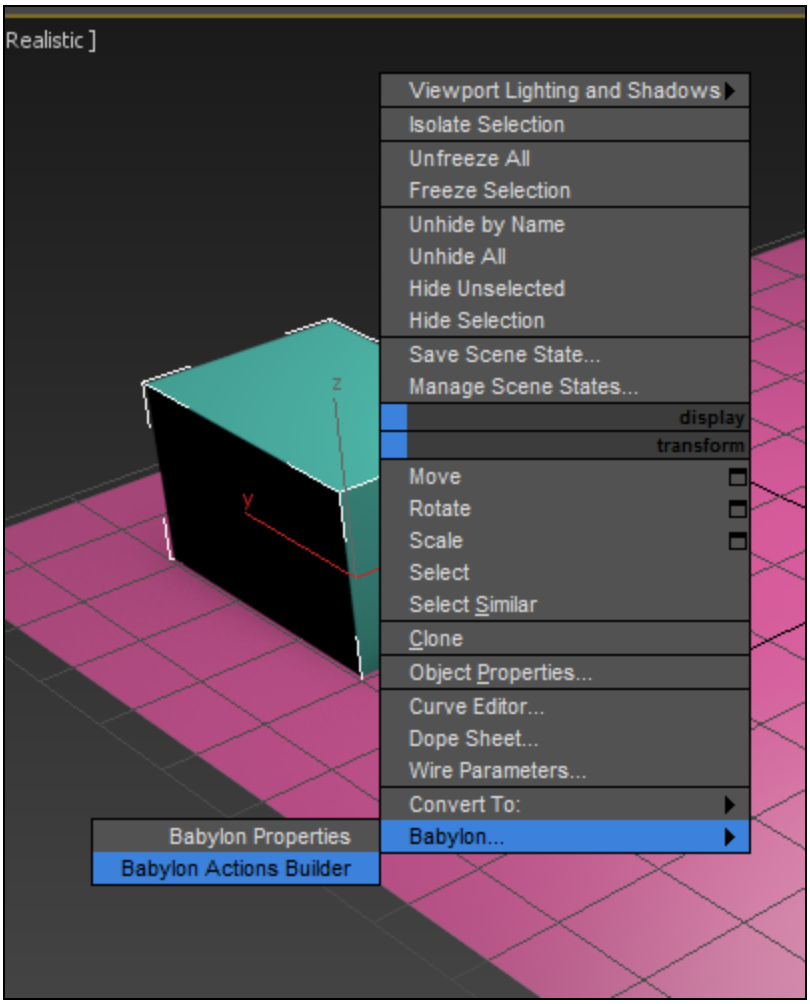

Babylon.js - Camera Properties
Misc.
Do not export
Type:
FreeCamera
Collisions
Check collisions
Apply gravity
Ellipsoid:
X: 0.50
Y: 1.00
Z: 0.50
Control
Speed:
1.0
Inertia
0.90
Animations
Auto animate
From: 0
To: 100
Loop
OK
Cancel

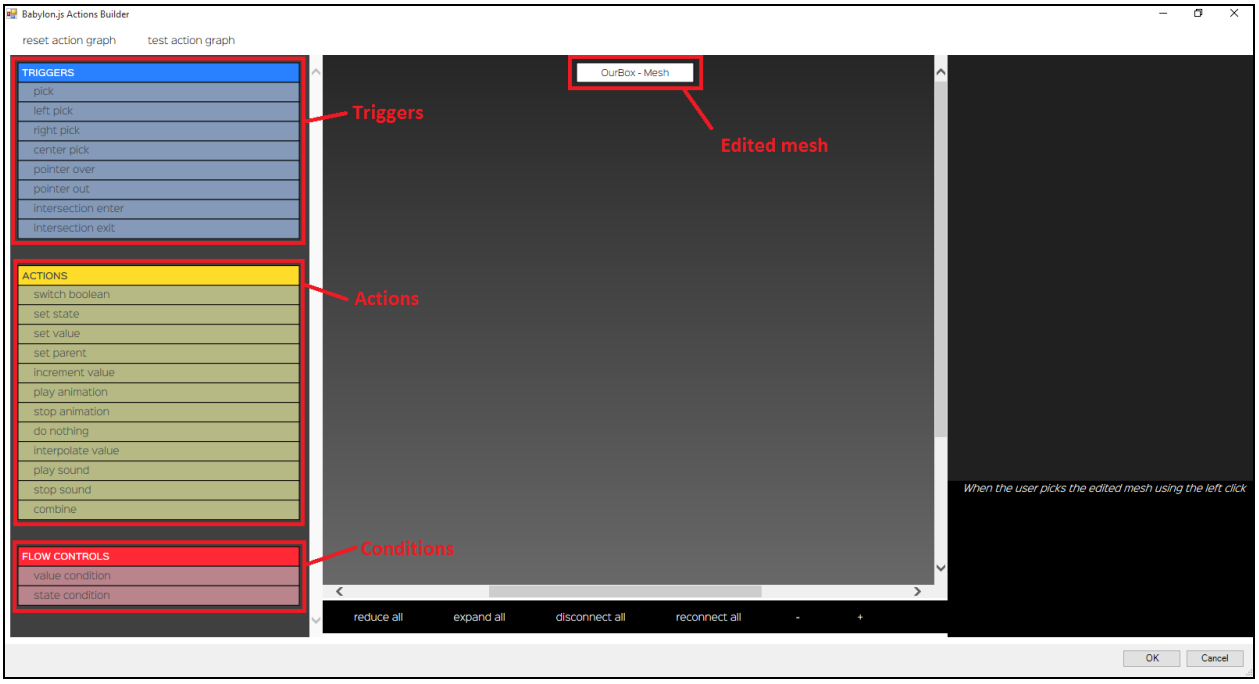

Babylon.js - Scene Properties
Collisions
Gravity:
X: 0.00
Y: -9.81
Z: 0.00
Advanced
Export quaternions instead of Euler angles
Sound
...
Auto play
Loop
Volume: 1.00
OK
Cancel

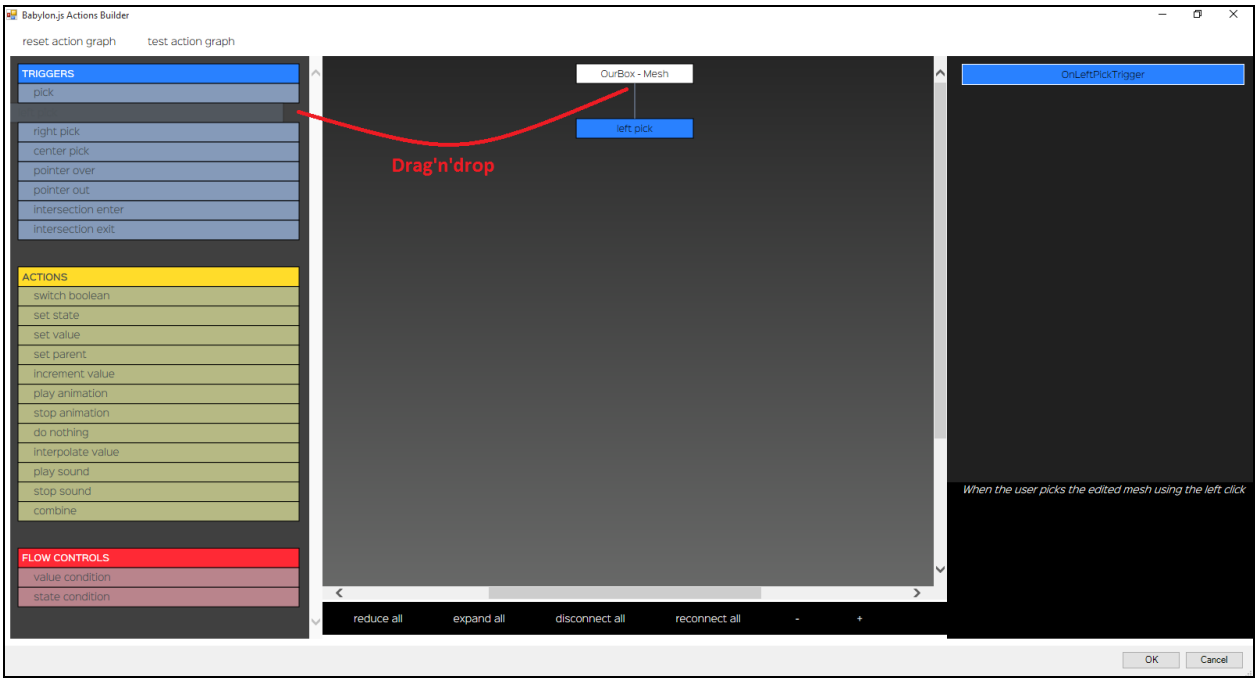

Babylon.js - Object Properties
Collisions
Check collisions
Misc.
Do not export
Pickable
Show bounding box
Try to optimize vertices
Show submeshes bounding boxes
Alpha index: 1000
Animations
Auto animate
From: 0
To: 100
Loop
Physics
Impostor:
Box
Mass: 1.00
Friction: 0.20
Restitution: 0.20
Sound
...
Auto play
Loop
Volume: 1.00
Playback rate: 1.00
Distance model: linear
Max distance: 100.00
Rolloff: 1.00
Ref distance: 1.00
Directional
Cone inner angle: 360.00
Cone outer angle: 360.00
Cone outer gain: 1.00
OK
Cancel

