Tracking

April 10, 2020

Example of using HelioK for scene definition and sun tracking

1 Import

[1]:
```
# install required libraries
#!pip install mathutils
```

[2]:
```
# add search path
import sys
sys.path.append("../source")
```

[3]:
```
# import tracking library
import HelioK as hk
```

2 Scene Python

[4]:
```
# import project from script
hk.Application.file("scene.py", globals())
```

[5]:
```
# export project to xml
app.write("scene.xml")
```

3 Scene XML

[6]:
```
# import project from xml
app = hk.Application.file("scene.xml")
```

[7]:
```
# check sun
sun = app.world.sun
sun.motion.printAE()
```

```
azimuth = 120.000°, elevation = 45.000°
```

[8]:
```
# check heliostat
heliostatA = app.scene.findNode("HeliostatA").getKit(hk.HeliostatKit)
```

```
heliostatA.aiming.point.z
```

[8]: 20.0

4 Tracking

[9]:
```
# set tracking angles
heliostatA.setTrackingAngles(20.*hk.degree, 50.*hk.degree)
```

[9]: True

[10]:
```
# set tracking normal
vNormal = heliostatA.findTrackingNormal()
heliostatA.setTrackingNormal(vNormal, debug=True)
```

```
Solutions:
α = 20.0000°, β = 50.0000°, trackable = True
α = -160.0000°, β = 130.0000°, trackable = False
Selected:
α = 20.0000°, β = 50.0000°, trackable = True
```

[10]: True

[11]:
```
# set sun
sun.motion.setAE(120.*hk.degree, 45.*hk.degree)
heliostatA.setTrackingSun(sun.motion.vector, debug=True)
```

```
Solution 0:
α = -36.9152°, β = 40.6306°, trackable = True, accuracy = 0.0604 m
α = -36.8761°, β = 40.6415°, trackable = True, accuracy = 0.0001 m
Solution 1:
α = 143.0848°, β = 139.3694°, trackable = False, accuracy = 0.0811 m
α = 143.0545°, β = 139.4126°, trackable = False, accuracy = 0.0000 m
Selected:
α = -36.8761°, β = 40.6415°, trackable = True
```

[11]: True

[12]:
```
# update all trackers
app.updateTracking(debug=True)
```

```
HeliostatA
Solution 0:
α = -36.9152°, β = 40.6306°, trackable = True, accuracy = 0.0604 m
α = -36.8761°, β = 40.6415°, trackable = True, accuracy = 0.0001 m
Solution 1:
α = 143.0848°, β = 139.3694°, trackable = False, accuracy = 0.0811 m
```

α = 143.0545°, β = 139.4126°, trackable = False, accuracy = 0.0000 m
Selected:
α = -36.8761°, β = 40.6415°, trackable = True

HeliostatB
Solution 0:
α = -12.3211°, β = 32.1283°, trackable = True, accuracy = 0.0214 m
α = -12.3089°, β = 32.1292°, trackable = True, accuracy = 0.0000 m
Solution 1:
α = 167.6789°, β = 147.8717°, trackable = False, accuracy = 0.0636 m
α = 167.6690°, β = 147.9013°, trackable = False, accuracy = 0.0000 m
Selected:
α = -12.3089°, β = 32.1292°, trackable = True