Beta-NMR Beamline

Our small part in the bigger project

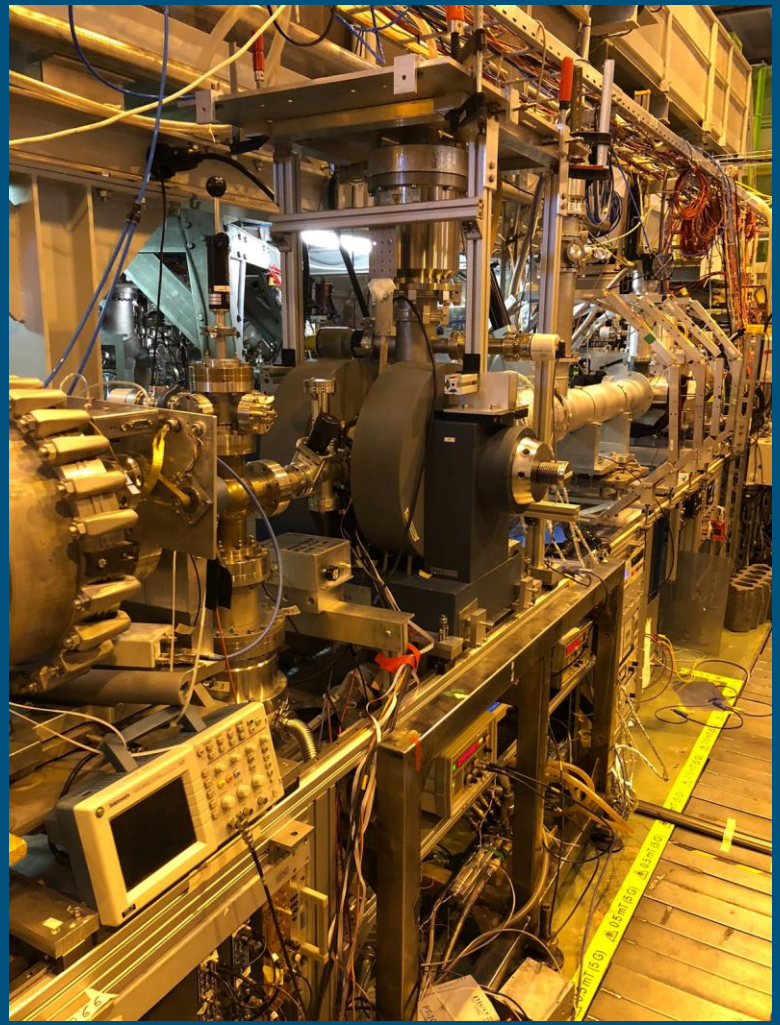
VITO

Interacts with larger biomolecules

Quick analysis of molecule by studying the electromagnetic environment of the nucleus

Long term goals:

Quickly analyse conformation, content and changes in DNA structure



Beta-NMR

Use lazerpolarised radioactive ionbeams to change magnetic spin in rare isotopes

Uses magnetic resonance in the nuclei to analyse type of nuclei in larger molecules

High precision

Very specialised

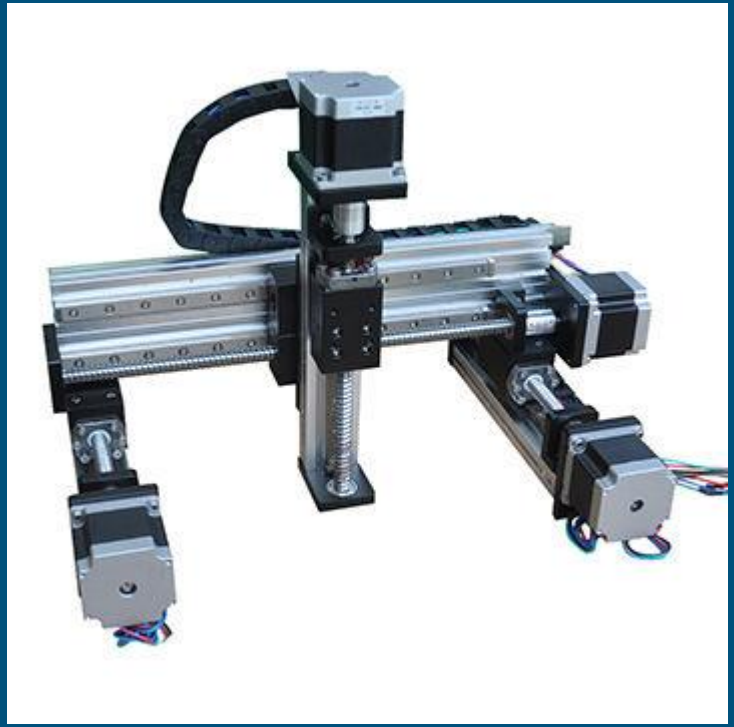
Our part

Under the supervision of Jared Croese, Magdalena Kowalska and Fredrik Parnefjord Gustafsson

