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

Week 2 Report
9/11/2018 - 9/21/2018
Client: Dr. Henry Duwe
Faculty Advisor: Dr. Henry Duwe

Team Members and Roles:

Eva Kuntz – Software Architect (Design) Lead; Report and Communication Manager
Cole Huinker – Software Architect; OpenCV Lead
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:

During this time period, our team successfully collected two hours' worth of shooting range data at Boone County Sportsman Club with Dr. Henry Duwe. Steven experimented with a computer vision program to track movement, while Cole and Mike discussed hardware requirements and the computational power needed to process streaming videos. Eva and Keith started gathering requirements for the mobile application, in addition to designing the architecture of the application. Philip started labeling data.

Past Week Accomplishments:

Below is a list of what our team has accomplished during this reporting period.

- Spent afternoon at Boone County Sportsman Club gathering data for labeling and machine learning→ model training
- Experimented with rudimentary motion tracking program from online guides
- Started discussions on mobile application requirements
    - Application must know and "understand" rules of skeet shooting
    - Application must track the order of shooters in a squad and adjust accordingly, as determined by skeet shooting rules.
    - Review the "Project Plan - v1" for detailed requirements.
- Mike->Started cost analysis on hardware components
- Started using GitLab to track issues and work assignments

Pending Issues:

- Training data for skeet shots are in a single file, must be split into individual shots
- Background movement in videos proves to be a challenging issue to tracking
- Unknown hardware requirements for video processing

Individual Contributions:

Team Member	Contribution	Weekly Hours	Total Hours
Eva Kuntz	**Elicit mobile application requirements, project plan, discuss team design process and standards, Researched audio splicing and recognition methods**	**8**	**16**
Cole Huinker	**App requirements planning; video splicing and data labeling; Elicit hardware requirements and discussed computational power needs of hardware**	**8**	**15**
Steven Sleder	**Formatting and introduction for design plan, data labelling and video splicing, toy computer vision implementation, algorithm hardware requirements**	**8**	**14**
Michael Ruden	**Research into designing a single-board computer. Looked into several different microprocessors and components needed. Continue research into usable cameras.**	**8**	**14**
Philip Hand			**7**
Keith Snider			**2**

Plans for the Upcoming Week:

Below we list our plans for the upcoming week.

- Process and label training data videos
    - Label videos based on camera location
    - Label exact moment when clay first breaks
    - Determine whether we need more data for
- Continue research on machine learning algorithms
- Determine and specify hardware requirements
    - Research computational power needed
- Mike→Potentially use CAD tools to design rough estimate of prototype and a house for the prototype device
    - Include house dimensions and potential materials to use for house
- Determine the data processing pipeline and interfaces on device
- Eva & Keith->continue brainstorm about application
    - Goal by end of September: create a few concrete design specs/plans and have a rough development timeline estimate
- Plan for Cole's birthday party→ promotes team bonding and cohesion