ALBA MagnetLab

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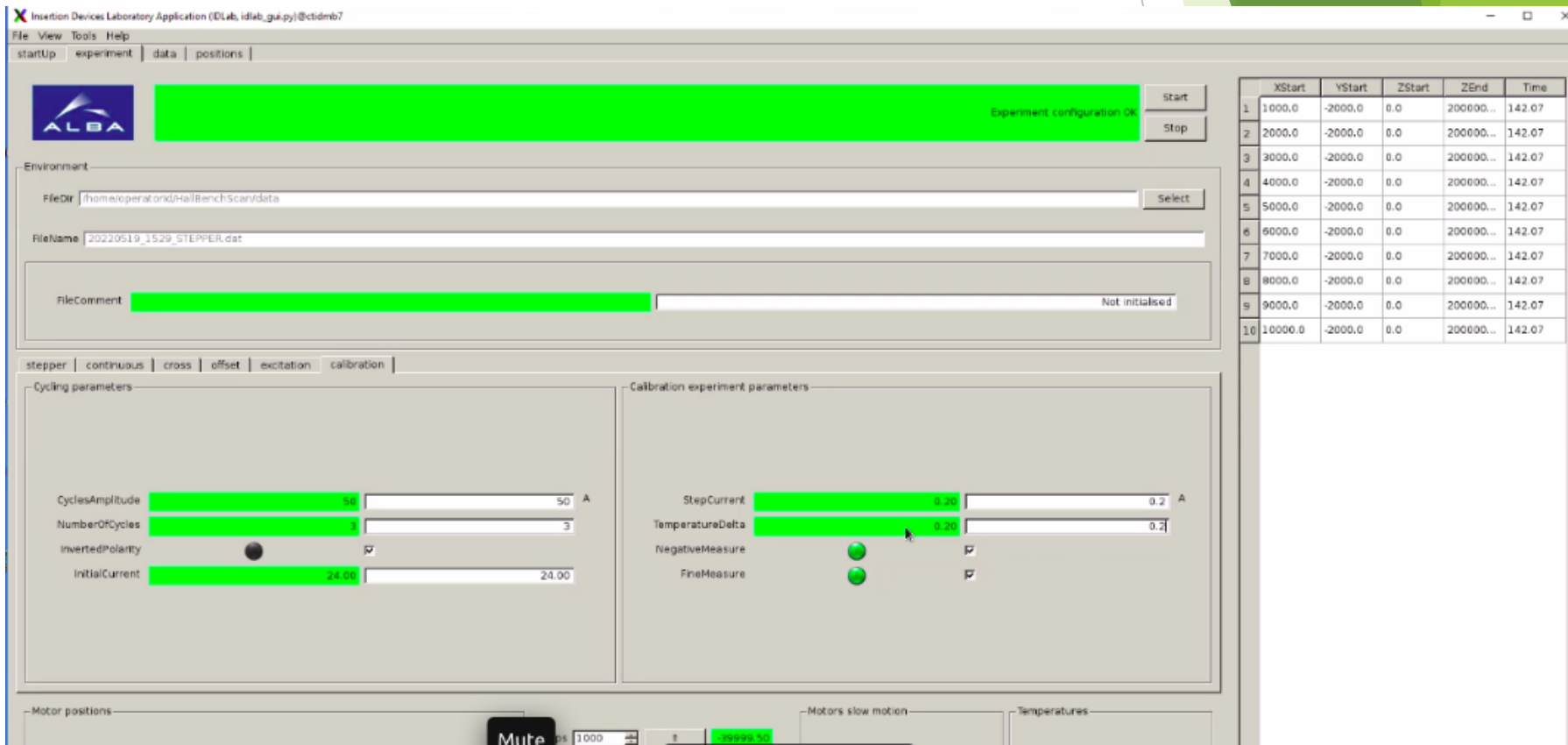
Laboratory Setup

- 3D Movable Hall Bench with probe
- Free movement
- Step scan (lines, grid)
- Continuous scan (triggers)
- Calibration

