Position Sensing and Imitation
Intermediate Presentation

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Reminder: Goal Statement

- **Goal:** Mimic position and motion of a plate

- **Sensing:** 3D MEMS attitude sensor embedded in a plate
- **Communicating:** Implement industrial bus
- **Actuating:** Rotate a plate using motors

Reminder: Functional Overview

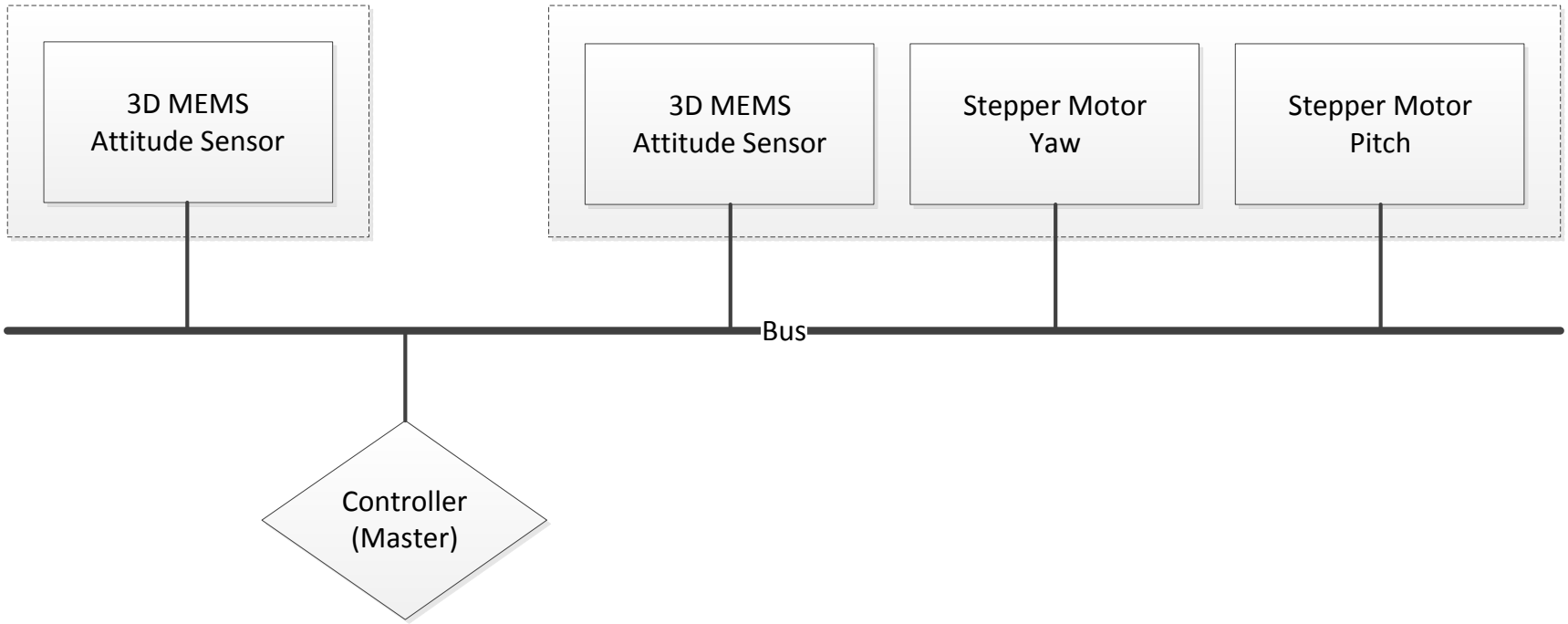

Figure : Diagram of the Functional Specification

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Reminder: Major Milestones

- **Sensing:** Read and process MEMS data
- **Actuation:** Control stepper motors
- **Mechanics:** Construct movable plate
- **Communication:** Implement industrial bus
- **Controller:** Bus master, main computational unit

Milestone: Sensing

Read and process MEMS data

Status:

- Reading data via I2C works
- Computing plate position from data works
- Additional filtering might be required

Milestone: Actuation

Control stepper motors

Status:

- Communication with stepper drivers via SPI works
- Control of stepper motors works
- Additional work on control daemon necessary

Milestone: Mechanics

Construct movable plate

Status:

- First version of plate construction printed
- Works for now
- Design on second, refined version in progress

Milestone: Communication

Implement industrial bus

Status:

- A lot of research was done
- Ethercat selected as most interesting
- CAN selected as fallback
- Work in progress

Milestone: Controller

Bus master, main computational unit

Status:

- Modular design to fit CAN and EtherCAT
- High-level controller class receives periodic sensor input events
- ... and computes angle corrections for all drives
- CAN or EtherCAT wrapped into classes to provide the events and send corrections
- Build on a BeagleBone Black

Future work

- Implement bus communication
- Finish master controller
- ... TODO

Thanks for your attention!

Questions? Ideas? Suggestions?