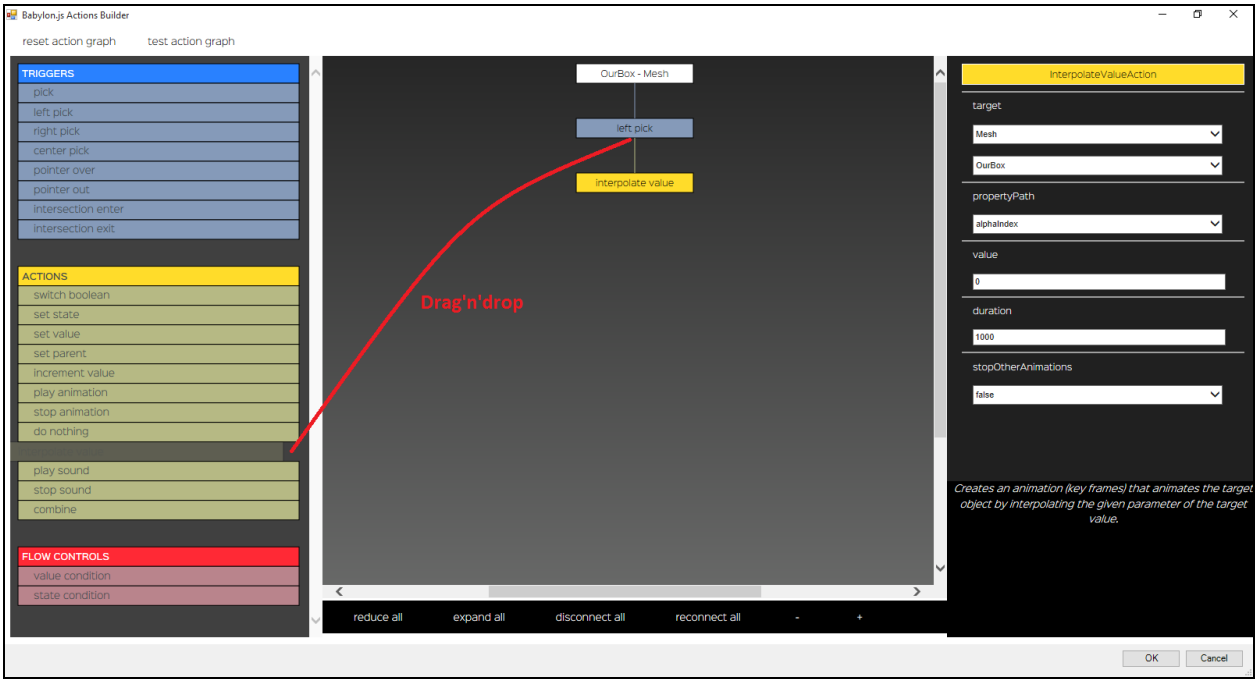
Chapter 7: Defining Actions on Objects

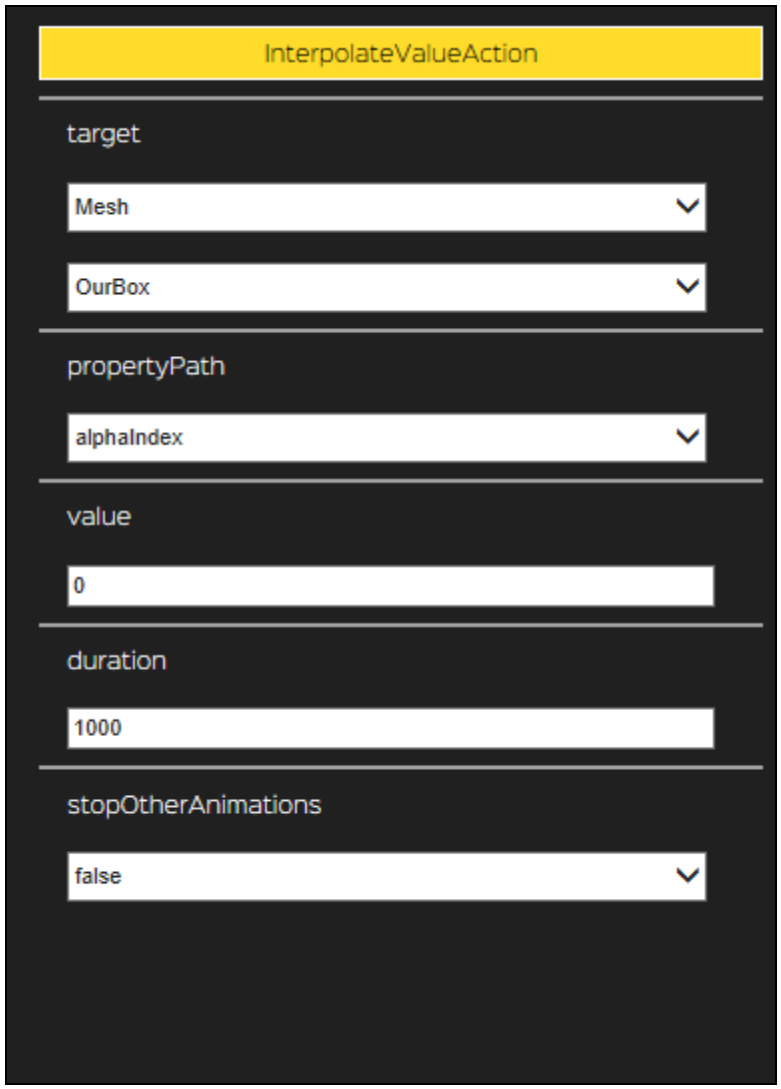



Realistic]
Viewport Lighting and Shadows
Isolate Selection
Unfreeze All
Freeze Selection
Unhide by Name
Unhide All
Hide Unselected
Hide Selection
Save Scene State...
Manage Scene States...
display
transform
Move
Rotate
Scale
Select
Select Similar
Clone
Object Properties...
Curve Editor...
Dope Sheet...
Wire Parameters...
Convert To:
Babylon...
Babylon Properties
Babylon Actions Builder


Babylon.js Actions Builder
reset action graph
test action graph
TRIGGERS
pick
left pick
right pick
center pick
pointer over
pointer out
intersection enter
intersection exit
ACTIONS
switch boolean
set state
set value
set parent
increment value
play animation
stop animation
do nothing
interpolate value
play sound
stop sound
combine
FLOW CONTROLS
value condition
state condition
Triggers
Actions
Conditions
OurBox - Mesh
Edited mesh
reduce all
expand all
disconnect all
reconnect all
-
+
When the user picks the edited mesh using the left click
OK
Cancel


Babylon.js Actions Builder
reset action graph
test action graph
TRIGGERS
pick
right pick
center pick
pointer over
pointer out
intersection enter
intersection exit
ACTIONS
switch boolean
set state
set value
set parent
increment value
play animation
stop animation
do nothing
interpolate value
play sound
stop sound
combine
FLOW CONTROLS
value condition
state condition
OurBox - Mesh
left pick
Drag'n'drop
reduce all
expand all
disconnect all
reconnect all
-
+
OnLeftPickTrigger
When the user picks the edited mesh using the left click
OK
Cancel

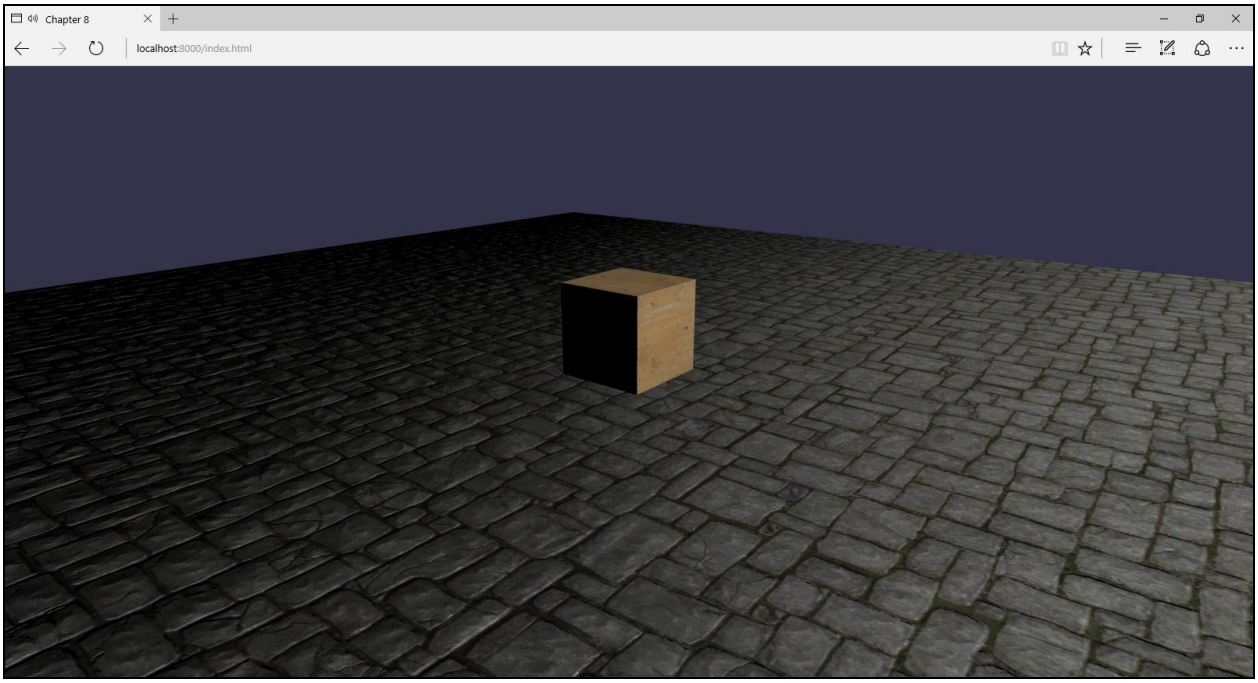

Babylon.js Actions Builder
reset action graph
test action graph
TRIGGERS
pick
left pick
right pick
center pick
pointer over
pointer out
intersection enter
intersection exit
ACTIONS
switch boolean
set state
set value
set parent
increment value
play animation
stop animation
do nothing
play sound
stop sound
combine
FLOW CONTROLS
value condition
state condition
OurBox - Mesh
left pick
interpolate value
Drag'n'drop
reduce all
expand all
disconnect all
reconnect all
-
+
InterpolateValueAction
target
Mesh
OurBox
propertyPath
alphaIndex
value
0
duration
1000
stopOtherAnimations
false
Creates an animation (key frames) that animates the target object by interpolating the given parameter of the target value.
OK
Cancel

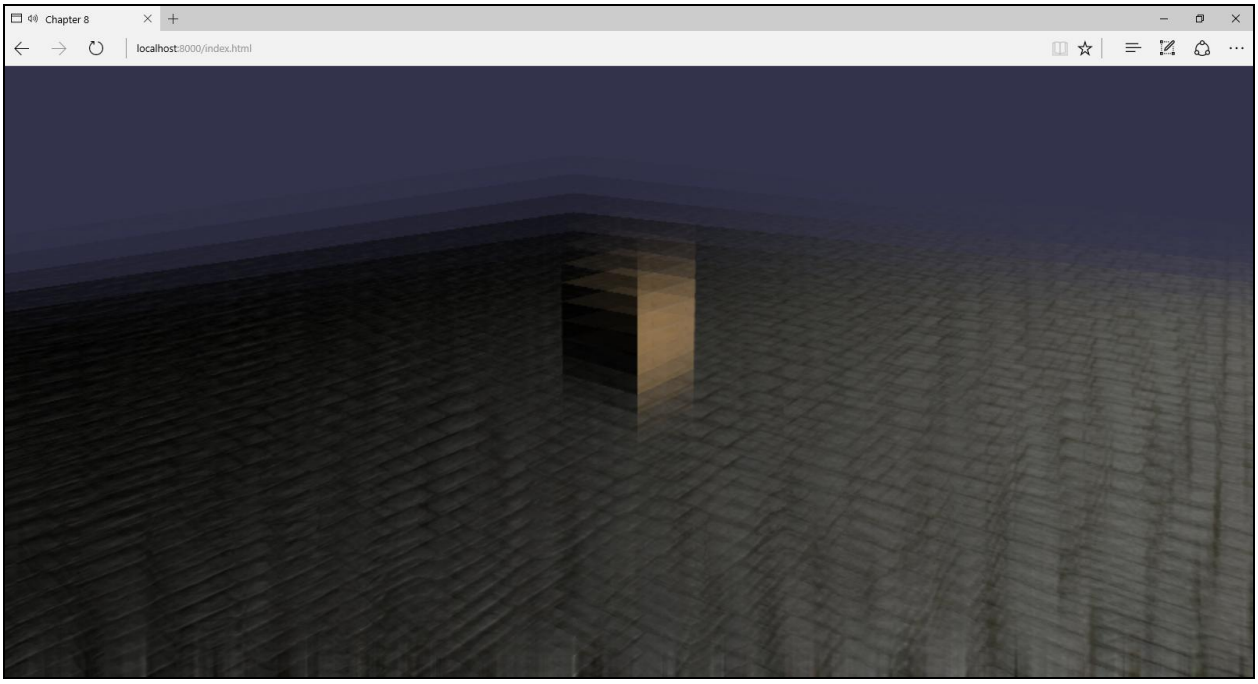

InterpolateValueAction
target
Mesh
OurBox
propertyPath
alphaIndex
value
0
duration
1000
stopOtherAnimations
false

