**STATUS REPORT**

Date: October 12th, 2023

To: Rasool Salek Rostam

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Subject: Real-time Person Counting and Logging System October Progress

**SUMMARY**

This project's main aim is to develop a fully functional Real-time Person Counting and Logging System. Substantial progress has been achieved in October, and the central objective is to create a Python script for real-time person counting using a webcam feed, capitalizing on OpenCV for feed capture, and incorporating a pre-trained SSD MobileNet model for accurate person detection. Notably, the integration of the SSD MobileNet model into the system has been successfully accomplished, accompanied by the development of essential Python scripts for initialization and feed processing. The system excels in real-time individual detection within each frame, enabling live count computation, which is conveniently overlaid on the webcam feed for easy monitoring. Moreover, the system proficiently records daily counts in an Excel sheet and resets at midnight. Upcoming endeavors encompass fine-tuning, meticulous documentation preparation, rigorous testing, sustained automation through the Windows Task Scheduler, and tailored Excel sheet customization. The project remains steadfast in fulfilling its objectives, committed to delivering a reliable and functional Real-time Person Counting and Logging System.  
  
**BACKGROUND**

**SUMMARY OF FIRST TERM**

In the Real-time Person Counting and Logging System project, the initial design phase was successfully completed and endorsed within the first phase of the project timeline. In May 2023, at the project's outset, extensive research was undertaken to explore various configurations suitable for real-time person counting systems. After receiving client approval for the chosen system configuration, the design process was initiated. Throughout the initial four-month term, bi-weekly client meetings were conducted to present the evolving progress and have our design concepts and choices reviewed and endorsed to ensure client satisfaction. Towards the conclusion of this term, a comprehensive parts and budget list was meticulously compiled and received client approval, further solidifying the project's foundation.

**ISSUES IN FIRST TERM**

In the initial phase of the project, several challenges were encountered. Initially, we intended to utilize a Raspberry Pi camera and Raspberry Pi as key components of the system. However, unforeseen issues arose, necessitating a change in our approach. To overcome these challenges, we transitioned from the Raspberry Pi setup to a desktop system coupled with web cameras. This change allowed us to address the issues effectively and ensure a more reliable and robust configuration for the Real-time Person Counting and Logging System project.  
  
**PROGRESS**  
  
 **PLANNED WORK**

The following table is the original plan we had made which shows the upcoming tasks to be completed in the current reporting period.

|  |  |  |  |
| --- | --- | --- | --- |
| **Tasks** | **Description** | **Lead** | **Deadline** |
| Hardware Assembly | Assembled PC along with the peripherals(USB,Mouse,Keyboard). | Hiran | 17-Sep |
| Re-imaged the Desktop | New installation of Windows OS (Operating Systems). | Hiran | 24-Sep |
| Camera and Desktop Assembly | USB Webcam and PC connections | Hiran | 1-Oct |
| Wi-Fi Adapter Assembly | USB Wi-Fi adapter, as the internal Wi-Fi component was missing in our PC. | Mark | 8-Oct |
| Installation of Libraries for Python Script | Used a package manager to download and install required packages. | Jordan, Mark | 15-Oct |
| Adapted and optimized script | Originally wrote a script for a separate set of hardware and software (Raspberry Pi). Script is optimized for Windows OS. | Jordan, Aeham | 22-Oct |
| Code testing | Tested parameters used for tracking people, testing for most accurate results. | Jordan, Erik | 29-Oct |
| Camera and Desktop testing | Testing compatibility between hardware and accuracy of hardware working with the script. | Hiran | 5-Nov |
| Writing code | Researching online, used Python as our coding platform | Group effort | 12-Nov |
| Modify for multiple cameras | Optimizing script for multiple cameras | Jordan, Hiran | 19-Nov |
| Multiple cameras testing | Use client’s space to test camera’s performance | Group Effort | 26-Nov |
| Testing the System | Use client’s designated area and test the entire system in live environment | Group Effort | 3-Dec |
| Complete System | Presenting the system’s performance with client | Group Effort | 10-Dec |

**WORK DONE**

* Hardware assembly 100% complete.
  + Camera and Desktop Assembly 80% assembled, we are currently getting the system to work with one web camera, so we have time to modify for multiple cameras if needed.
  + The Wi-Fi Adapter Assembly is 100% completed, now the desktop can connect to the internet not only using Ethernet cable but also Wi-Fi Adapter as well.
  + Installation of Libraries for Python Script 100% completed to support the script to use libraries to fulfil script requirements.
  + Adapted and optimized script 100% completed, now the script supports Windows OS instead Raspberry Pi OS.
* Testing is 75% complete.
  + Code Testing 50% completed, through limited testing code is fully assembled for one camera.
  + Camera and Desktop testing 70% completed both camera and desktop detection of people is recorded.
  + Writing code 100% completed fully functional one web camera to detect people in the room.
  + Modify for multiple cameras, we must configure the hardware for two functional web cameras.
  + Multiple cameras testing must be done as soon as we configure the hardware set up for multiple cameras.
  + Testing the System will be the project's final phase once the script is also configured for multiple cameras.
  + Present the complete system to the client.

**PROBLEMS ENCOUNTERED**

* Hardware issues
  + The original plan was to utilize licensed cameras provided by the client. The cameras would only work with their own proprietary software and required purchasing licenses for the software. Our client was curious if we could create drivers that would allow the team to by-pass the licensing, but this was not feasible in the eight-month window. The team suggested the client allow us to utilize a Raspberry Pi module and Raspberry Pi Camera.
  + The Raspberry Pi also had its own set of issues as these units were shipped from out of Country. Once our team received the unit we tested and tested and could not get the Raspberry Pi module to connect to the internet over Wi-Fi. In conclusion we were shipped a faulty device. As a group we informed the client and decided mutually that ordering a new one would take too long to complete before the deadline. We decided to adapt and utilize a USB web cam and instead of using a Raspberry Pi Module, were using a dedicated PC to run our scripts and connect to the webcams directly. We managed this by adapting our software as well. Updating and configuring the script to work in a Windows based OS environment.

**FUTURE PLANS**

As our team advances towards the final stages of this project, we continue to identify innovative approaches to cater to client requirements. Our journey has provided us with insights and opportunities for process refinement, many of which were unanticipated at the onset.

Encountering challenges is an inherent part of any project, and we have faced our share. Still, by leveraging online research and available resources, we have effectively addressed these obstacles promptly.

In terms of infrastructure, we are currently poised to employ a Windows 10 system paired with two web cameras. As the project evolves, there's potential to transition to Windows 11 and procure enhanced camera equipment, contingent on our timeline. Concurrently, we remain committed to revising and optimizing our Python script whenever possible to ensure top-tier performance and functionality.