

Practical Activity

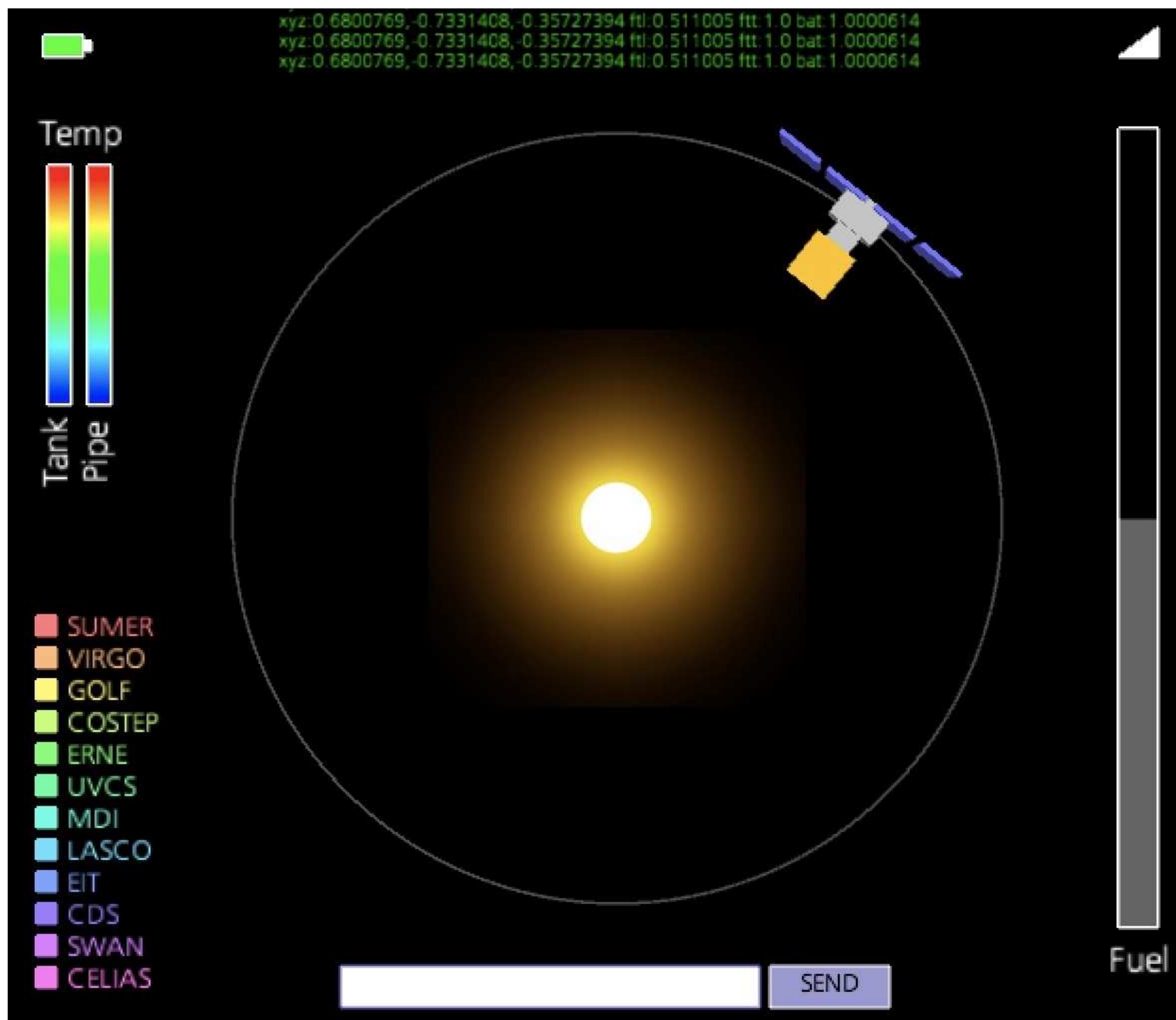
Enough theory and high-level discussion
Let's get hands-on with a practical activity

UNFORTUNATELY

We don't have a real satellite to play with :o(

FORTUNATELY

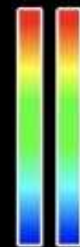
However, since we are Computer Scientists...
We can build a simulator to experiment with !





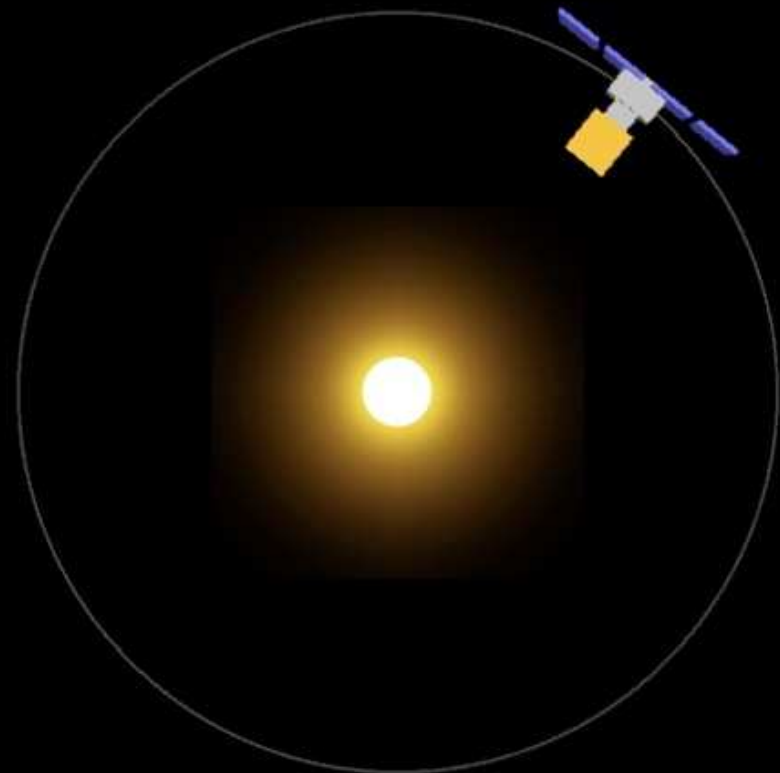
xyz: 0.6800769, -0.7331408, -0.35727394 fti: 0.511005 ftt: 1.0 bat: 1.0000614
xyz: 0.6800769, -0.7331408, -0.35727394 fti: 0.511005 ftt: 1.0 bat: 1.0000614
xyz: 0.6800769, -0.7331408, -0.35727394 fti: 0.511005 ftt: 1.0 bat: 1.0000614