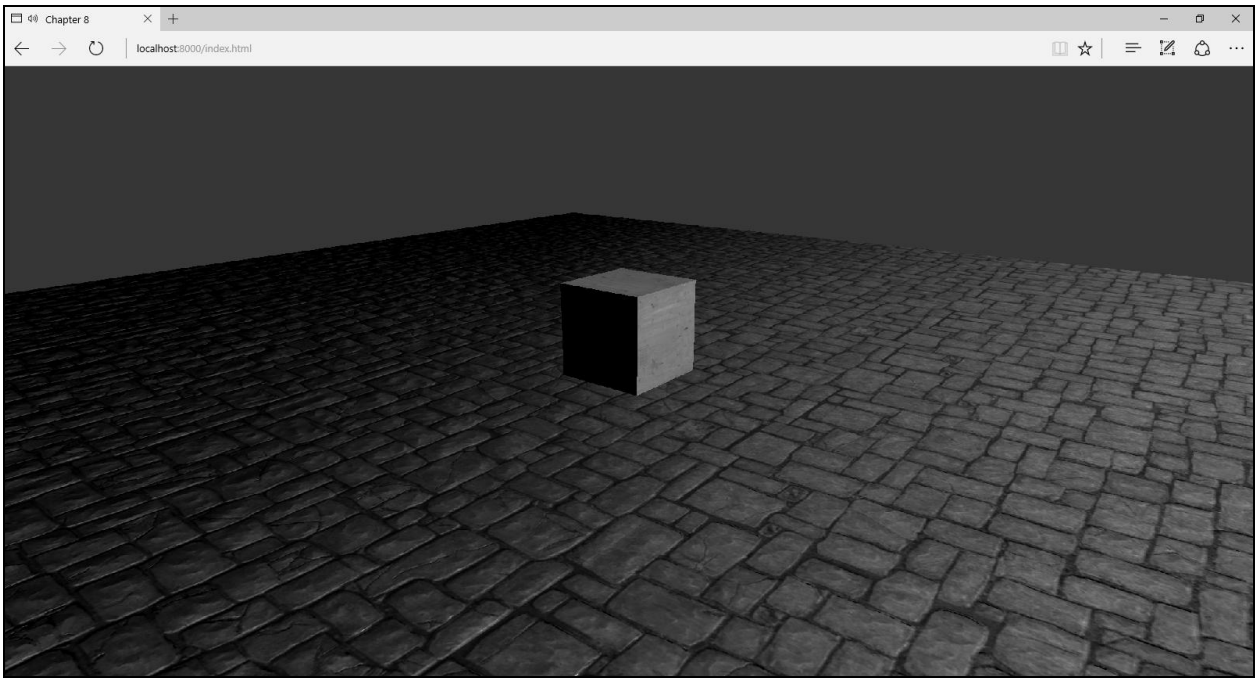
Babylon.js Actions Builder
reset action graph
test action graph
TRIGGERS
pick
left pick
right pick
center pick
pointer over
pointer out
intersection enter
intersection exit
ACTIONS
switch boolean
set state
set value
set parent
increment value
play animation
stop animation
do nothing
interpolate value
play sound
stop sound
combine
FLOW CONTROLS
value condition
state condition
OurBox - Mesh
left pick
Action 1
interpolate value
value condition
Action 2
set value
reduce all
expand all
disconnect all
reconnect all
-
+
ValueCondition
target
Mesh
OurBox
propertyPath
position
x,y,z,
value
0,0,0
operator
IsEqual
A condition checking if a given value is equal, different, lesse
or greater than the given parameter of the target object
OK
Cancel

Babylon.js Actions Builder
reset action graph
test action graph
TRIGGERS
pick
left pick
right pick
center pick
pointer over
pointer out
intersection enter
intersection exit
ACTIONS
switch boolean
set state
set value
set parent
increment value
play animation
stop animation
do nothing
interpolate value
play sound
stop sound
combine
FLOW CONTROLS
value condition
state condition
OurBox - Mesh
left pick
left pick
interpolate value
interpolate value
value condition
set value
reduce all
expand all
disconnect all
reconnect all
-
+
InterpolateValueAction
target
Mesh
OurBox
propertyPath
scaling
x,y,z,
value
2, 2, 2
duration
1000
stopOtherAnimations
false
Creates an animation (key frames) that animates the target
object by interpolating the given parameter of the target
value.
OK
Cancel