Motivation for the new system

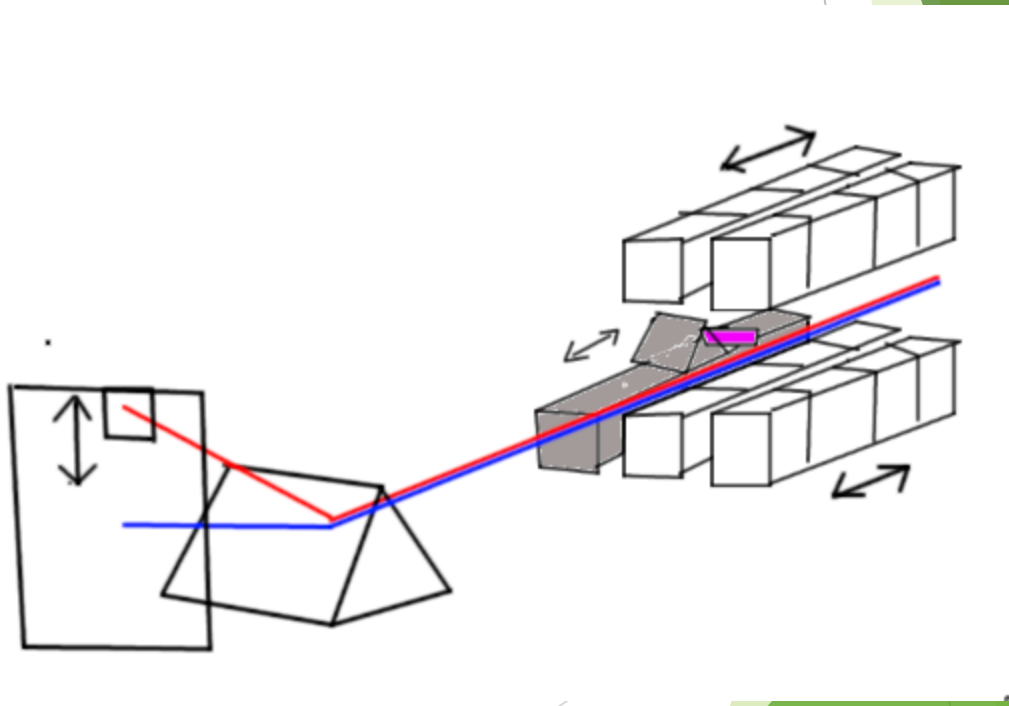
- Previous system developed by the student (~8 months of development)
- **High rate of failures (failure rate of 5 hours scans was 10-20%)**
- Hard to recover after the failure (manual reset of Devices and Sardana controllers required)
- Device servers written in Python 2.7 and C++, using old tango low-level server API
- GUI design refreshment (not top priority)



EPU model
Mini preparation project

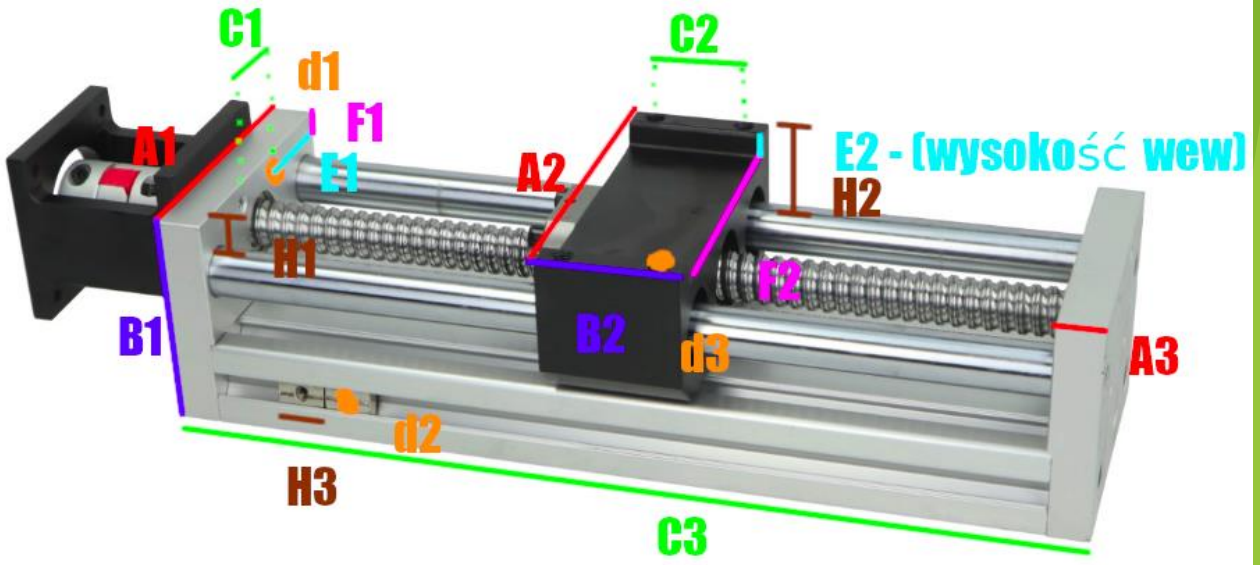
EPU Project

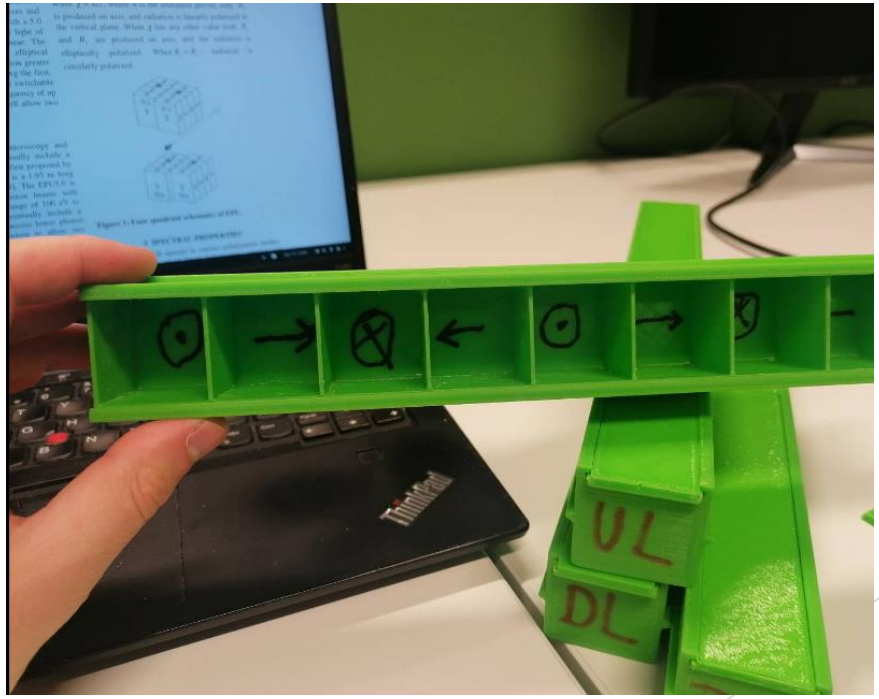
- Few weeks to begin the main project
- Promotional materials needed