Temp



Tank
Pipe

- SUMER
- VIRGO
- GOLF
- COSTEP
- ERNE
- UVCS
- MDI
- LASCO
- EIT
- CDS
- SWAN
- CELIAS



Fuel

SEND

Warning

Note that this simulation is an *approximation*
(not everything is scientifically accurate)

We've made some compromises to make it usable:

- Scale: can't fit 150 million km on the screen
- Time: sped up animation to reduce waiting time
- Dimensions: 2D rather than 3D for easier interaction
- Commands Simplified: to make more understandable

Simulator can be downloaded from here:

<http://people.cs.bris.ac.uk/slock/solar>

Written in Processing

But exported as an application !

Download it, UNZIP IT, run it:

SatelliteController

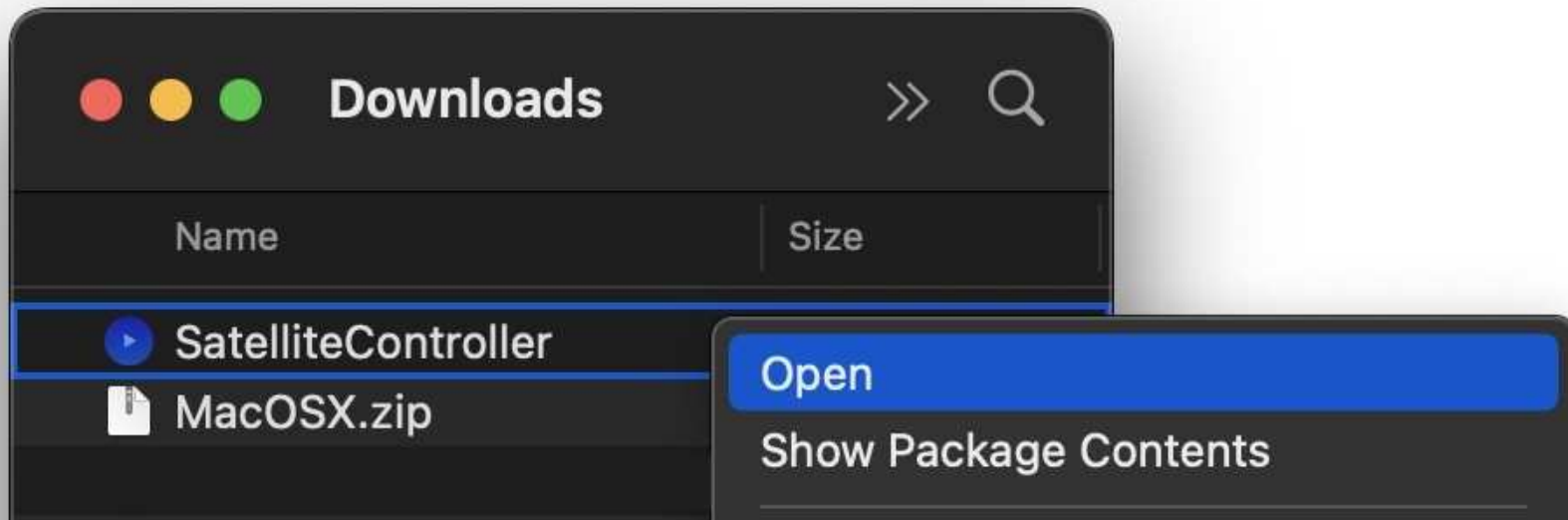
Let's explore the command set
(when everyone is ready !)

Windows Security



MacOSX Security

CTRL-Click on the SatelliteController file
Then selection "Open" from the menu



Available Control Commands

SatelliteController

Science Experiments

Satellite carries a range of scientific experiments
We won't explore the nature of these experiments
They are space science, this is computer science

We switch OFF/ON all science experiments using:

SCI0

SCI1

Useful if we need to save some power, however...
Scientists won't be very happy if we leave them off

WARNING

We are about to see some navigation commands
It is ESSENTIAL that we are VERY careful with these
We MUST NOT let satellite get out of alignment
Move too much and we will lose solar power
As well as radio signal antenna alignment

Be careful

Only move by small amounts
Always move back again afterwards

Navigation

Before navigation, we MUST switch on Gyroscope

GYR1

We can then change the "pitch" of the satellite

PIT15

PIT-5

As well as the "yaw"

YAW-20

YAW10

Why not all try these now ?

Careful with fuel consumption!

Sun Reacquisition

Due to all our previous manual navigation...

The satellite can quickly become out of alignment:

- Alignment with the Sun (for solar power)
- Alignment with the Earth (for radio control signals)

Luckily satellite provides an "auto pilot" feature:
"Emergency Sun Reacquisition"

ESR

Resets the satellite to the correct orientation

Why not try this now ?