# Sports Timing Systems Research

Systems challenges:

* Management of hardware
* Wires over long distances
* Timing gates
  + May have inaccurate recording of time due to human arms and legs being in front of the center mass breaking the beam early at the start and finish line.
* Delay on signal (RFID)
  + interference with other devices that may be on the same frequency
  + limitation of bandwidth and RFID tags
* Unified start signals (referee vs timer)
* How many signals can it process?
* power management of the sensors
* (Freelap Timing) Tracks or field space are partially used up for the timing system and devices.
* Batteries etc. (notification on low battery)
  + Some used systems today are outdated with only household batteries
* Materials (weather conditions)
  + mats that can withstand from the rain, being run over by runners, bicyclist
* Ease of set up and not that time consuming.

Challenges to consider:

* Sophisticated GUI
* Ease of use
  + Apps in smartphones, programs or system’s GUI
* Software vs. mechanical switches.
* Timing system compatible to connect and communicate to other testing devices (beam, mat etc).

Common Attributes:

* Accurate and consistent
* Specifications for certain timing standards
* Sensor validity
* Print out (format of time)

# Three Use Cases:

USE CASE: IND RUN



USE CASE: Retrieving Data



USE CASE: System Operations



System startup - sys admin - startup and shut down - conn, disc

Export - race sdmin - reset, newrun, endrun

IND run - tog, num, clr, dnf, trig, start, finish

# Stories:

Release 1: Simulator start, Simulator File Input, Simulator Console Input, Start, Stop, Reset, TIME(set time), TOG, CONN, DISC, NEWRUN, ENDRUN, START, FINISH, TRIG<NUM>, SWAP

Release 2: EVENT<Type>, multiple channels, export to file, display on console

Release 3: Group races (single start, series of single finishes), various displays, GUI

Release 4: Parallel Group Races (Swimming), send results to web server

# Division of Labor:

Timing System:

Fue, Isaac, Phil

Simulator:

Andrew, Riley

# Team Contributions

Riley – contribute to research on other systems, use cases, documentation of research, organizing stories

Phil- Contribute to generating question, created use case diagrams.

Fue – Contribute to research and documenting on various timing systems and the challenges the systems have.