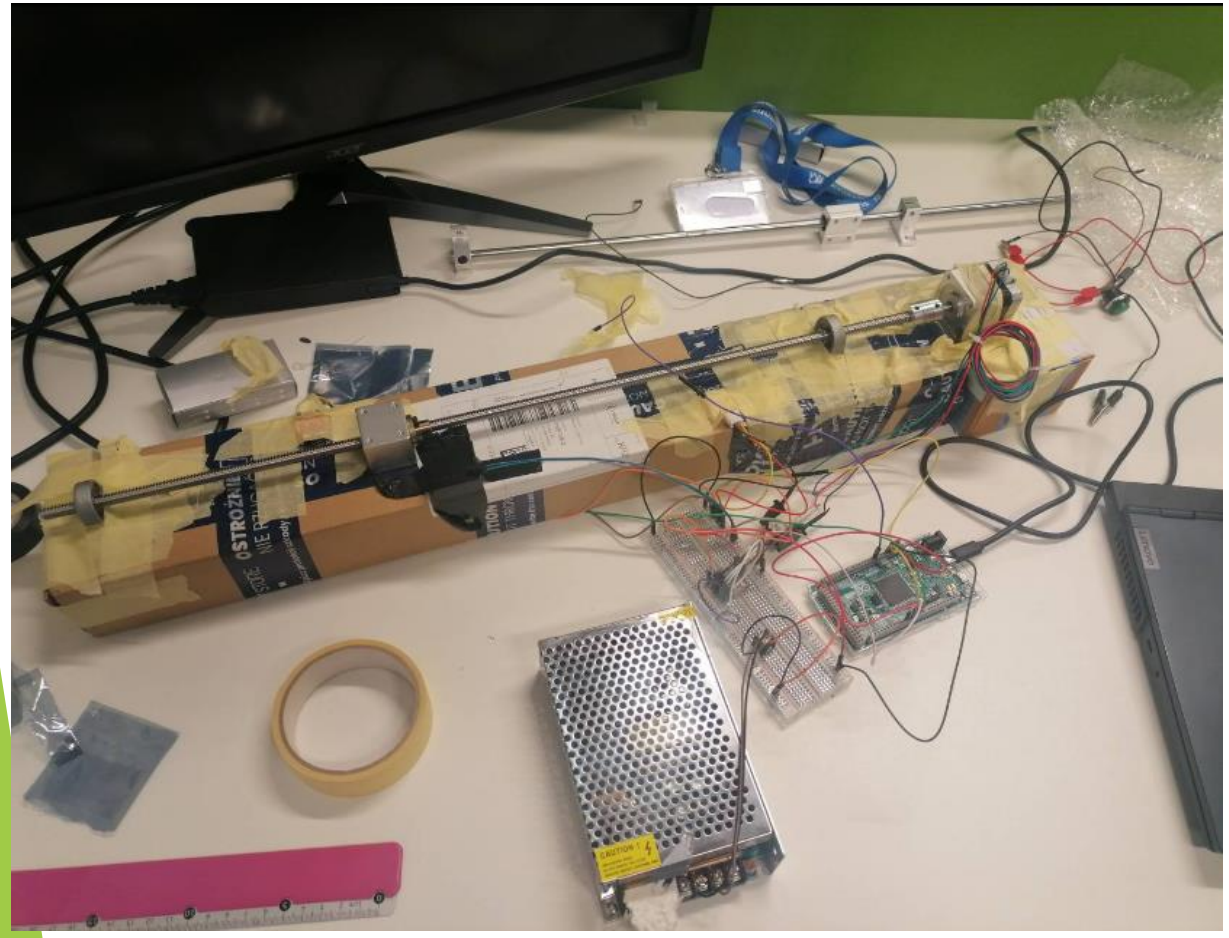


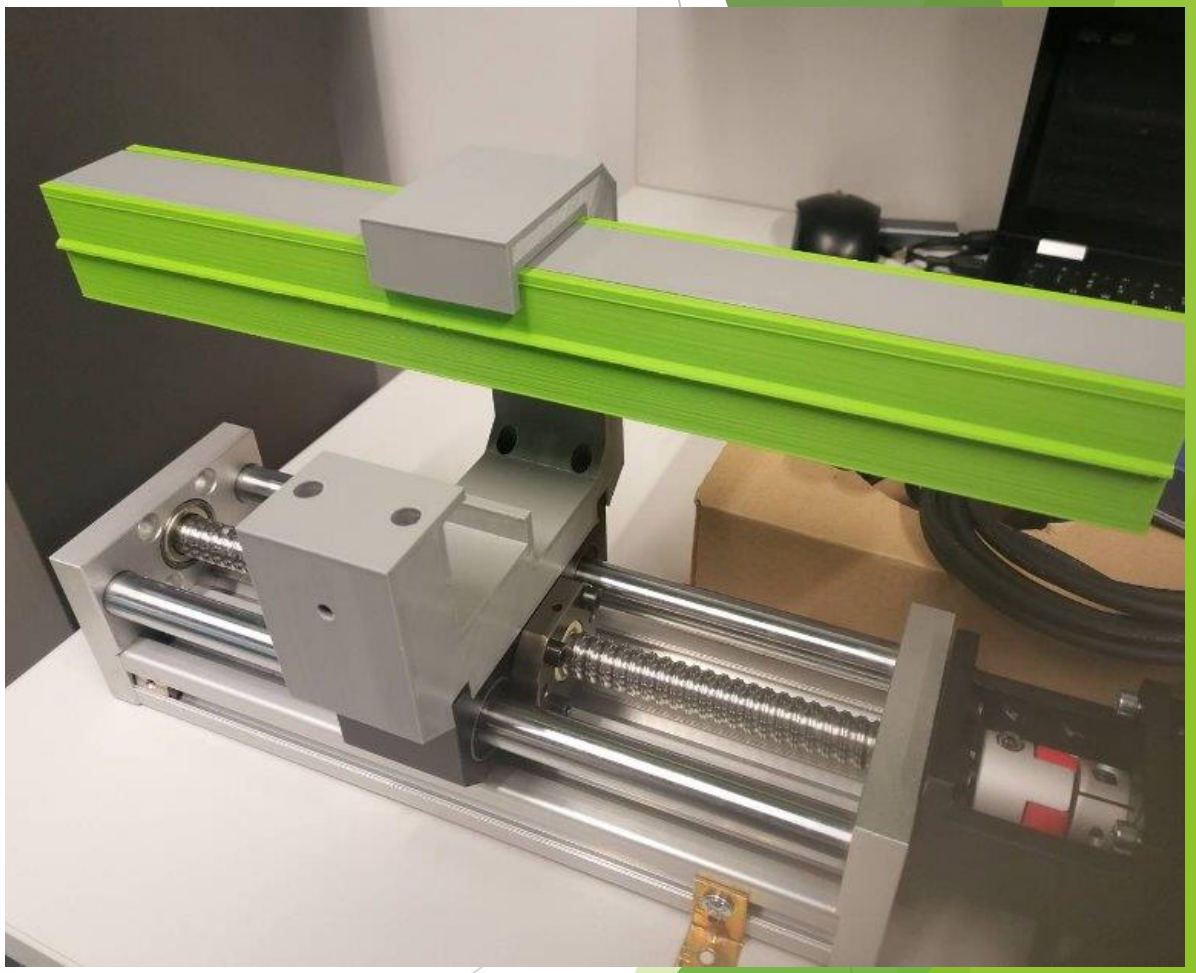
Shopping list

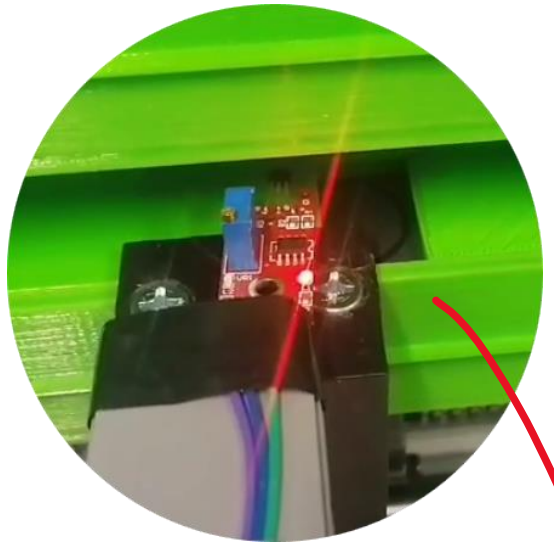
- Two stepper motors (+drivers)
- Power supply
- Arduino
- Hall probe sensor
- Ferrite Magnets... many
- 3D printed frames and holdings
- 3D printer parts for runners