Chapter 8: Add Rendering Effects Using Built-in Post-processes



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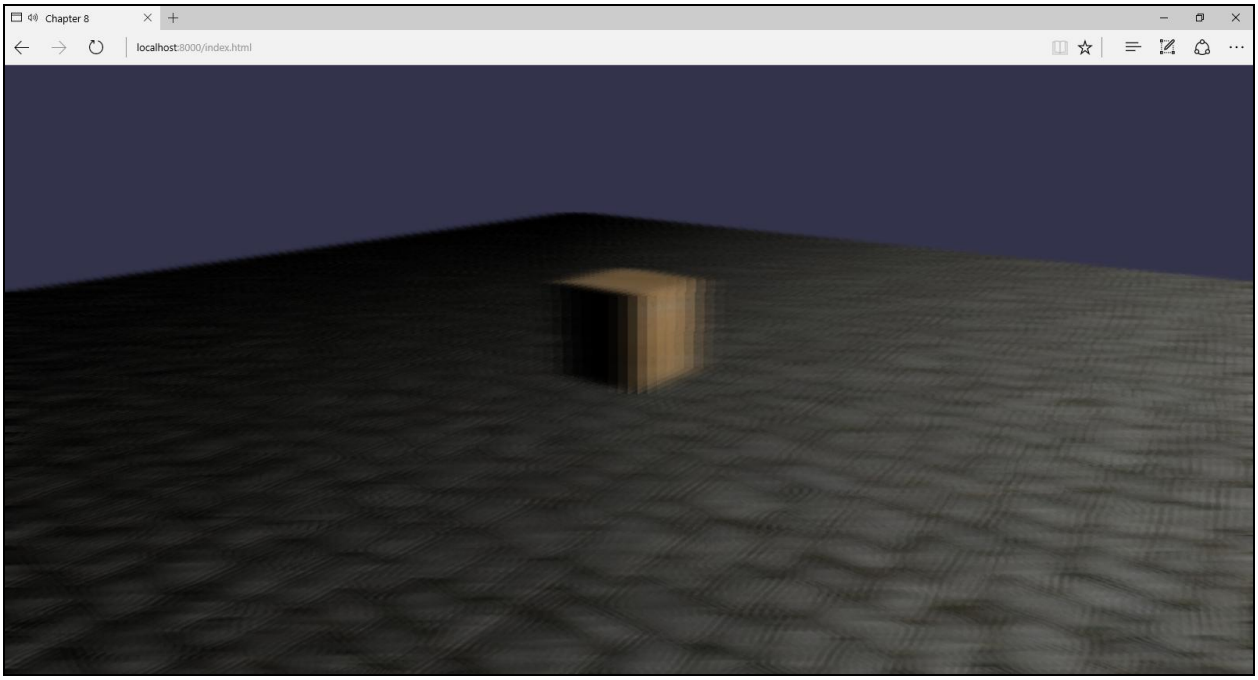
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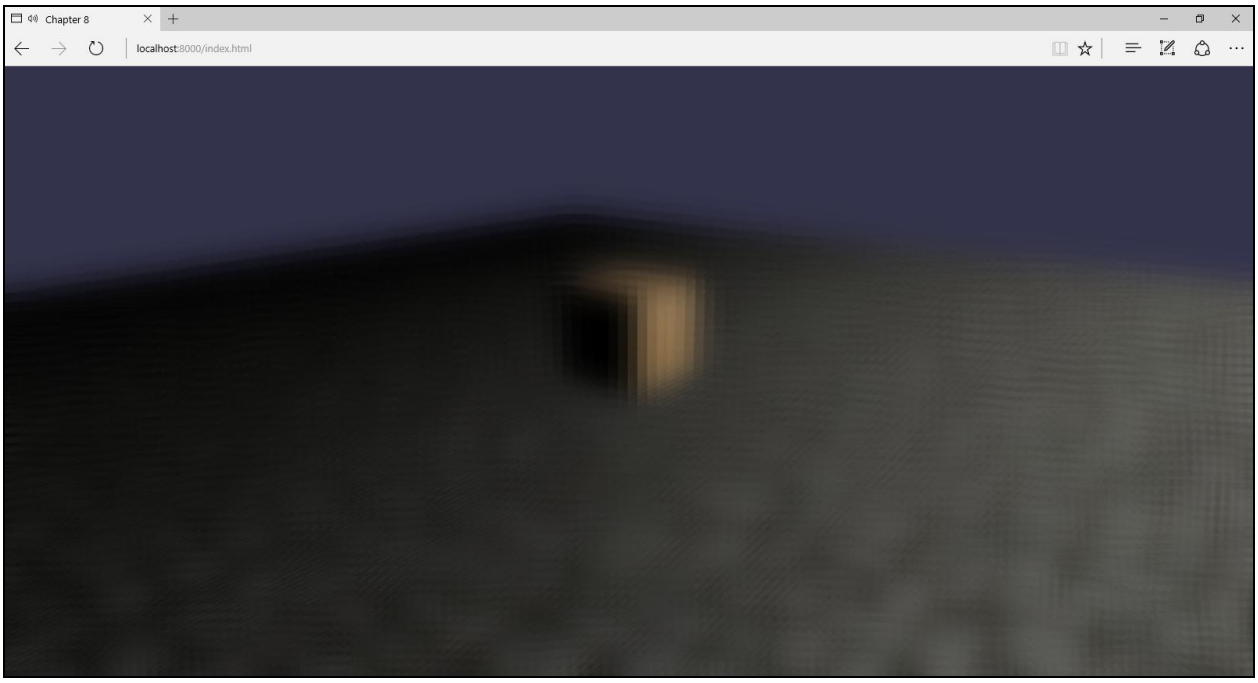
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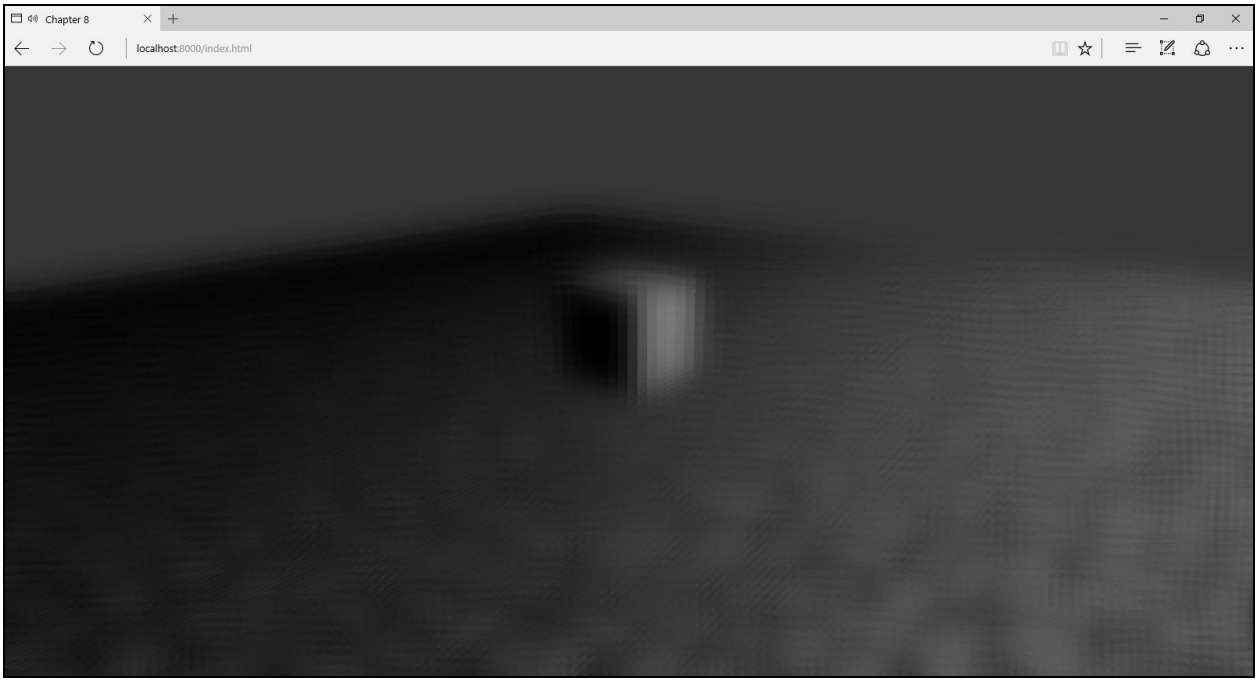
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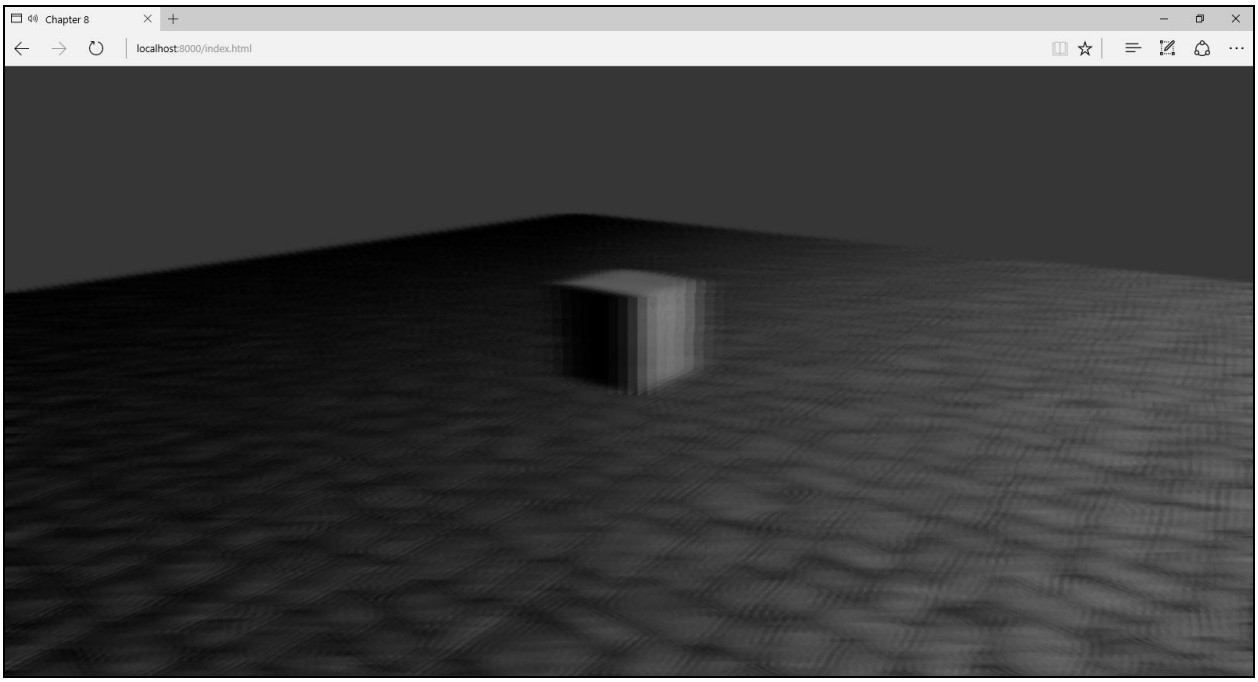
