Virtual Softball

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User Experience

VISUAL CUES

IMU DATA → VGA DATA

- User responds to visual cues
- Swings bat with motion sensors
  - timing and bat angle

- Ball approaching
- Visual feedback based on swing

Motivation – Use Cases

- Competitive Athlete

- Just for Fun

- More practice opportunities
  - Can practice alone
  - Requires less space and equipment
- Can be used when playing outside is not an option
- Can gain unique immediate feedback on swing mechanics

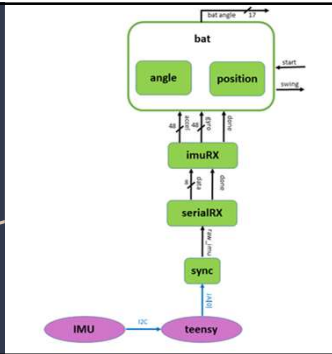## Motivation – Use Cases

- Competitive Athlete

- Just for Fun

- Opportunity to play a unique sport
- Use real equipment
- Feedback on how to swing a bat

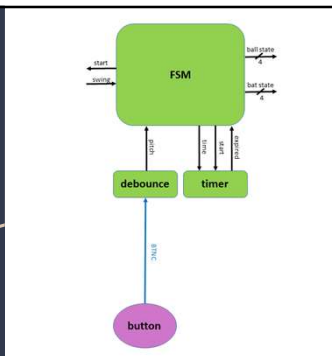
Bat Angle

Block Diagram

Physical

- Real softball bat
- IMU determines
  - Timing of swing
  - Angle of bat
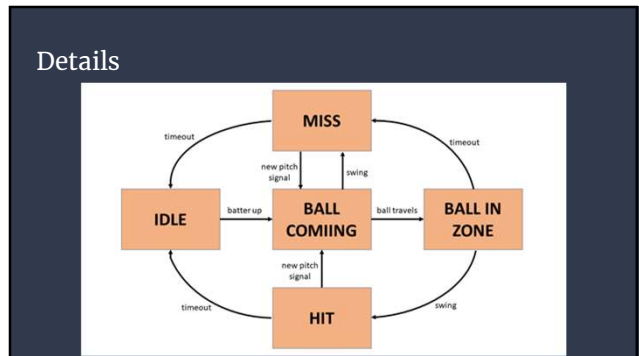- Interface serially with Teensy microcontroller
- *Stretch*: wireless comms

Current State

Teensy transmits IMU data at 400Hz serially at 115200 baud

FPGA deserializes IMU data and displays X,Y,Z accelerations

FSM

- Game sequence
- Timing
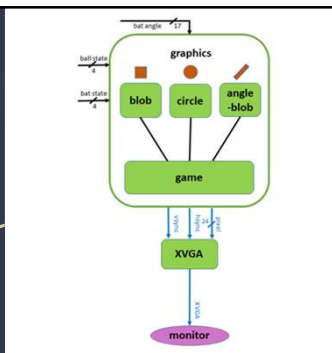- Control commands
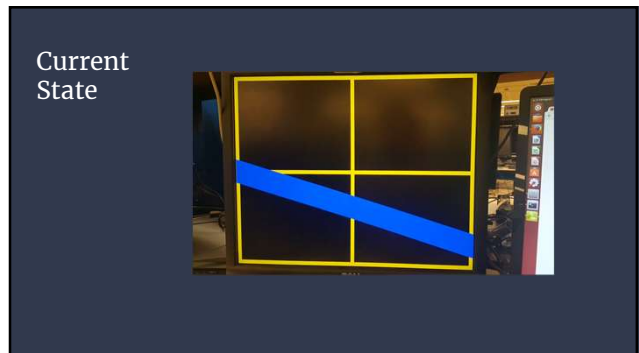- *Stretch*: fielder player

Details

Graphics

- Port pong-game to Nexys4
- Objects represented by a module
  - Ball
  - Bat
  - Strike Zone
- Dynamically change based on control commands
- *Stretch*: LEDs!

Current State

Timeline

- Week of 10/30 -   IMU interfacing and ball/bat graphics
- Week of 11/6 -   bat physics and universal timing
- Week of 11/13 -   gameplay
- Week of 11/20 -   user testing
- Week of 11/27 -   buffer time / stretch goals
- Week of 12/4 -   finishing touches
- Week of 12/11 -   submission!!!

Any questions about our *pitch*?