Develop a magnetic field mapping device

Required to be able to measure every point in the field

3D stage, consisting of motors



Step 1

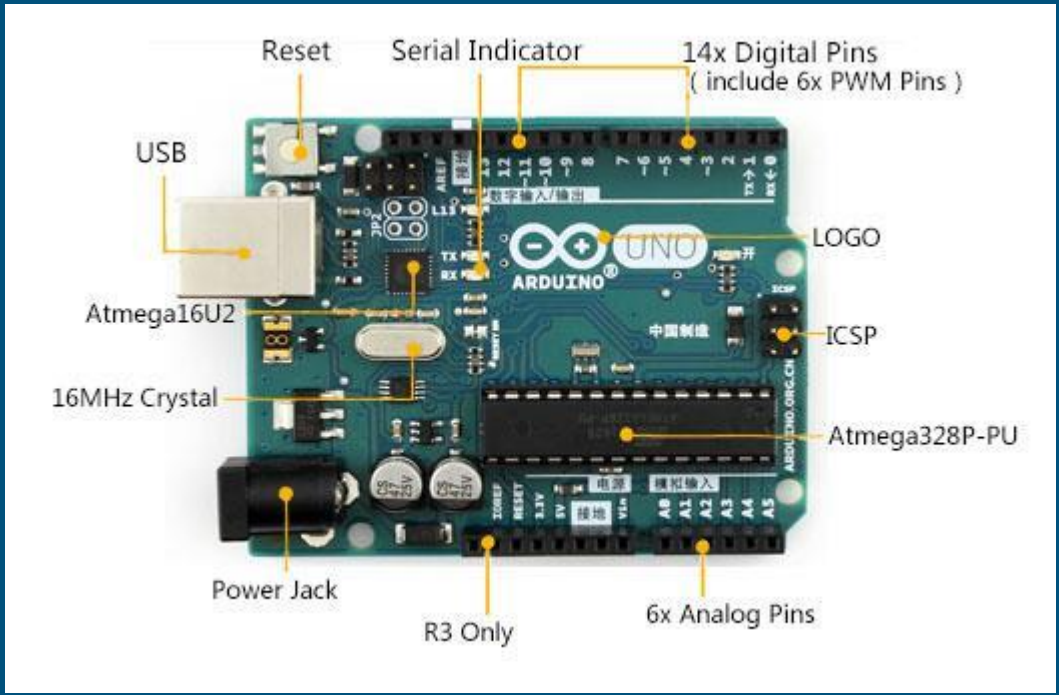
We didn’t know programming, had no former experience