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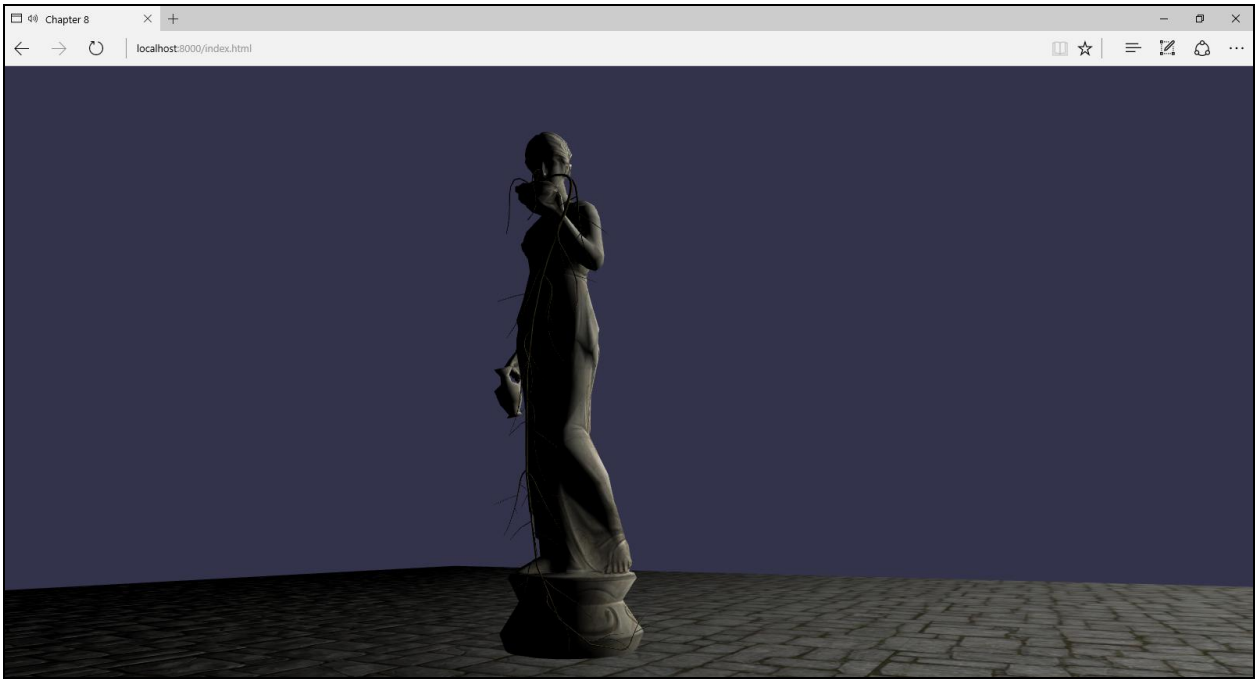
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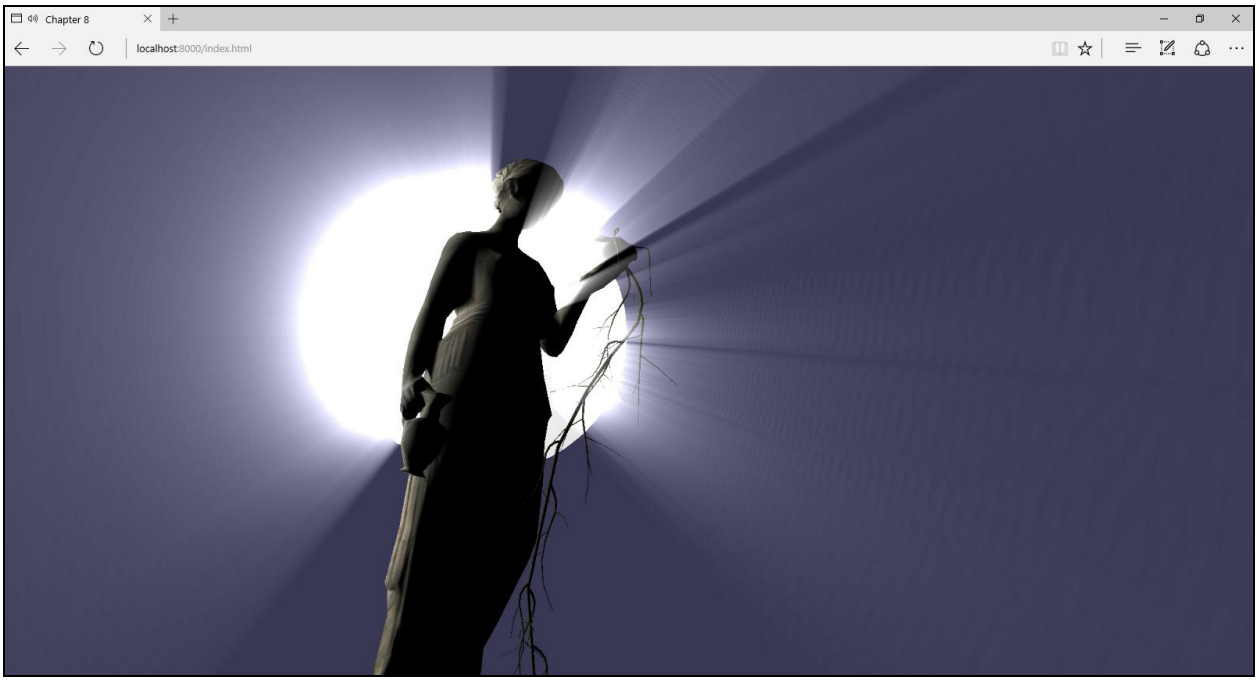
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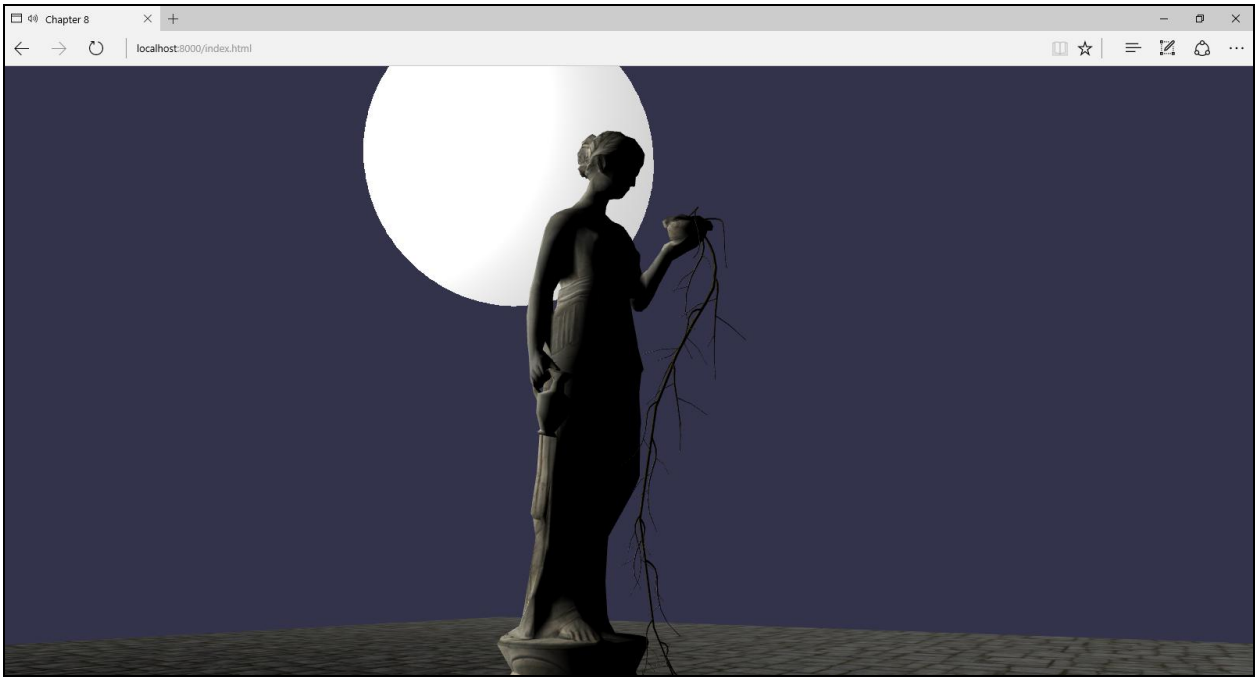
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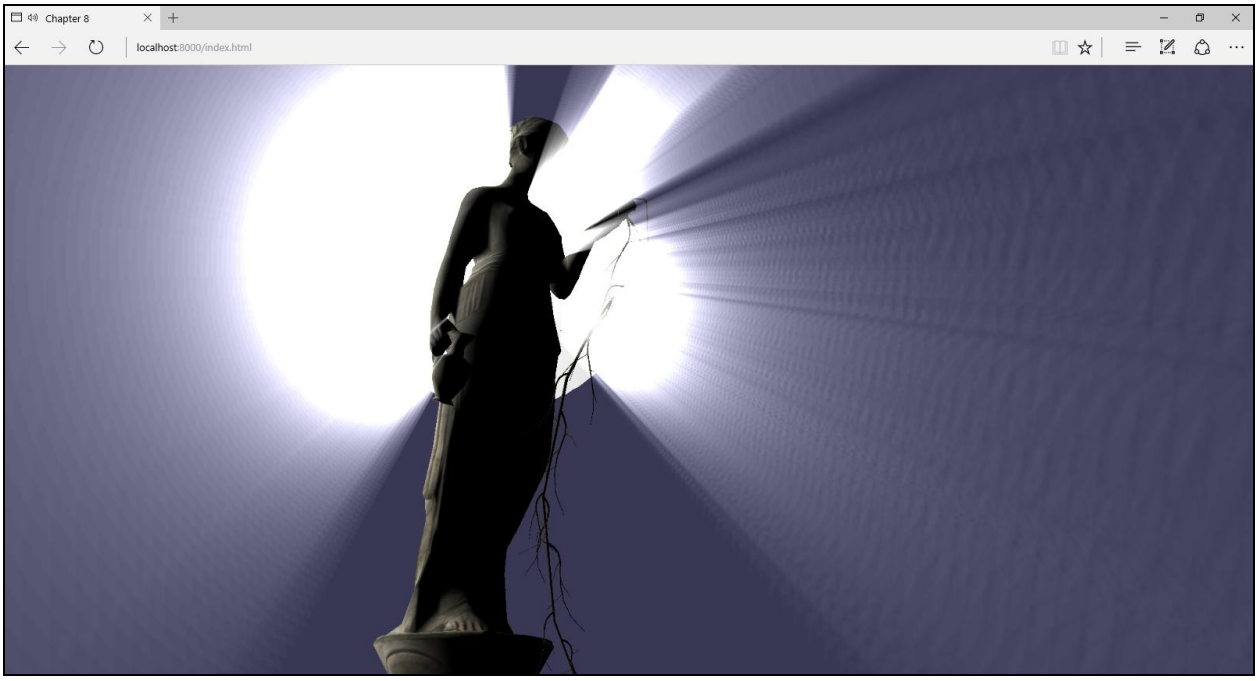