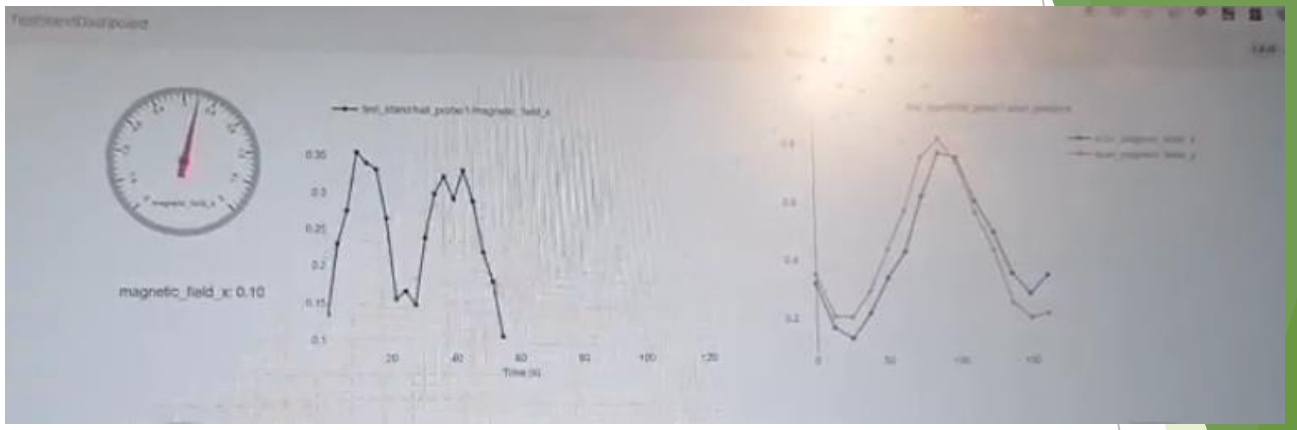








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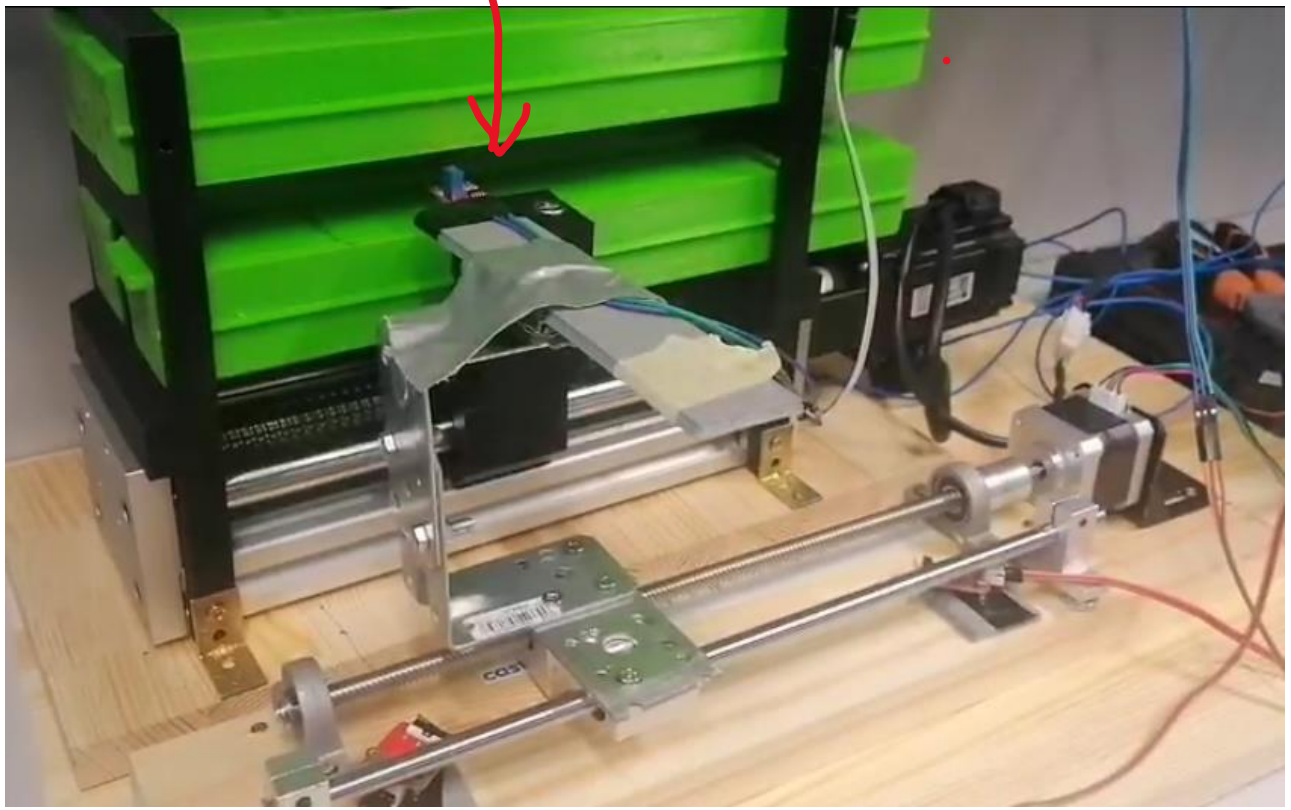

