sdmay19-08: IC Chip: Automated Clay Target Scoring System
Week 4 Report
10/6/2018 - 10/12/2018
Client: Dr. Henry Duwe
Faculty Advisor: Dr. Henry Duwe

Team Members:

Eva Kuntz – Software Architect Lead; Report and Communication Manager
Cole Huinker – Software Architect, Data Collection manager, Computer Vision
Steven Sleder – OpenCV and Machine Learning Lead; Data Analytics Lead
Michael Ruden – Hardware Architect Lead; Prototype Manager
Philip Hand – Device Connectivity Lead
Keith Snider – Software Architect; Webmaster

Weekly Summary:

This week our team spent a lot of time working with the data we collected in September. Steven spent a huge portion of the week labeling data and drawing bounding boxes around clay targets and shotgun wads. Eva, Cole, and Keith spent a majority of their time working on the mobile application architecture and selecting a development framework. Mike worked on narrowing down hardware to use for the prototype.

Past Week Accomplishments:

- Continued to label data
  - Collected and labelled minimum amount of data to perform testing on object detection and tracking.

  - Steven developed a program to rip individual frames from a video, making the data labeling on each frame more efficient.

- Data collection specifications
  - Created document detailing how to collect data, including proper camera placement, best camera angles, and when to start/stop recording.
- Mobile application
  - Completed and revised mobile application use cases.
  - Selected Xamarin framework for mobile application development.
  - Started discussing mobile application architecture and layout.
  - Set goal of having mobile application completed by end-of-semester and use fake data set to test with.

- Hardware
    - Started development on power supply for device using a switch mode power supply design.
    - Created a program that would demonstrate how camera would look on the field at a given position, field of view, and focus. Example included:
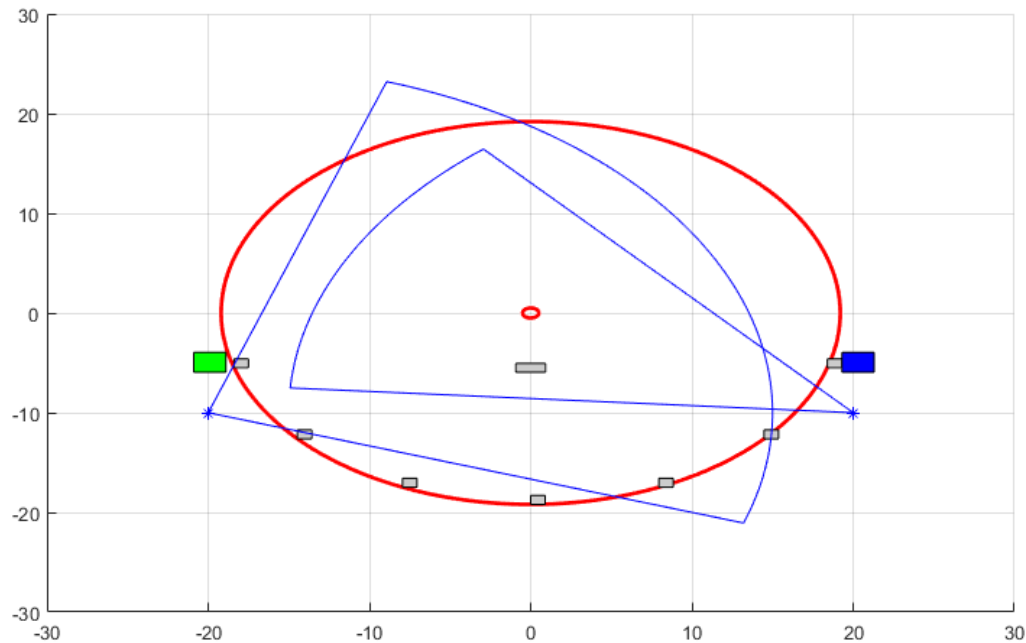
Pending Issues:
- Training data may not be have enough detail, may need to record more from closer positions.
- Still need to narrow down hardware team will use for prototype.
- Set up time with ISU Trap Club to collect more data for model training.

Individual Contributions:

Team Member	Contribution	Weekly Hours	Total Hours
Eva Kuntz	Refined use cases and domain diagram for mobile application, started creating screen mockups for mobile application and familiarizing self with Xamarin.	8	32
Cole Huinker	Worked on Data Collection specifications document. Familiarized myself with Xamarin for the mobile app.	6	30
Steven Sleder	Labelled ~1100 of~ 22000 individual images for training data, wrote a program to rip individual frames from videos and follow standardized	7	30

	naming conventions		
Michael Ruden	Created a program that would plot out the field for a given camera properties. Started development on power supplies for device.	7	27
Philip Hand	Continued labeling data	6	21
Keith Snider	Selected Xamarin as mobile application development framework and started experimenting with socket programming; Created main page and placeholders for information. Helped application requirements and started working on application architecture.	7	24

Plans for the Upcoming Week:

- Eva Kuntz – Continue to focus on mobile application
  - Revise any mobile application requirements.
  - Work with Cole and Keith to develop and refine mobile application architecture.
  - Get approval on architecture design from client.
  - Begin development work on mobile application.
  - Continue working on screen mockups.
- Cole Huinker – Focus on data collection and mobile development
  - Revise the data collection specifications to include things such as field of view and focal length.
  - Get in touch with the ISU skeet club through Dr. Duwe, schedule a time for a safety lecture, and schedule a time to collect more data.
  - Figure out how we are going to protect the camera when collecting data.
  - Work with sockets using the Xamarin framework.
  - Become more familiar with Steven's work.
- Steven Sleder – Image the Jetson TX2 and attempt to run Darknet on training data.
- Michael Ruden – Continue development on the program showing camera properties.
- Philip Hand – Will continue to label the training data
- Keith Snider – With template created, logic files need to be created and more extensive socket work needs to be tested. Implementing architecture template.