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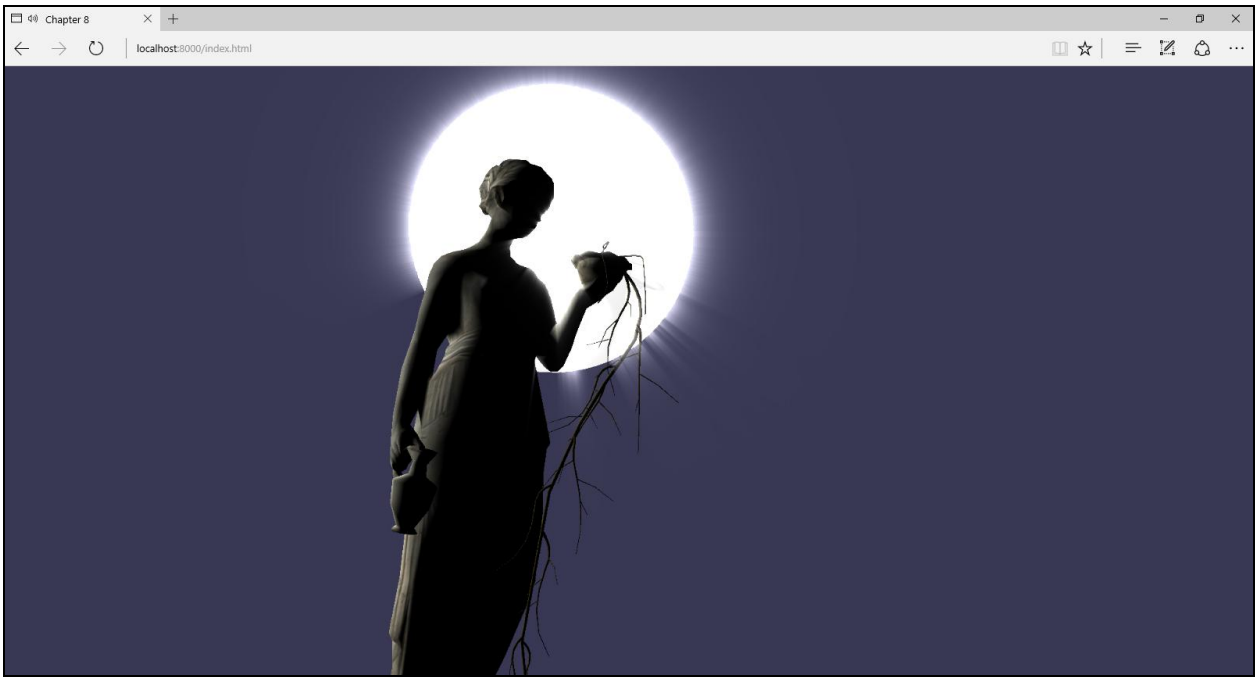
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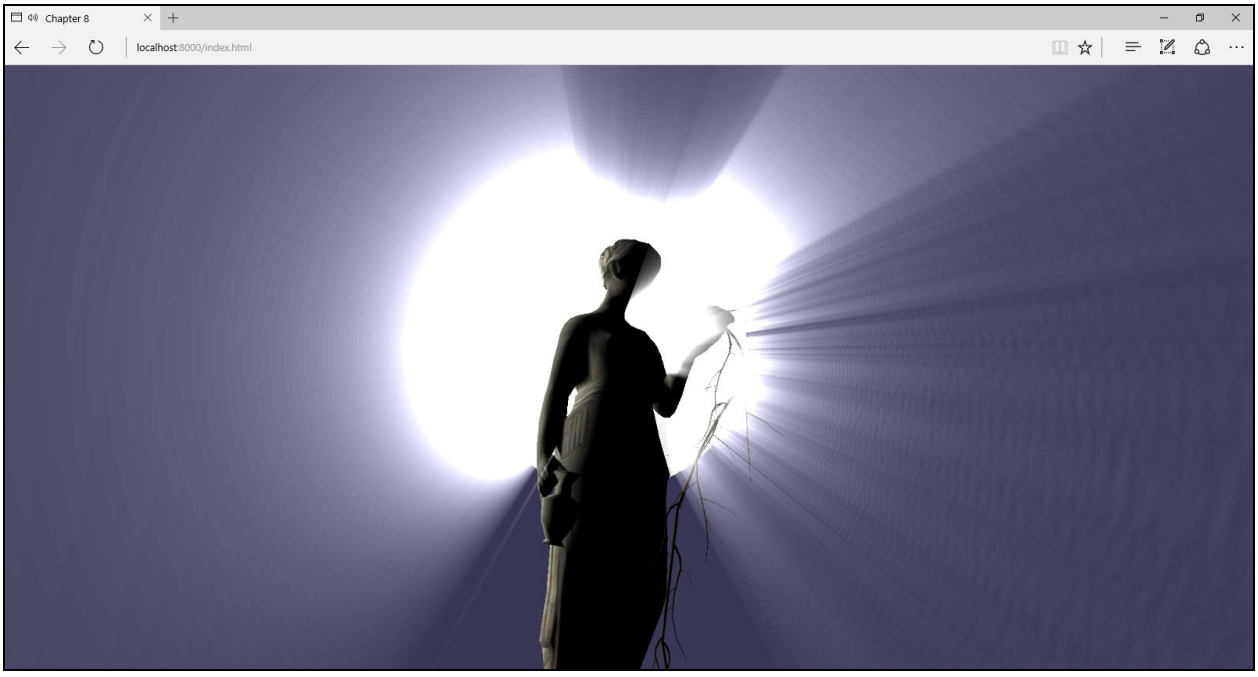
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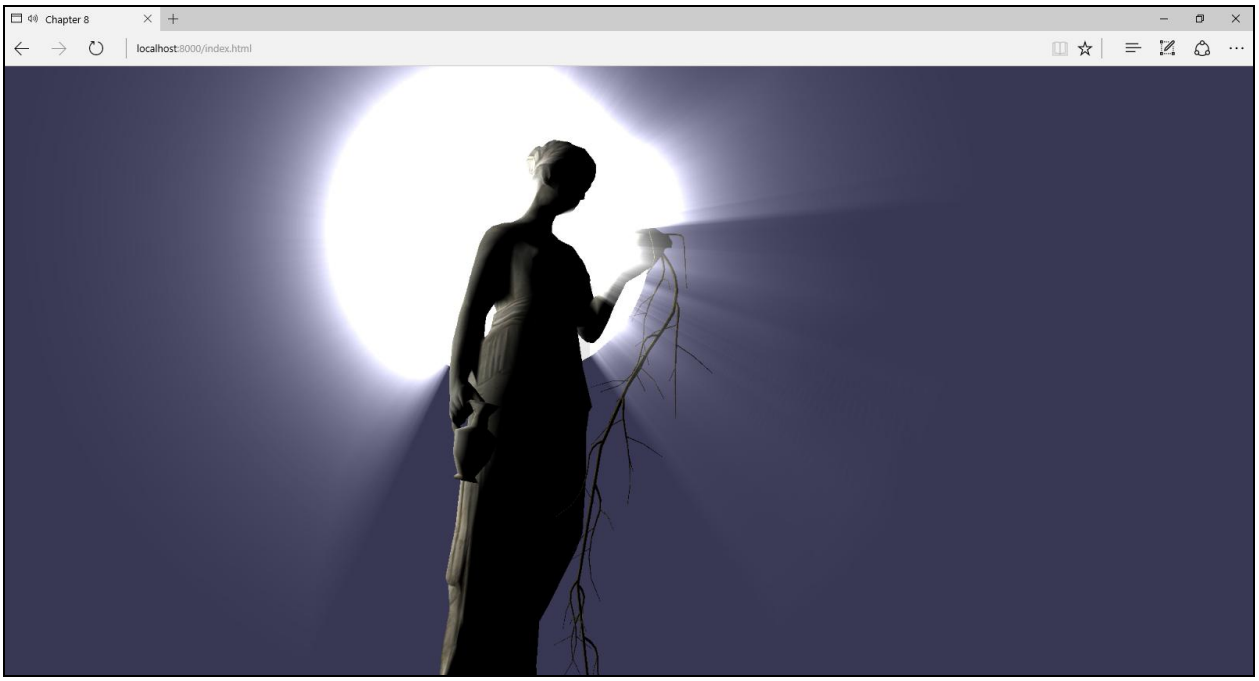
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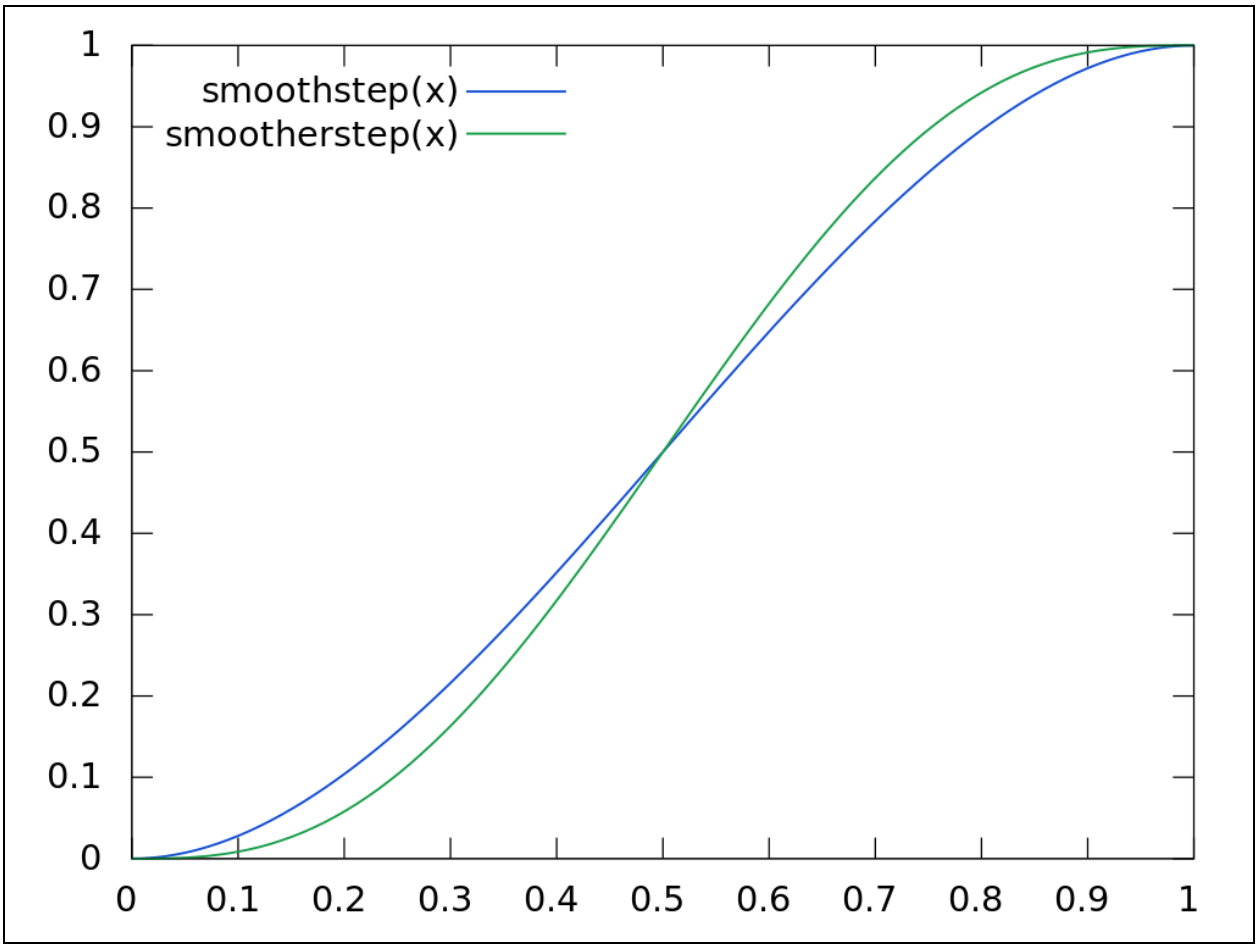
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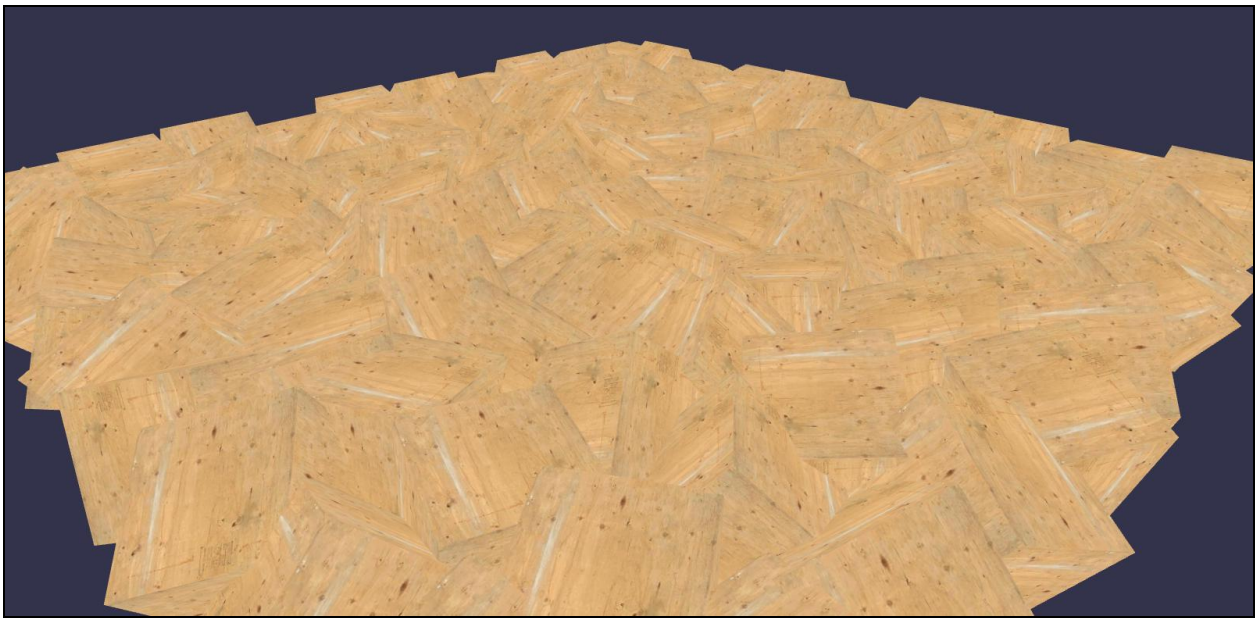

