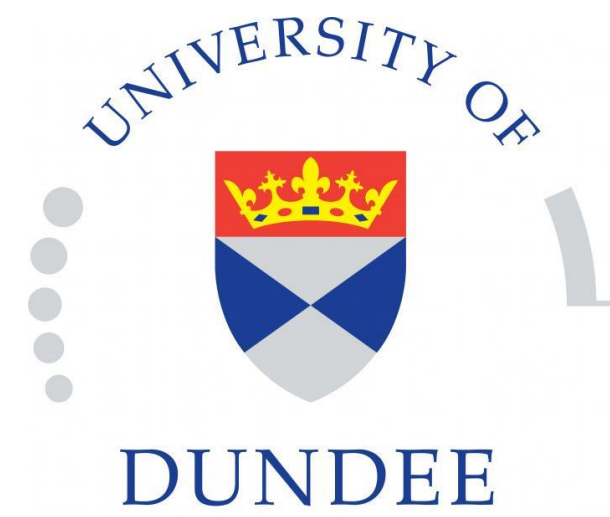


Syringe Filling System for New-born Injections



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Msc Biomedical Engineering

Background:

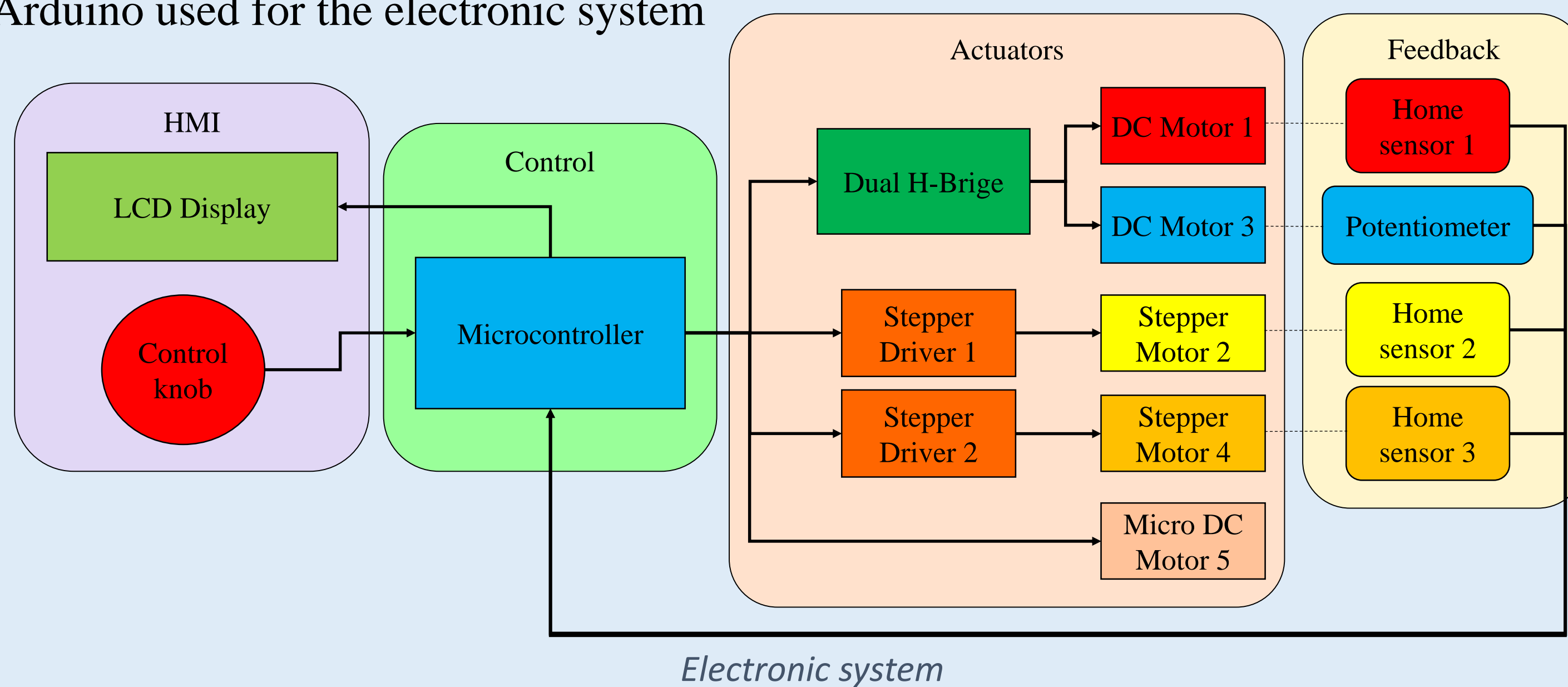
Every year, 5 000 babies are born at Ninewells hospital. According to the weight of the baby a specific amount of vitamin K needs to be administrated to each of them, to avoid Vitamin K Deficiency Bleeding (haemorrhage). [1]

