# DIY Arduino Arm autosampler

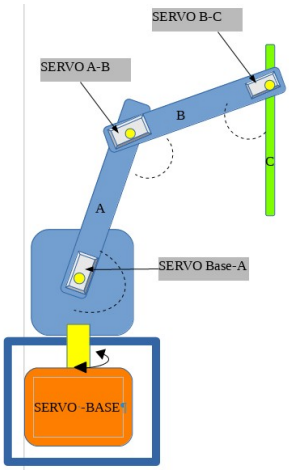
## ***Target***

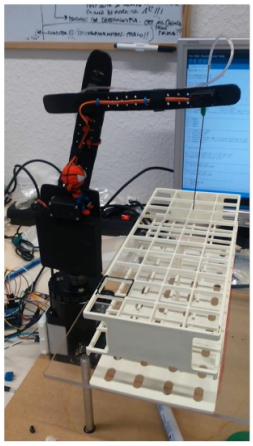
*Automate a sampling process for a custom analytical equipment:*

*~Easy and cheap construction.*

*~Adaptable to sample container dimensions*

*~Adaptable to any kind of rack (n rows-cols)*



***DIY mentality***, *and Arduino. Code with fixed values uploaded to the memory of the board.*

*XYZ samplers are more easily operated and automated, but imply a more complex structure and expensive motion control hardware by using stepper motors, chains, frames etc. Therefore a* ***single arm with 3 joints, on a rotating platform*** *as base, is the goal.*

## Hardware

***Servomotors*** to control joint's angles, used for drones, as torque was not key, and servos are pretty lightweight. They cost from 2 to 6 € each. I bought (different sizes):

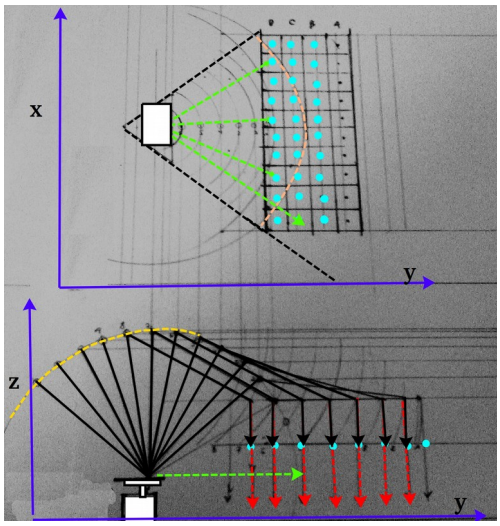
- 1 for the rotation of the base XY plane.
- 1 for angle base-A
- 1 for angle A-B
- 1 for angle B-C

**Arduino UNO** board was used to control all the servos, with external 5V power supply for the servos.

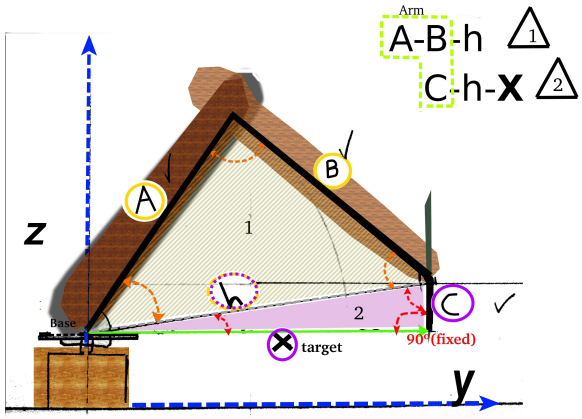
The ***structure*** was made with ***laminar wood sheets 4mm thick***, as the pieces may hold everything summing up a very light final weight.

## Approach

Based on triangles and ***Pitagoras***. I started with some drawings and sketches to clear my mind up and identify the movement for the sampler.




Down here my approach about How to calculate the angles for each segment according to the target I wanted to reach, taking into account segment C is always parallel to Z axis.




After some 'DIY' with the wood, saw, and black paint, hands on ***coding the proces:***

***code: armDduinoSampler.ino***

***https://github.com/JPBaro/arm-Duino-sampler***

***Videos:***

***https://www.youtube.com/watch?v=0gh_hbvY0N4***

***https://www.youtube.com/watch?v=ovMHvq_Vp3Y***