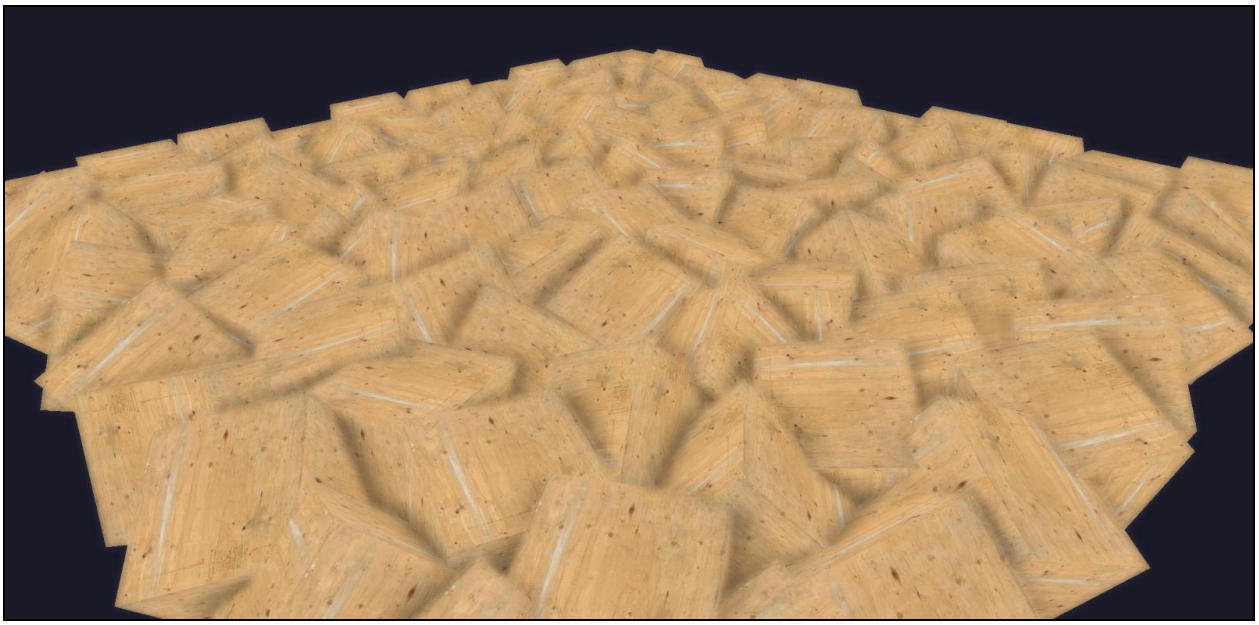

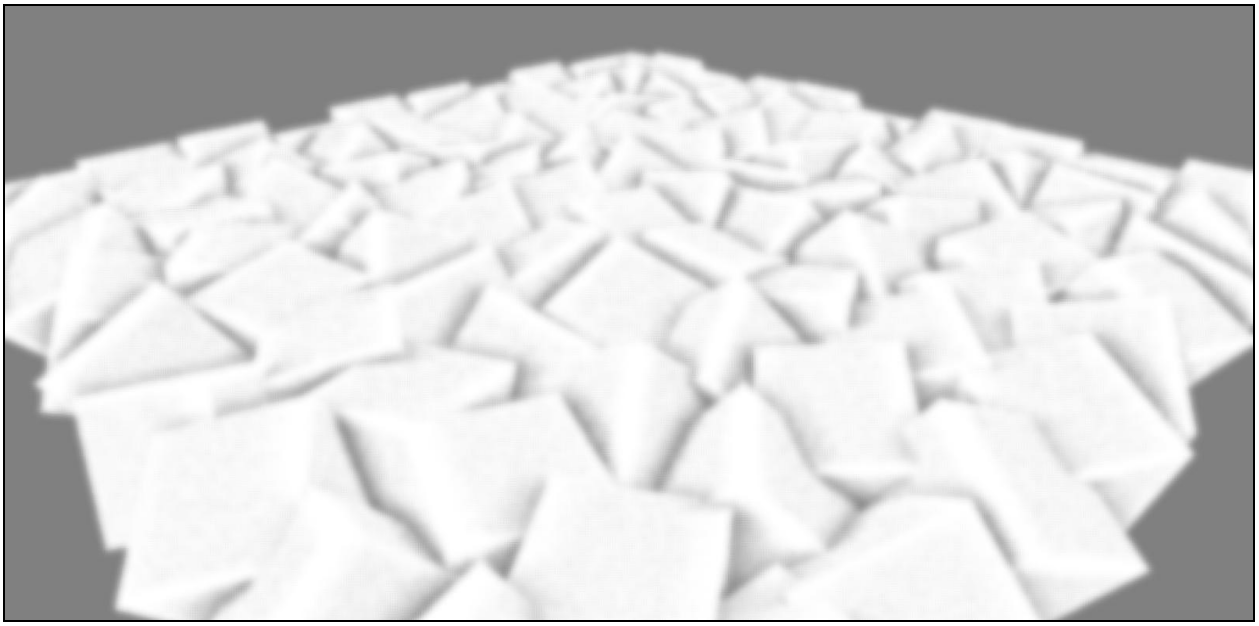

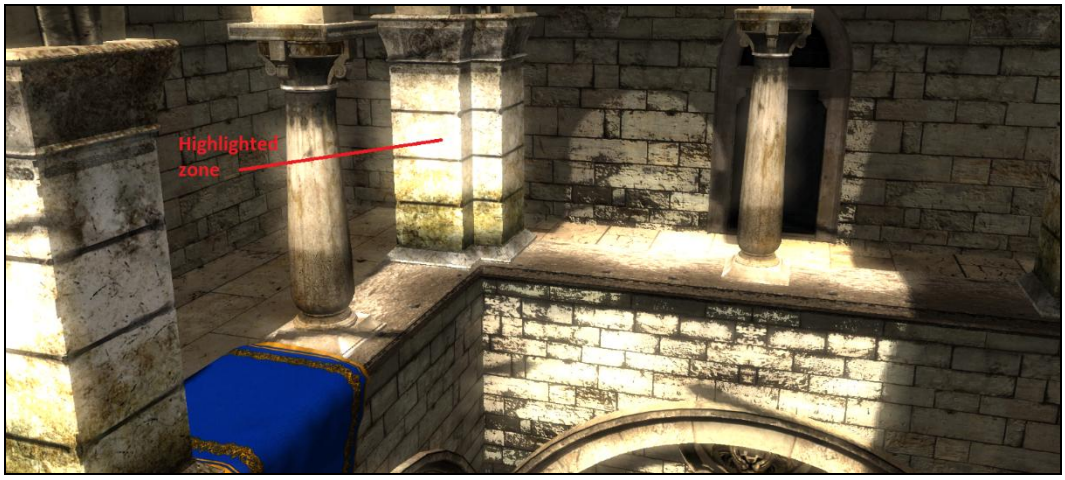
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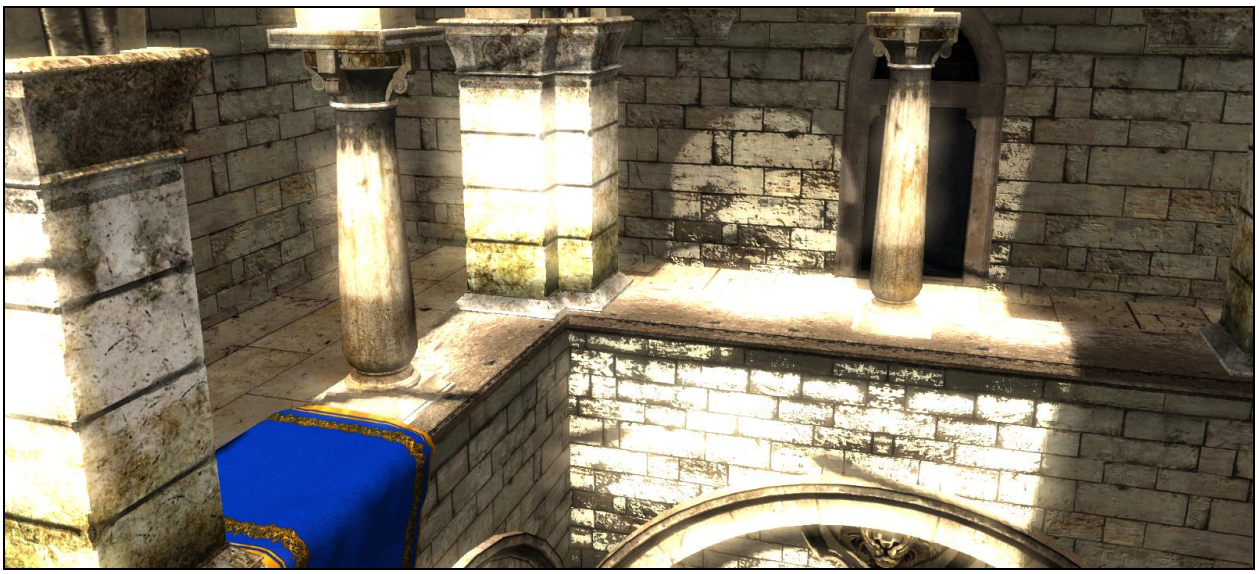

