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Modular Capacitive Touchpads Checklist

Baseline Goals

1. At least one working touch sensor block with 16 capacitive sensors.
2. Control and reading of block sensors by the FPGA.
    (a) I2C commands to switch sense line connections.
    (b) FPGA frequency/capacitance sensing.
3. FPGA outputs image of which sensors are pressed to the display.
4. Use of the touchpad sensors to control other FPGA outputs.

Expected Goals

1. Multiple working touch sensor blocks that can be connected together
2. FPGA scans I2C address space to detect connected sensors at startup.
3. FPGA automatically determines the layout of touchpad blocks at startup, and displays it on screen.
4. Sensors are correctly mapped to an X,Y coordinate designation for use for IO functions (ie, keyboard, tracking, anything arbitrary you might want to do with it)

Stretch Goals

1. Hot swappable sensor blocks
    (a) FPGA continually scans I2C address space during sensor I2C bus dead time (during sensor reads)
    (b) If a change is detected, wait for the current sensor scan to complete, then halt sensor polling and remap sensor layout.
    (c) resume normal operation and update display to new layout without user intervention, don't crash and burn it the new layout conflicts with IO definitions.
2. Keyboard emulation or other control of a computer by the touchpads.
3. Fabricate PCBs for the touchpad block circuit
4. Possible other entertaining applications