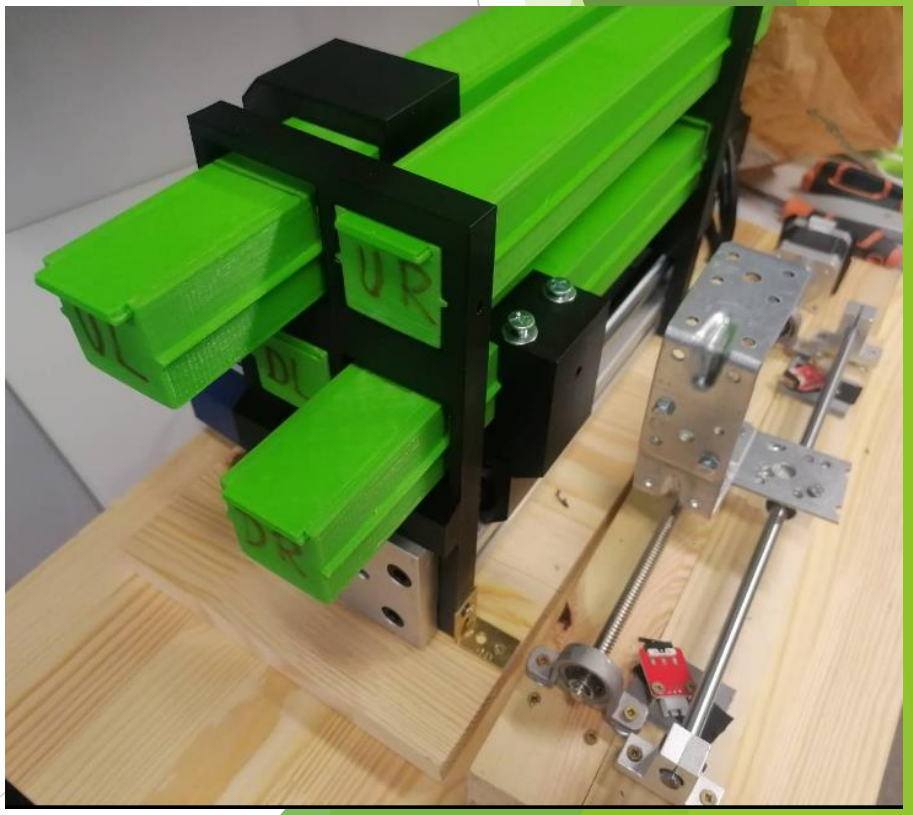
UL
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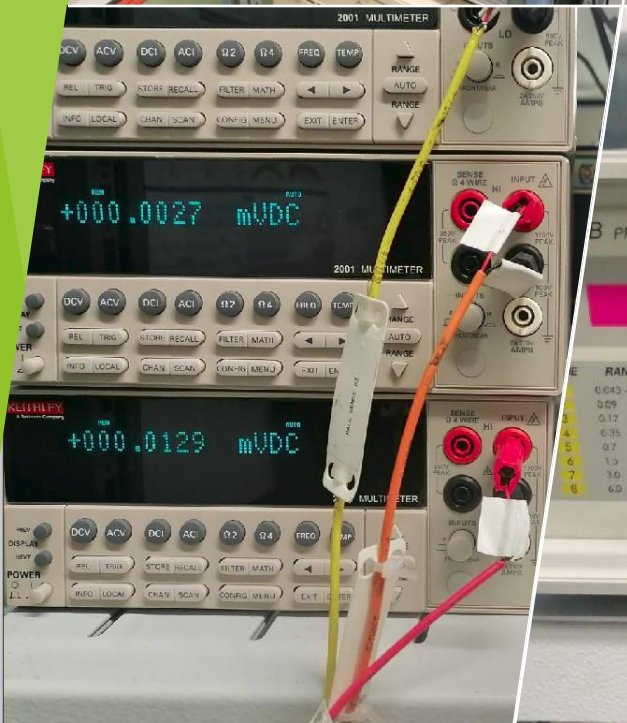
Back to ALBA Project



Equipment (Device Servers)

- 8 Device Servers to create/refactor
- PowerPMAC Motion controler
- Keithley Voltometers
- Power supplies (Lakeshore, Danfysik)
- Thermometers
- Teslameters
- Electromagnet

Requirement no. 1 - robustness

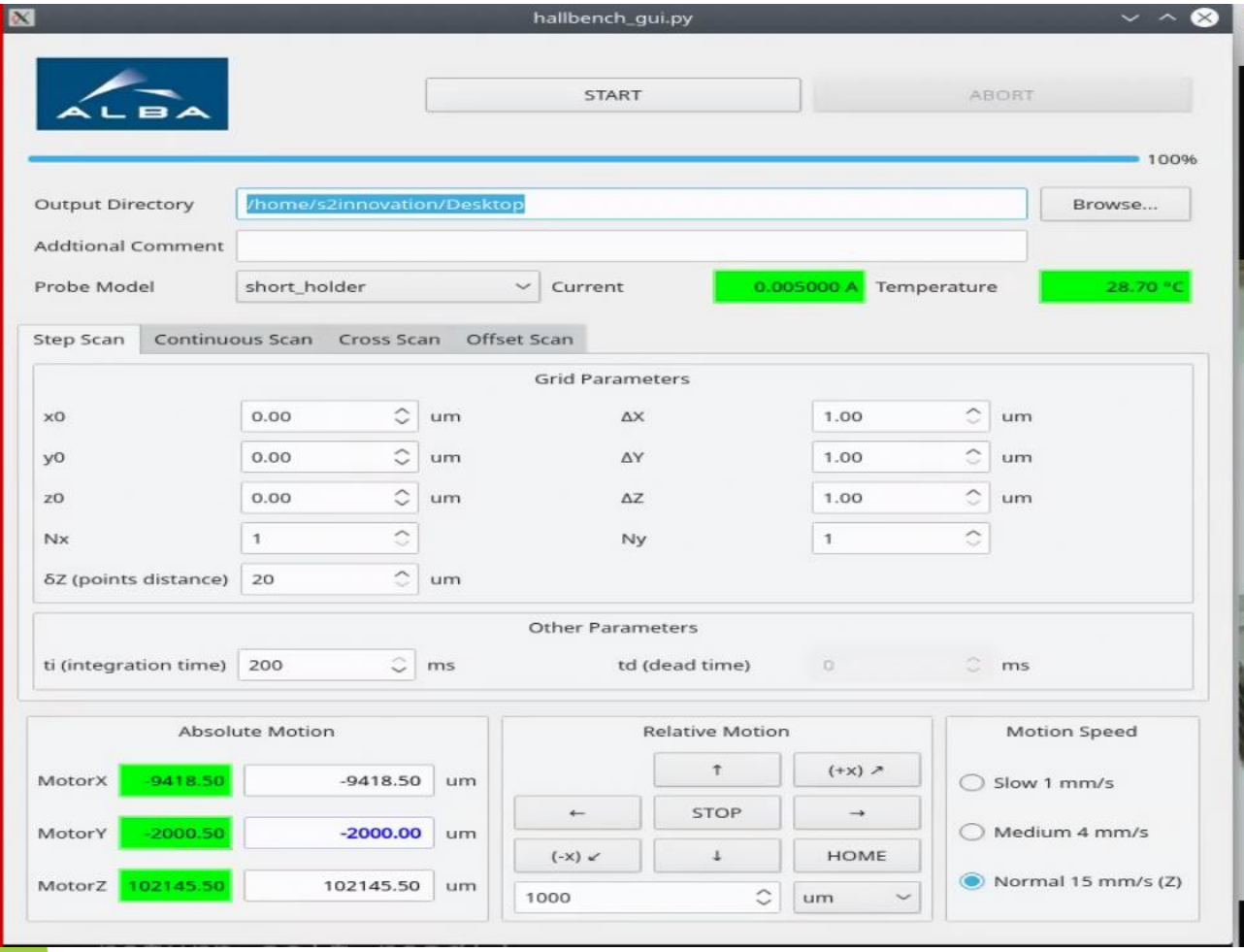
Sardana or not?

