Here is your assignment attached below.

Please, contact **Marit Bakkejord** in “studieadministrasjonen”, to formally register for re-examination. I will also inform her.

Submission deadline is 15. December to Tanita Fossli Brustad [tanita.f.brustad@uit.no](mailto:tanita.f.brustad@uit.no),  and re-examination will take place 19. December (sometime after the other exam).

Please see me at my office to get the robotic arm.

Mvh

Børre Bang

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STE6249-002

Virtual reality / Graphics / Animation

Assignment

Use C++ to build an *interactive, visual simulation of a given robotic arm*, under the constraints of actual servos and geometry.

Make it draw squares.

**Reqirements**

Use GMlib or Bullet and Qt as frameworks for visualization and computations.

Use Qt for UI tasks such as mouse and keyboard events.

Other libraries and software only after agreement with supervisors.

**Hexapod**

The given robotic arm is made of components from “Lynxmotion”. Physical model will be provided.

The virtual model should resemble the actual model as close as possible, given the time-frame allotted to the project.

**Physics**

The model must be presented as a hierarchical linkage construction working under physical constraints as external forces and gravity.

The motion should be generated by sending impulses to the servos.

**Navigation**

Implement navigation and control via user interface (mouse/keyboard). The robotic arm should at least be able to turn all its joints under interactive control. It should also be able to move according to a predefined sequence.

**Attribution**

Ideas, code and models can be taken from other places, however it is required to include credits to them in the report (references).

**Extras**

* + Drawing of more general geometry
  + Smooth transitions between states
  + Pickup of tools (pencil, pen)
  + Add sensors
  + Virtual intrumentation for;
    - Velocity and acceleration plots
    - Energy consumption plots
    - Repeatability and accuraccy measures
    - H/W in the loop simulation
  + Eye-candy
    - Textures
    - Motion blur
    - Lights
    - Shadows… etc.

**Report**

The report should include:

* An introduction of the assignment.
* A description of the submission, list of features of the application.
* A description of any eventual extra credit.
* Known problems with the code or challenges during the project
* References (books, papers, websites, etc.) that you found helpful for completing the assignment.
* The report should be formatted as a short paper, maximum 8 pages.
* LaTex is recommended.