Aim/Method:

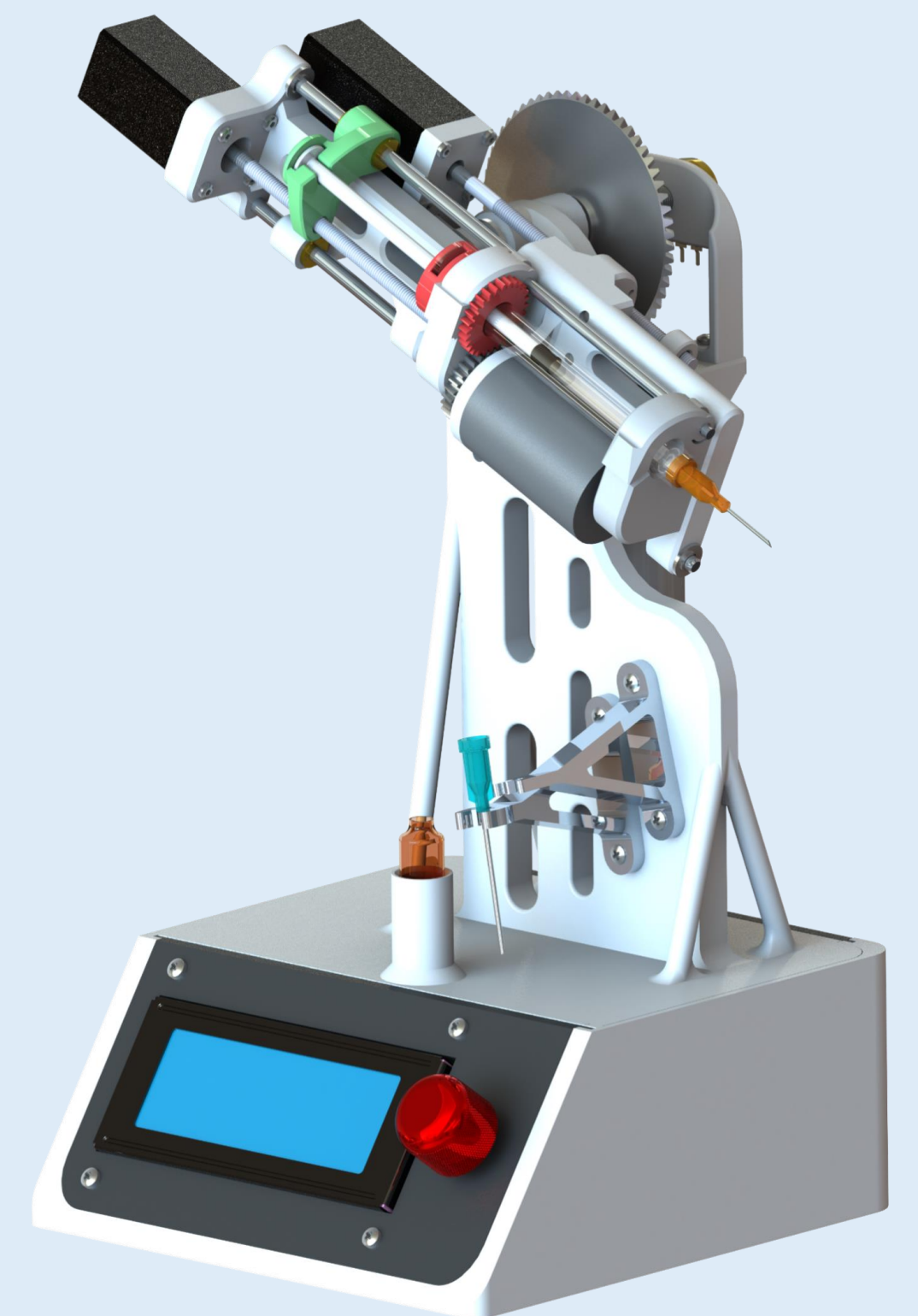
Demonstrate the feasibility of a Syringe filling system to increase the precision of drug injected and reduce the risk of human error, by studying the market for existing solutions and designing a prototype.

