

sdmay19-08: IC Chip: Automated Clay Target Scoring System

Week 7 Report

10/28/2018 - 11/3/2018

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 Analysis, 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 past week was focused on improving the accuracy of the machine learning model using a smaller data set size, in addition to calculating which range camera position would capture the best field of view for data collection.

### Past Week Accomplishments:

- Mobile Application
  - Continued work on mobile application screen flow diagrams.
  - Completed research on affordable tablets for mobile application.
- Data Labeling and Collection
  - Met with people out in the field at Izaak Walton Rec. facility in Ames.
  - Discussed positions that would be best for collecting video data.
- YOLOv3 Model
  - Improved accuracy with batch size reduction to 64
  - Reduced model size to 608x608 to reduce memory constraints

### Pending Issues:

- Need to decide on hardware components based on computational needs.

### Individual Contributions:

Team Member	Contribution	Weekly Hours	Total Hours
Eva Kuntz	Data labeling; Compiled ideas for mobile application screen flow diagrams; researched affordable tablets for mobile application	8	56
Cole Huinker	Data collection, data labeling, networking research for Xamarin on Android	8	53

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<b>Steven Sleder</b>	<b>Tweaked hyper-parameters for YOLOv3 to improve performance and decrease memory usage</b>	<b>8</b>	<b>56</b>
<b>Michael Ruden</b>	<b>Worked on Simulation model. Attend safety meeting for data collection</b>	<b>7</b>	<b>41</b>
<b>Philip Hand</b>	<b>Python, Frameripper, and data labeling</b>	<b>8</b>	<b>39</b>
<b>Keith Snider</b>	<b>Worked on safety screen for application</b>	<b>8</b>	<b>46</b>

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### Plans for the Upcoming Week:

- Eva Kuntz – Mobile application focus.
    - Plans for upcoming design document version.
    - Help with labeling data.
    - Finalize decision on mobile tablet for mobile application testing.
    - Help Keith with designing mock data transmission.
  - Cole Huinker – focus on data collection.
    - We are planning on going out into the field and collecting data.
    - Have a finalized plan read to go.
    - Help Steven label data
    - Find the best networking solution to send data from the ground station to the mobile application.
  - Steven Sleder – Integrate YOLOv3 with another application by examining it's hooks
  - Michael Ruden – Help with data labeling.
  - Philip Hand – Break Videos apart for data labeling
  - Keith Snider – Starting designing mock data transmission
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