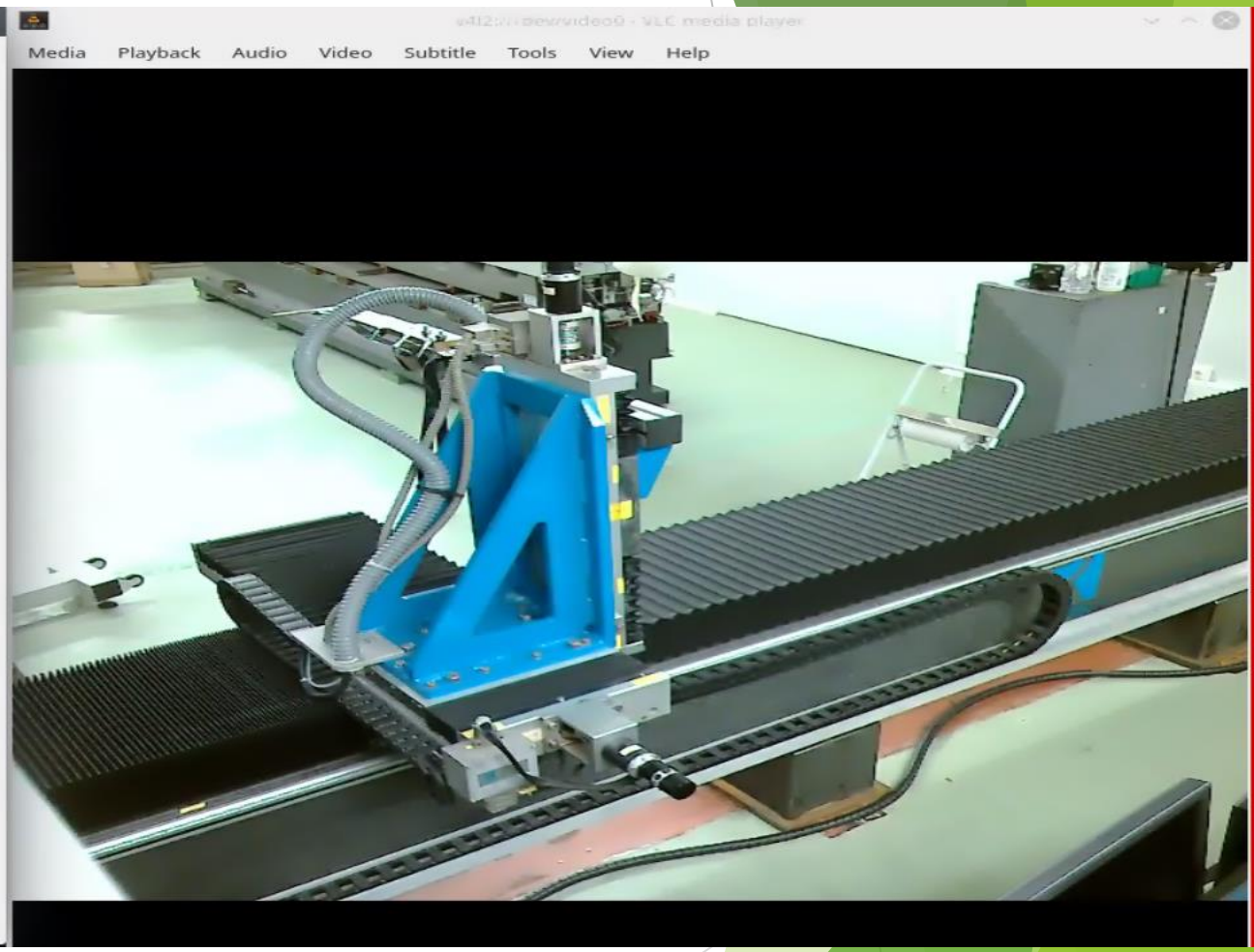
- Previous code used Sardana extensively
- Previous code used more "exotic" classes – triggers
- Previous code looked good, apparently without mistakes – I had to do something different
- It's an additional level of abstraction, complicating simple logic (move, measure, repeat) - can be implemented in pure python
- No synchronization of multiple devices required
- I had a blessing from Zbigniew Reszela
- No Sardana in ALBA – bold move

