ABC Drone: Tactical Sports Footage

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CS 4624 - Multimedia, Hypertext, and Information Access Capstone
Outline

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➔ Future Plans
➔ Lessons Learned
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Project Overview

- Software solution to operate tethered sports drone
- Drone will be capturing tactical footage for coaches
  - Secondary feature of being able to live-stream
- Target audience:
  - Youth
  - College Club
  - Semi-Pro
- Pivot from Live Streaming/Tracking to Post Processing and game footage editing.
Accomplishments

Feb
- Minimum Viable Tracking (70% accuracy)
- Field Tracking-Bounds
- Digitally PTZ Pre-Recorded

Mar
- Improved Tracking (85%+)
- Log all video framing
- Proof of Concept GUI
- Neural Network Creation and Training
- AWS

Apr
- GUI Rework
- Player Stats
- Player Highlights
- Manual tracking (Plan B)
- Output Video Creation

May
- Full system Proof of Concept*
- Prototype System*
- Demonstration*

*Future Plans
Minimum Viable Tracking

Contours

Threshold
Field Bounds

Please see supporting presentation files to view the Field Boundary demonstration.
Digital PTZ

Please see supporting presentation files to view the Digital PTZ demonstration.
Machine Learning Model

- Highly accurate, very slow
- Could create PTZ video in background
  - Not practical at this stage
Plan B - Manual Tracking

- Alternative to our automated tracking system.
- Uses a video game controller to pan, tilt, zoom, FF, and cut a digital feed.
Live

PTZ EDL Creation

Cut Video (excludes stoppages in play)
Key Plays File

Player Stats/Highlights

OR

EDL Processing

OR

AWS
Full Scale Demo

Please see supporting presentation files to view the Full Scale demonstration.
What Did Not Work?

- AWS Integration (for now)
- Live Tracking with ML Model
- Persistence Tracking
- Auto-Adjusting Field Boundary
Future Plans

- Streamline Post Process
- Get ML Model to create EDL File
- Document Code
- Prettify GUI
- Create Companion App for GUI
Lessons Learned

- Document as you go
- Video manipulation = math
- Use Objects as much as possible in large projects
- Be willing to adapt at a moment’s notice
Acknowledgements

- **Client - Charles Kerr.**
  - Independent Consultant based in Raleigh, NC.
  - Coach, and Founder of JinxCam.

- Dr. Fox and all of the CS 4624 support staff.

- Qualified for $2500 AVUSI Drone Grant.

- **Important Libraries:**
  - OpenCV Library (https://opencv.org)
  - Tkinter Library (https://docs.python.org/3/library/tkinter.html)