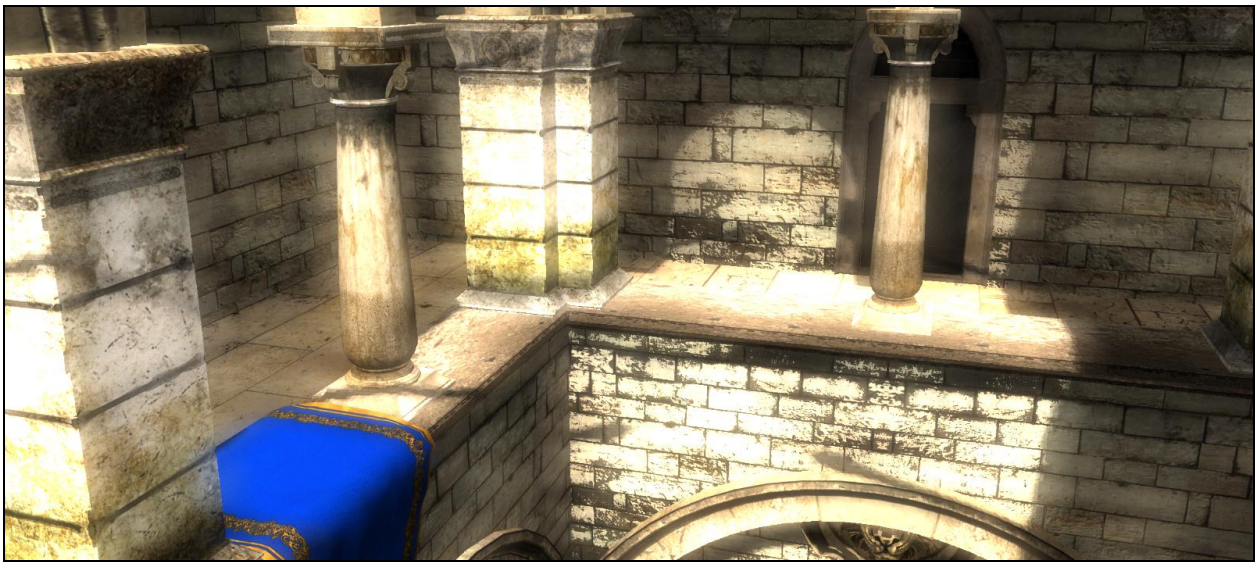

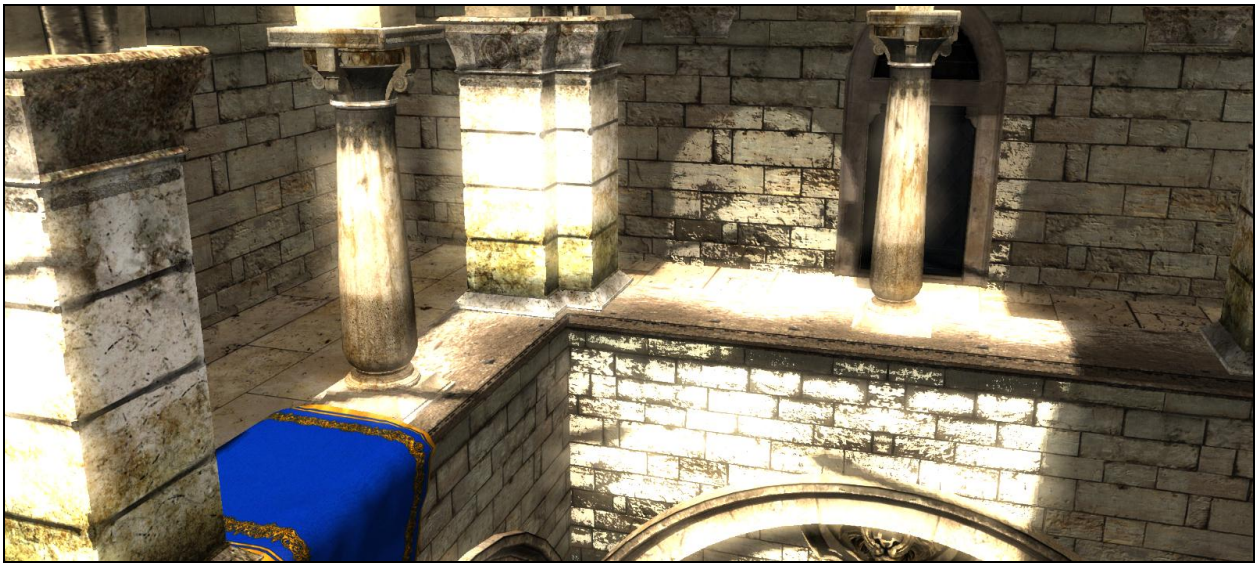

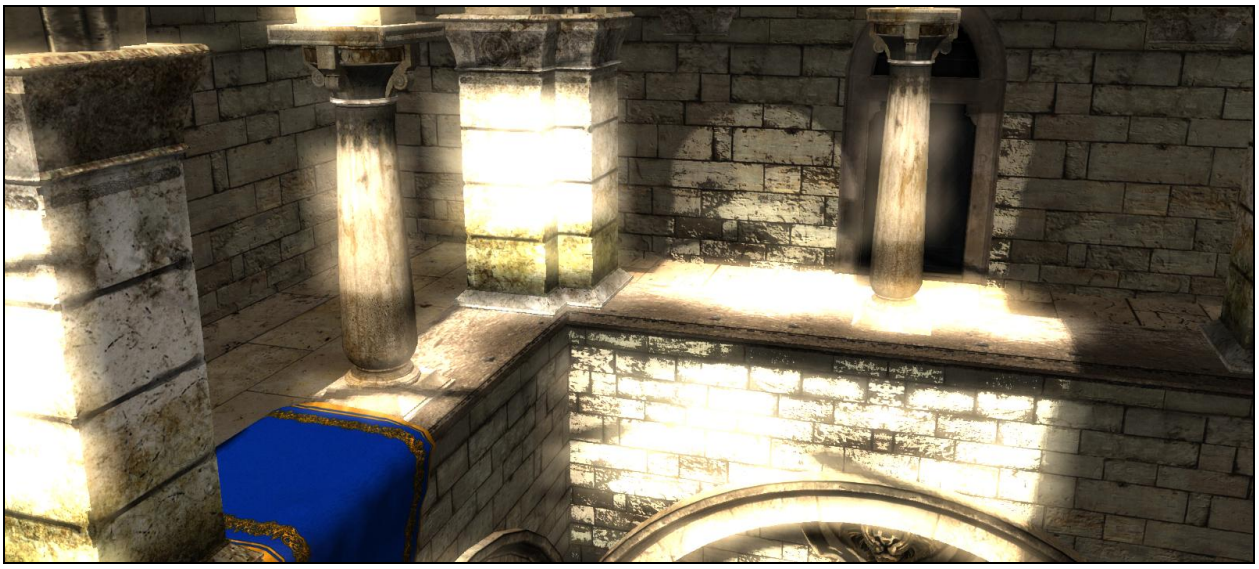
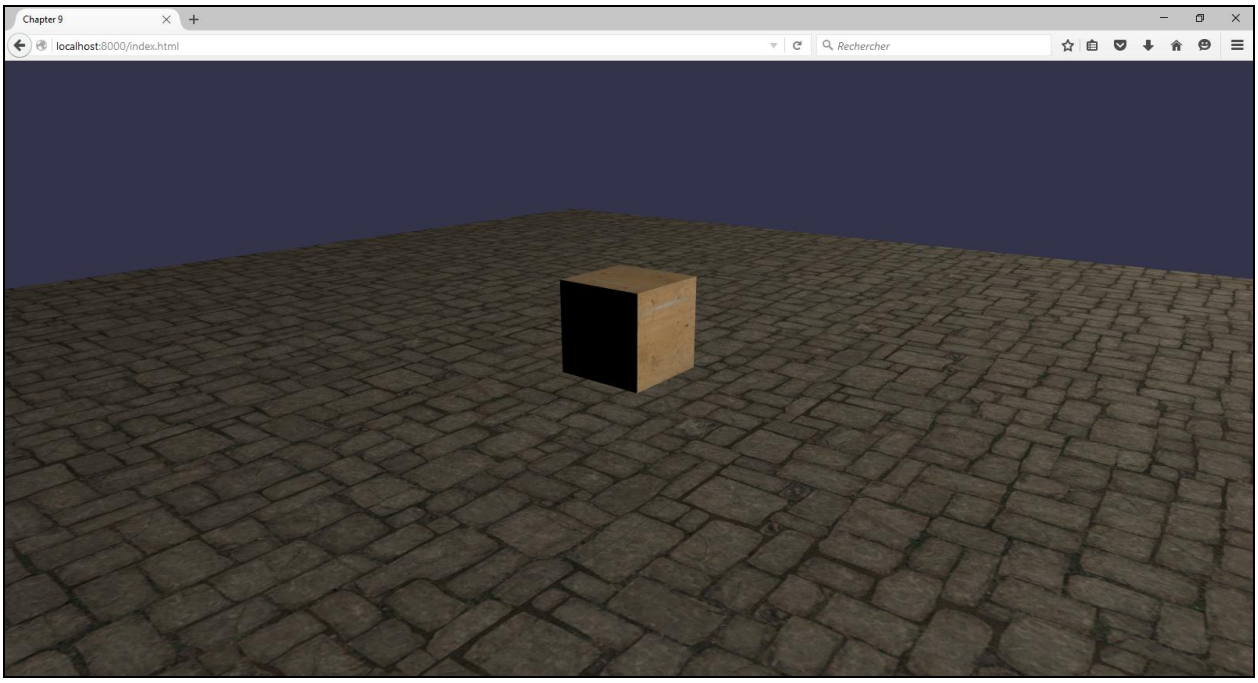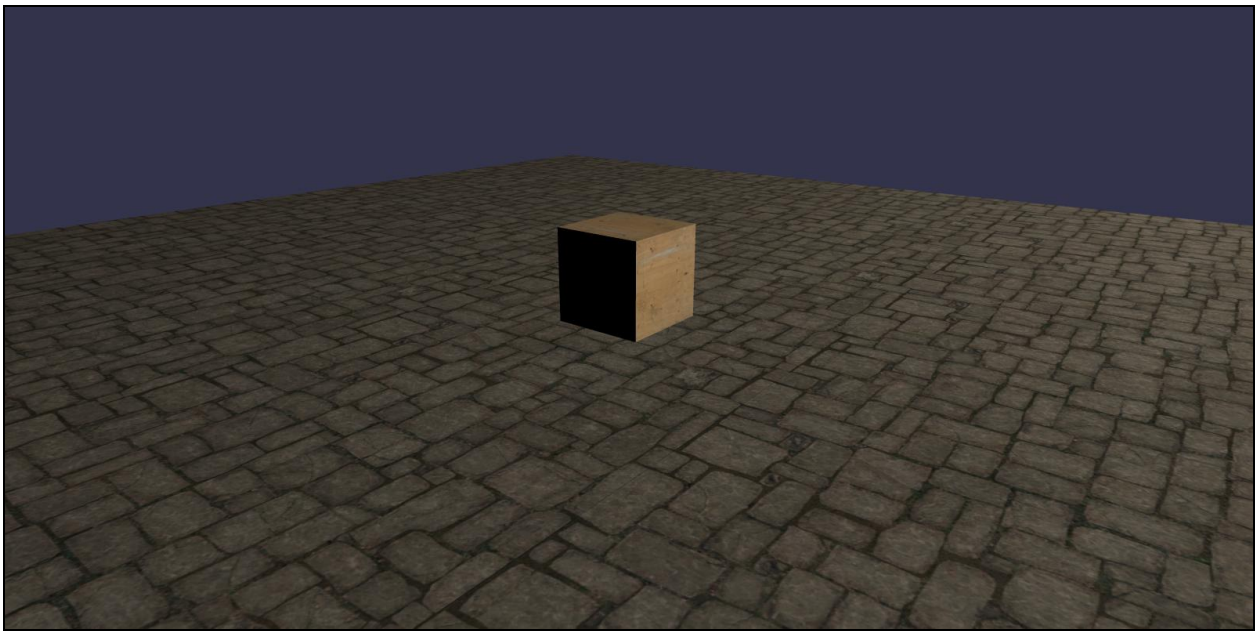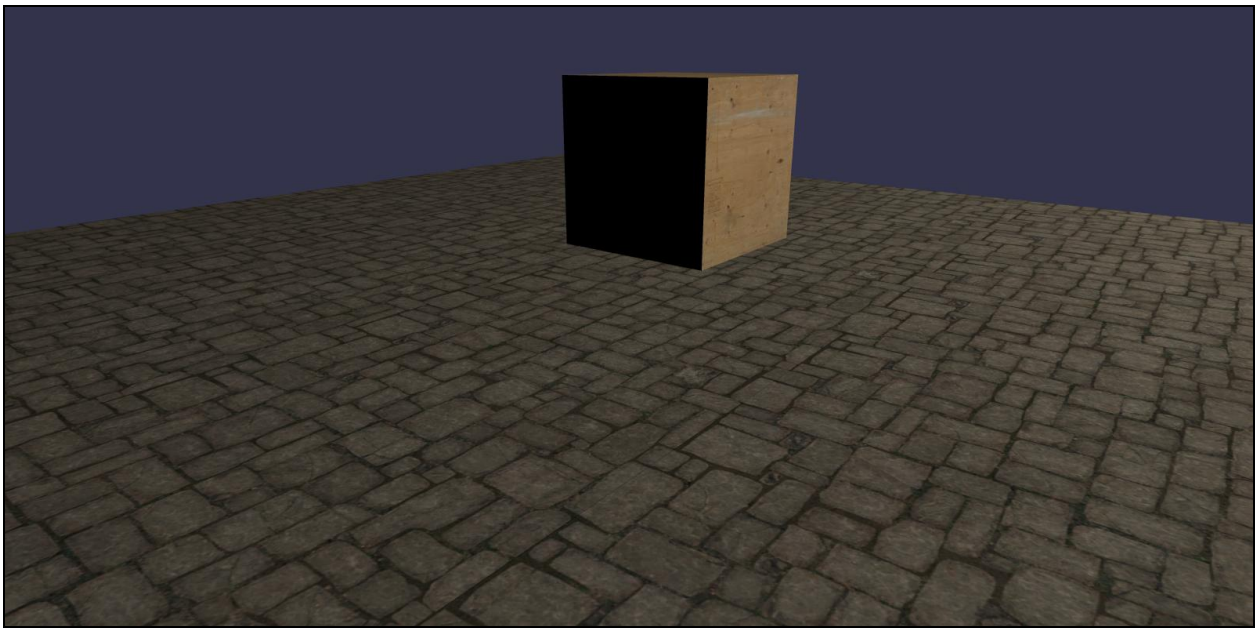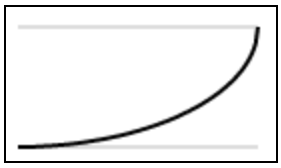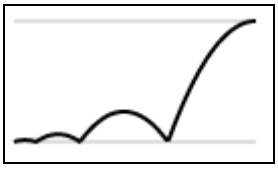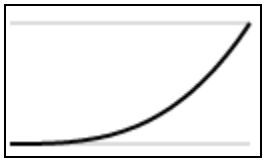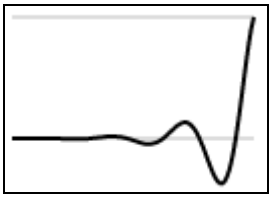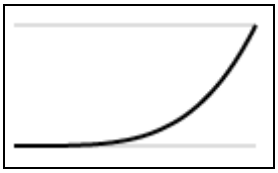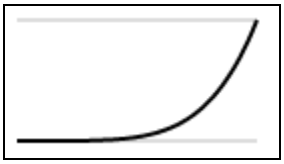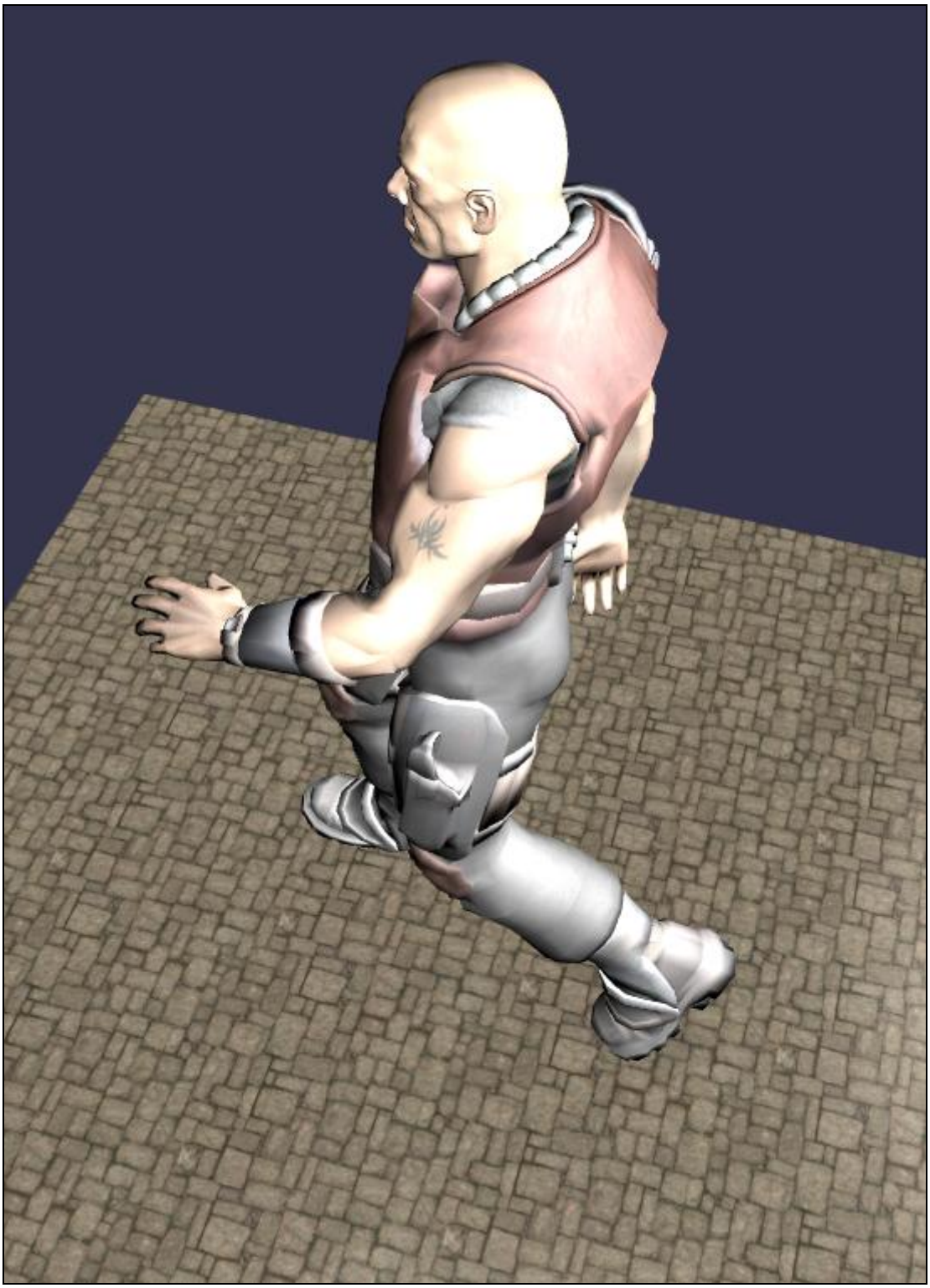
Chapter 9: Create and Play Animations