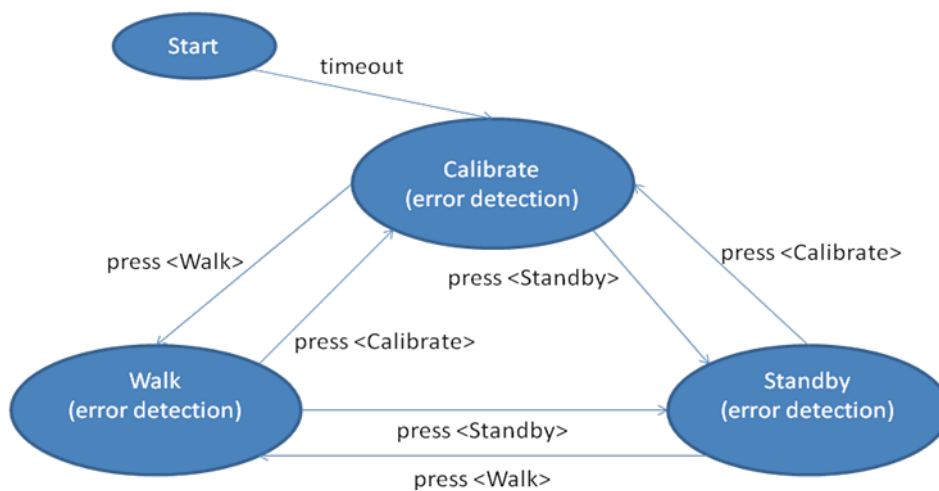


UI Finite State Machine on Main Brain

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The UI board sends and receives data through CAN to communicate with the main brain. In the main brain, there's a UI FSM to control actions on the UI board.

In the UI FSM, it detects button input from the UI board, and switches state according to changes on UI buttons. There are 6 buttons on the UI board. I currently use the first 3 buttons for: Calibrate, Walk and Standby. Below is a graph of the UI FSM.



The graph shows that switching of states is controlled by input of UI button. The first state after starting up is Calibrate state.

Each state detects error along with its default functions. If there's an error (`detect_error()` returns 1), the UI LCD shows the error code for 3 seconds, and then shows information of current mode for another 3 seconds, alternatively. If there's no error detected, the UI LCD always shows information of current mode.

For different states, the main brain sends different actions to the UI board, and UI LEDs and UI LCD display specified information. A form below shows what UI LEDs and UI LCD do in every state.

State	UI Component	Action
Calibrate	LED	LED #1 turns on to PURPLE

	LCD	Display "M: C" on the 1 st quad of LCD
Walk	LED	LED #2 turns on to GREEN
	LCD	Display <i>Battery Voltage</i> on the 1 st quad of LCD Display <i>Hip State</i> on the 2 nd quad of LCD Display <i>Inner Foot State</i> on the 3 rd quad of LCD Display <i>Outer Foot State</i> on the 4 th quad of LCD
Standby	LED	LED #4 turns on to YELLOW
	LCD	Display "M: S" on the 1 st quad of LCD
*error detected	LED	LED #4 turns on to RED
	LCD	Display the error code on all the 4 quads of LCD