Had limited knowledge of electrical circuiting

Arduino

micro processors

Started Learning from scratch, by following examples and expanding them

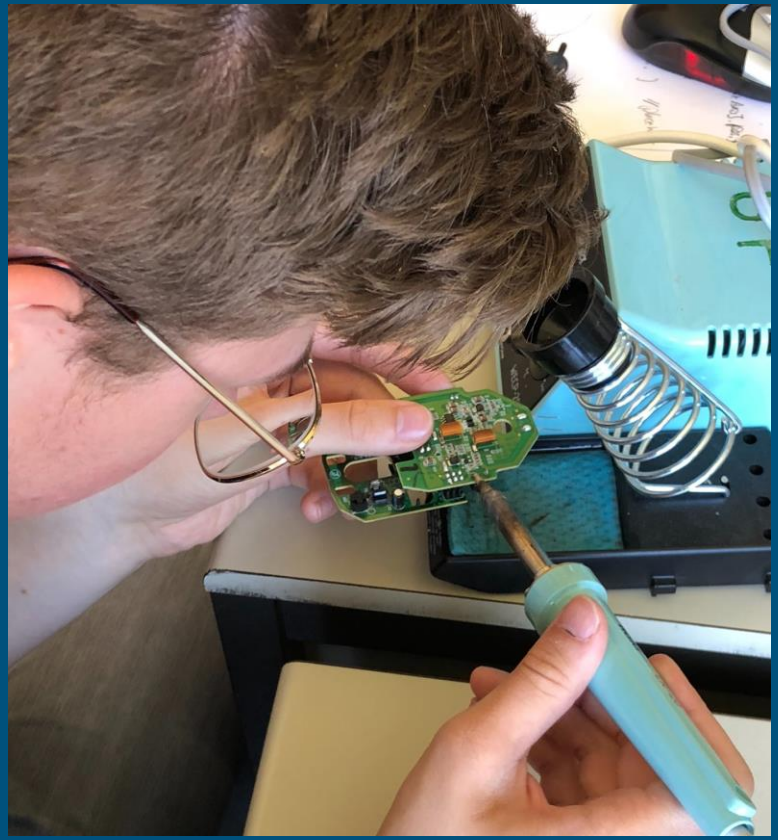


Step 2

Started writing the code (divided it in multiple parts)

Supervisor summarised the main code to the next day

Started connecting cables and motors, testing how it interfaced with the code.

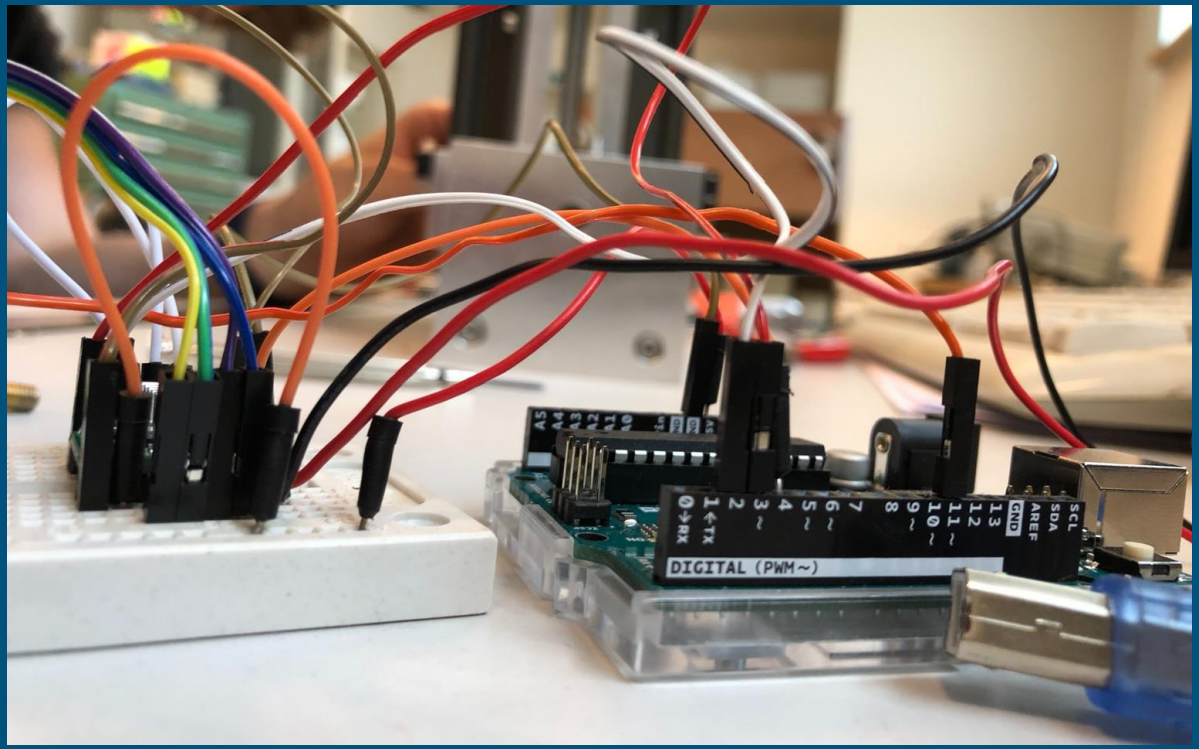


Step 3

Testing if the finished product works

Connecting water coolant and cables to the magnet and power supply

Rewriting some of the working software since it didn’t work, correcting it accordingly.



Did it work??

Actually, no

Results

Helped the VITO team with their project along the way

Developed a functional software program, that controls the 3D stage

What did we learn?

To code in Arduino

Build things and control them with Arduino

A engineers mindset

How experiments work and are developed

How you approach a bigger problem

Problem solving