GET STARTED WITH THE SIMULATION TECHNOLOGY MODULES

JOHAN JANSSON

Welcome to the Module part of the Simulation Technology educational material. We divide the content of the Simulation Technology Program into course *modules*, each representing an important abstract concept, for example the fundamental theorem of calculus (integration) or partial differential equations, and includes reading instructions, software interfaces and libraries and examination questions. The idea is that this structuring of the material will help expose that there are only a few but very powerful important ideas in simulation technology that allow you to model and controllably simulate phenomena in nature.

All the software used in the course is open source, meaning that you can **inspect** it to understand/verify how it works, **modify** it to suit your particular needs, and **distribute** the software to friends and possible future colleagues, allowing you to continue using and basing possible future endeavors on the software.

Each module contains:

Reading references: Important chapters of the explanatory text that are necessary for the module.

Introductory text: A very short summary of what the module is about and the main concepts.

Software library and interface specifications: Interfaces and instructions how to use existing open source software libraries necessary for the module. You must follow the interface specifications to complete the examination questions.

Examination questions: Questions that you submit and which are graded for examination. These are composed of pen and paper questions and computer language functions which you must write and/or call.

1. How to get started

The latest version of all course material can be found on the DN1240 course home page

In this tutorial we will assume you want to work by login in remotely to the computer `u-shell.csc.kth.se`. NB: you need to use your CSC username and account. We assume you are locally working on a machine with a Unix-style SSH shell and X Window server (Linux, Mac OS X, or Microsoft Windows with Cygwin/X installed). We will support logging in to `u-shell.csc.kth.se` or logging in to the Ubuntu lab computers. You can also run this locally on your own computer/laptop, but we cannot help you with support how to setup your environment. You can study the environment on the `u-shell` computer for the required packages/versions.

Login:

```
ssh -XC csc-username@u-shell.csc.kth.se
```

Mathematical Simulation Technology.

Get module:

```
wget http://www.csc.kth.se/utbildning/kth/kurser/DN1240/
numfcl10/kursmaterial10/M1-fundamental.zip
```

Unzip and enter directory:

```
unzip M1-fundamental.zip
cd M1-fundamental
```

Look at instructions:

```
xpdf M1-fundamental.pdf &
```

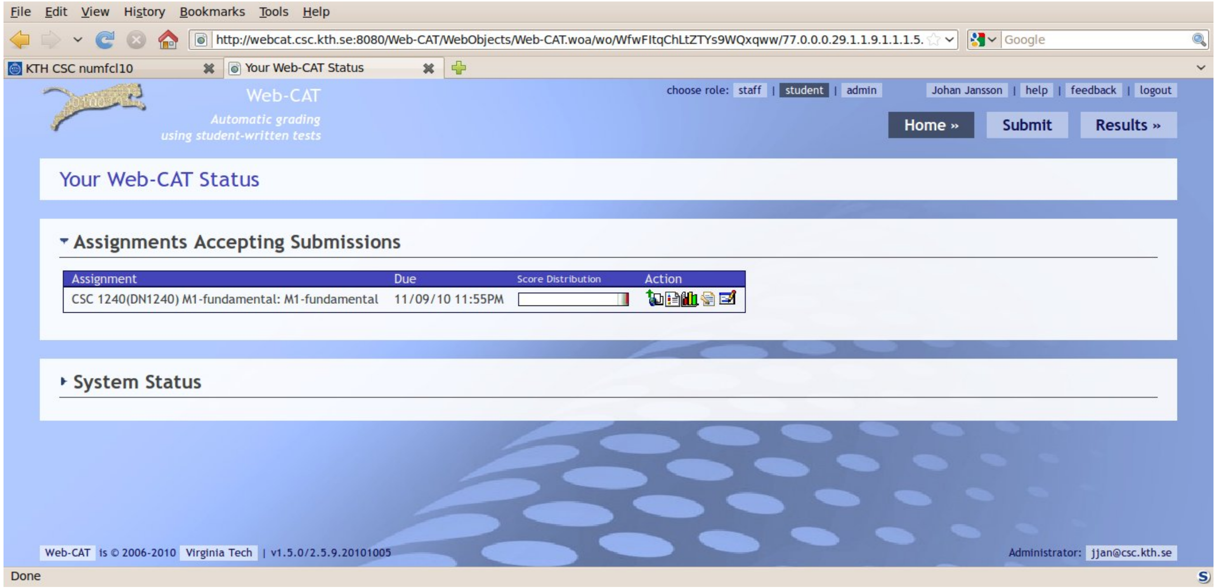
Run "game" tutorial:

```
cd game
python particle_simulator.py
```

If you are working on an Ubuntu lab computer, you can skip the first step involving `ssh`.

2. Examination

Each module contains a number of examination questions. The answers should be submitted through our Web-CAT (webcat.csc.kth.se) open source automated checking system:



File Edit View History Bookmarks Tools Help
Google
KTH CSC numfcl10
Your Web-CAT Status
choose role: staff | student | admin
Johan Jansson | help | feedback | logout
Home »
Submit
Results »
Done

http://webcat.csc.kth.se:8080/Web-CAT/WebObjects/Web-CAT.woa/wo/WfwFItqChLtZTYs9WQxqww/77.0.0.0.29.1.1.9.1.1.1.5.

Web-CAT

Automatic grading using student-written tests

Your Web-CAT Status

Assignments Accepting Submissions

Assignment	Due	Score Distribution	Action
CSC 1240(DN1240) M1-fundamental: M1-fundamental	11/09/10 11:55PM		

System Status

Web-CAT is © 2006-2010 Virginia Tech | v1.5.0/2.5.9.20101005

Administrator: jjan@csc.kth.se

2.1. **Instructions.** See the nice tutorial video how to submit an assignment to Web-CAT. The video has a slightly older/different interface than our Web-CAT environment, but the functionality is the same. For the automated checking to work, it's very important that you name your submitted file according to the instructions ("fundamental.py" for M1), and that you follow the software interfaces. If you did not get a full score, you can resubmit as many times as you like (observe deadlines however).

3. Software Dependencies

If you wish to carry out the module work locally on your own computer/laptop, it is possibly to download and install all the software dependencies since the software is open source. On Ubuntu

Lucid (same as the supported environment) this should be relatively painless to do by yourself. However, on other operating systems or versions of Ubuntu/Linux, installing all the software yourself could possibly be quite a bit of work, and we recommend either using the Ubuntu lab computers or working remotely against the `u-shell` computer via SSH. We are considering a Live USB/DVD distribution which would allow you to reboot into a local installation of the environment, contact us if you're interested in this.

This is the current list of software dependencies (as of 2010-10-25):

- Python (2.6)
- Panda3d(1.7.0)
- NumPy (1.3.0)
- Pylab/Matplotlib (0.99.1)
- SciPy (0.7.0)
- scikits.ann (1.3.40)
- FEniCS (DOLFIN 0.9.7 + all dependencies)