

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

Week 3 Report

9/22/2018 - 10/5/2018

Client: Dr. Henry Duwe

Faculty Advisor: Dr. Henry Duwe

Team Members:

Eva Kuntz – Software Architect (Design) 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:

The focus of this past week was on labeling data. Our team members spent the majority of their time splitting up the videos from the afternoon we spent collecting data and labeling the videos as “dead target” or “lost target.” Our team also created a preliminary ‘house’ for the camera and hardware. The team also acquired a discount on an Nvidia Jetson TX2 development board and TX2 card.

Past Week Accomplishments:

- Data Editing and Labeling
 - Huge task; very tedious work
 - Determined video editing software was compressing videos and creating lossiness.
 - Researched other video editing and animation software our team could potentially use.
 - Created new data collection plan.
 - This will be a detailed plan on how video data will be collected out in the field and how it should be edited and labeled.
 - Contacted ISU Trap & Skeet club to see if they would be willing to let us videotape their practices for more data collection.
 - Clarified mobile application requirements with client.
 - Researched android frameworks.
 - PhoneGap
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Pending Issues:

- Unknown specifications for hardware (microprocessor) needed for processing video in real time.
 - Determine an affordable camera and camera placement
 - Sheer size of data-labeling task
 - Current tool used to edit videos, Blender, compresses the final video (introducing data lossiness). This causes problems when the target is too small and the lossiness that comes from
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video compress makes the target blend in more with the background in which image information is less.

Individual Contributions:

Team Member	Contribution	Weekly Hours	Total Hours
Eva Kuntz	Edited and labeled video dataset. Researched fisheye camera. Experimented with Maya, an animation tool, to determine if this is a higher quality video editing software. Started on Use Cases/Domain Diagram for mobile application.	8	24
Cole Huinker	Edited and labeled some of the video dataset. Created and started an experimental Android app in Android studio focusing on sockets. Helped start requirements/design documentation for Android app.	9	24
Steven Sleder	Edited and labeled video dataset. Found a tool for Python bounding box labeling. Found out-of-the box implementation of YOLOv2. Acquired Nvidia Jetson discount.	9	23
Michael Ruden	Created a preliminary house in SolidWorks for protecting camera and hardware. Researched into PCB programs available for use.	6	20
Philip Hand	Edited and Labeled Clay target shooting videos. Researched and looked into Yolo object detection.	8	15
Keith Snider	Researched android application architecture and frameworks	4	10

Plans for the Upcoming Week:

- Eva Kuntz – Focus on mobile application
 - Focus on design of application; detailed use case descriptions and use case diagram; domain diagram.
 - Confirm use cases with Dr. Duwe.
 - Work with Cole Huinker to understand socket programming design and needs.
 - Work with Keith Snider to model software application and start implementing code base on Android Studio.
 - Create test data for mobile application testing.
- Cole Huinker – Video data labeling and work on the android app.
 - Go over Java sockets with those mostly involve with the app.
 - Have data collection plan finished and ready to present to the client.
- Steven Sleder – Continue labeling, find labeling resources

- Determine processing power hardware needs in order to successfully process and classify videos.
 - Michael Ruden – Label training videos.
 - Philip Hand – Continue editing and labeling center videos.
 - Keith Snider – Create android application code base.
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Summary of Weekly Advisor Meeting: (if applicable)

Brought up the possibility of moving camera from being on tripods to be mountable on the high & low houses. Also brought up the option of using a 360° camera placed in the middle of the field.