Week 1: 03-20 to 03-23

Pendubot
Progress report 1

1. Recall of the objectives:

- Do the schedule
  - Establish the list of the task
  - Schedule the tasks

- Modelisation of the Pendubot
  - Define the parameters
  - Establish the equations
  - Validate the model

- Get familiar with the equipment
  - Identify all the elements
  - Manage to communicate with the Pendubot

- Start the webpage
  - Do a description of the webpage
  - Start to build it

2. Achieved work:

- Establishment of the schedule and the objectives of the week

- Definition of the parameters

- Determination of the non-linear model
  → Computation of the equations
  → Validation of the model with Simulink

- Establishment of the control strategy
  We need to linearize the model

- Linearization of the model
  → Computations of the equations
  → Validation with Simulink
  We obtain similar results with the non-linear and the linear model

- Implementation of the controllers for the up-up and down-up positions
  → We implemented a Matlab program that gives us the coefficients of the feedback control loop for any position of the inner link. We used a

LQR controller. We are now able to stabilise the upper link in a vertical position for every value of the angle of the inner link.

We validated those results with Simulink simulations

- First contact with the equipments

  We manage to communicate with the Pendubot. The data acquisition is working. We managed to have access to all the state variable we need.

- Description of the webpage and beginning of implementation

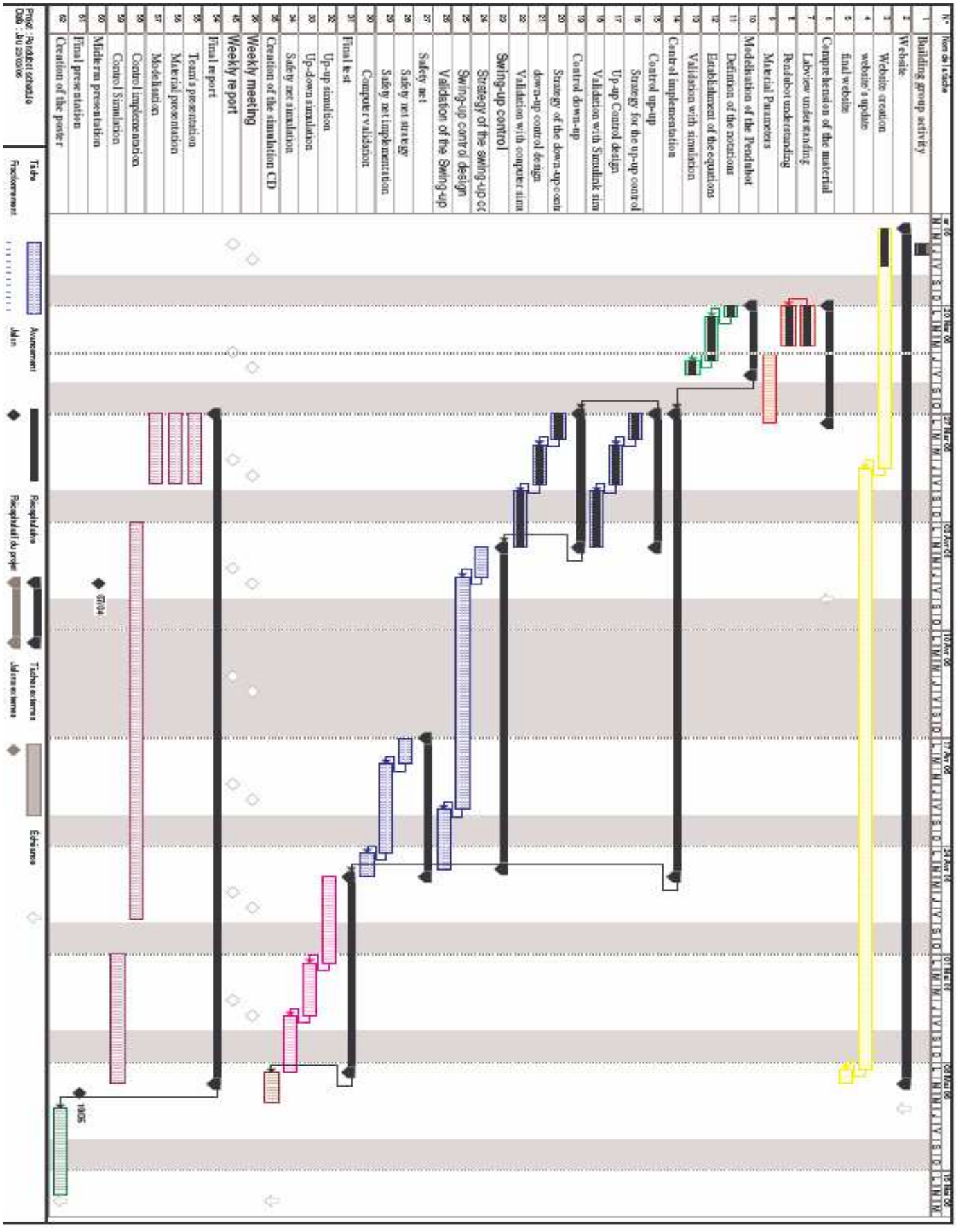
3. Problems:

No major problem this week

4. Objectives of next week:

Now that we have implemented the controllers, we would like to start the simulations on the real system. The main objective will be to obtain the Labview version of our model.

5. Global progress of the project *(Schedule's update)*



Conclusion:

The project is going very well. We didn’t have so many big problems so far. The team is very motivated and we are planning to do more team building activities soon.