Project Workflow

1. Connection to the devices (on-site)
2. Device Servers implementation/refactoring (on-site)
3. Preparation for remote work (on-site):
   - Photo documentation of hardware and connections
   - Installation of camera in the laboratory
4. Development of GUIs (remote)
5. Acceptance testing (cooperation on-site + remote)

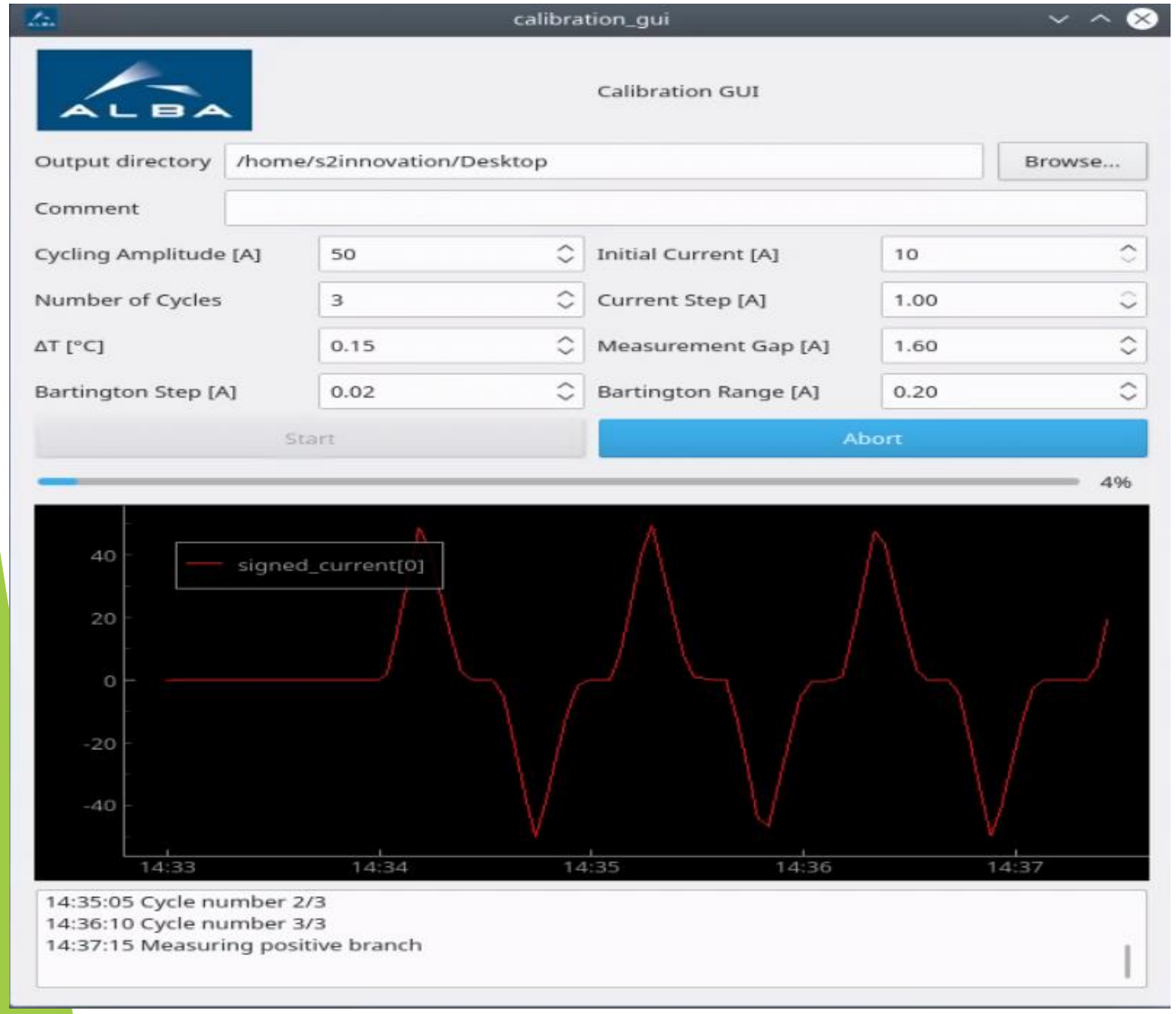
New GUI





- All required functionalities implemented
- No software-induced failures
- Immediate recovery after hardware problem (missing triggers)

Calibration GUI



- Cycling electromagnet
- Measurement of stabilized values

Thank you