Design:

- Complete mechanical model designed on Solidworks
- Arduino used for the electronic system



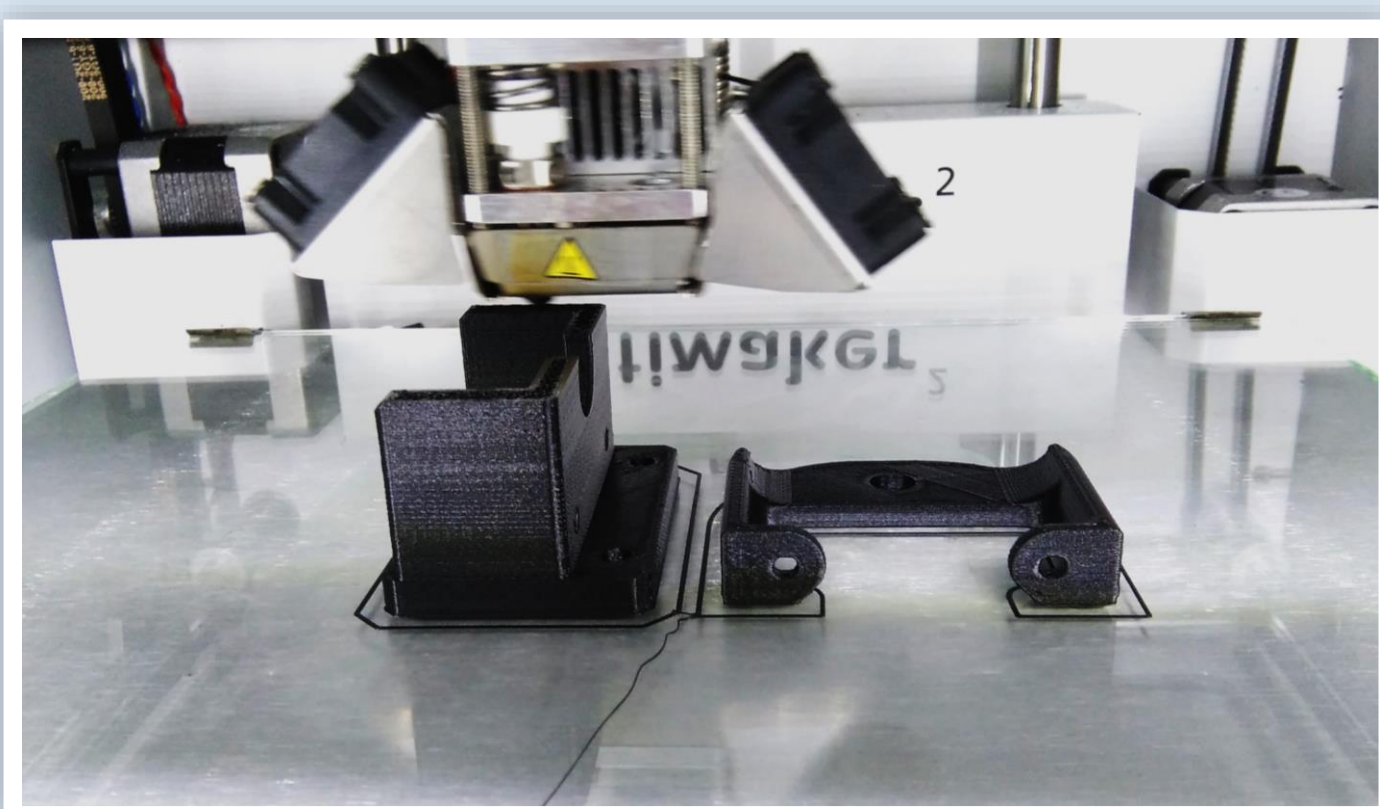
Electronic system



CAD Model

Manufacturing:

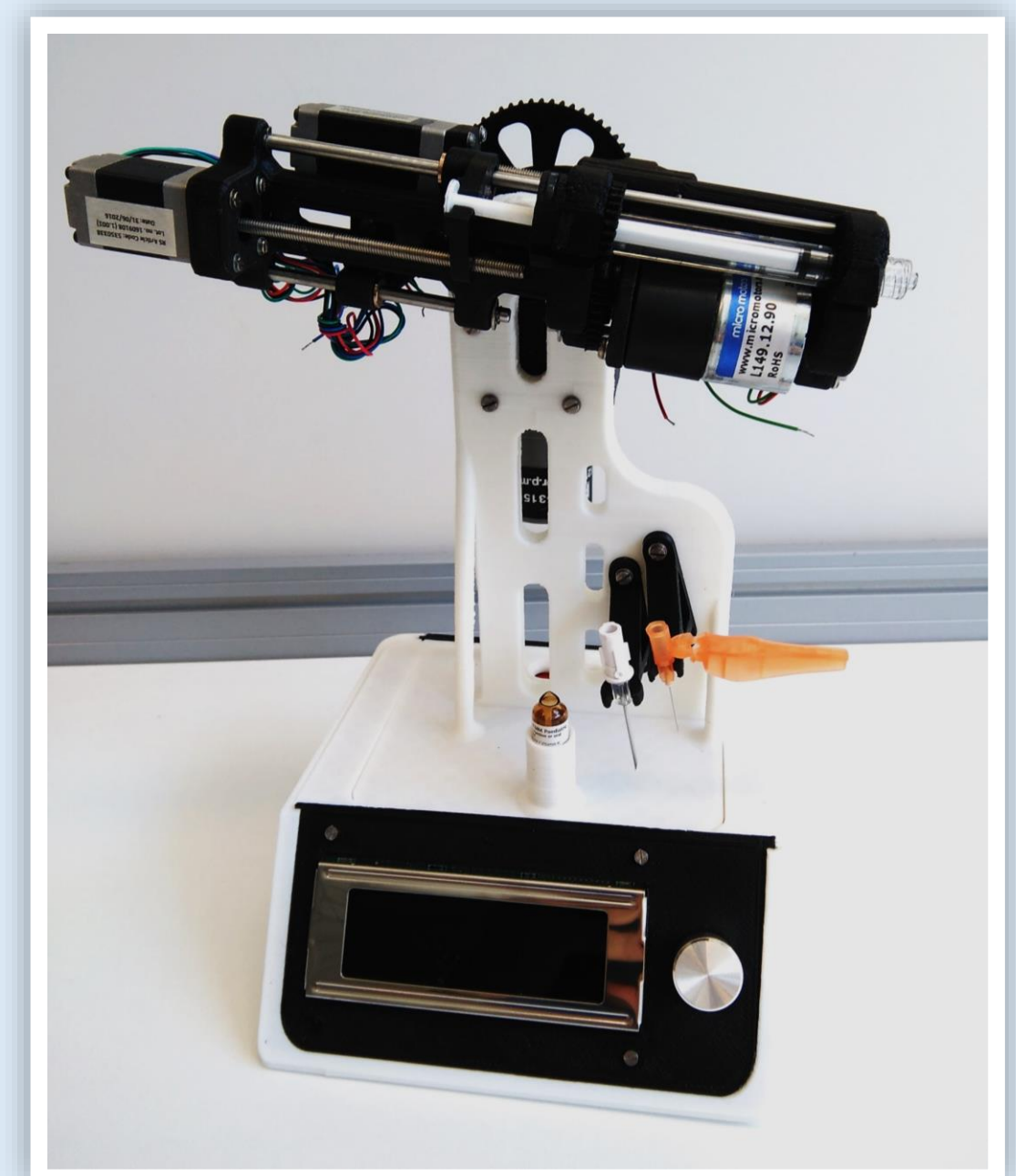
- 3D Printing
- Conventional manufacturing



3D Printing

Features:

- Preserve needles sterilization
- High precision dosage
- Filter needle and 25G needle supported
- Intuitive interface
- Light and portable
- Fast



Prototype

Further work:

- Improve the reliability of the system by adding control sensors, especially to control the dosage inside the syringe.
- Make evolve the design by considering every point of the medical device standards.
- Manufacture a prototype made of stainless steel

Conclusion:

This system is expected to make a big difference inside the neonatal ward, by taking away some pressure carried by the clinicians and at the same time ensuring an accurate syringe preparation, especially for premature baby injections where the amount is variable.