EE / CprE / SE 492 – sddec20-proj01
PROJECT TITLE : Machine learning for pilot biometrics
Week 11-12 Report

10/27/2020 – 11/09/2020
Client: Rockwell Collins
Point of contact: JR Spidell
Faculty Advisor: Akhilesh Tyagi

Team members:
Jianhang Liu--Data Manipulation SME
Feng Lin--Hardware SME
Xuewen Jiang --- Camera Interface SME
Xiuyuan Guo --- Algorithm SME
Sicheng Zeng - python SME 2
Junjie Chen --- C code SME
Sicheng Zeng - Team leader

Bi-weekly Summary

For these two weeks, we captured the results with our reduced neural network. With tuned
hyper-parameters, and rescued layers, we obtained 33% speed up with holding up to a 95%
accuracy compared to our baseline model. We are also working on our final report and poster,
documenting all the work we have done so far.

Individual Contributions

Xuewen - This week we continued the layout review and we finished it. We prepare to
order the daughter card and hope that will come soon. Then we start on the final report
and the poster. I will help to finish the poster and make it look nice.

Junjie Chen - This week we captured the matrix of tuned hyper-parameters, we ran and
compared the results with our baseline. With a reduced layer of neural network, we observed a
speed up of 33%.

Feng Lin-figure out why the face-detection project can compile. Learning some simulating tools in order to observious ML layers' performance.

Sicheng Zeng- Increase the accuracy of the pruning program. Combine all pruning work and see what area and data can be improved for accuracy and reduce the final size. Optimize the data and layer structure while changing the prune sparsity and epoch.

Xiuyuan Guo- During this time,Split the work from the original code and make the final change of the hyperparameter and adjust the model to the best result and save it.

Jianhang Liu- For the last week, Xiuyuan and I briefly summarized the results of different filters towards the time consumption and accuracy for the system, and I will show those results in the final report in more detail.

Team Member	Contribution	Hours Worked for the Week	Total Cumulative Hours
Junjie Chen	Rebuilt the DPU kernel with operation and architecture matching our project	5 h	83 + 5 = 88h
Sicheng Zeng	Combine and improve the prune program accuracy and size result	8h	54+10+9+8 = 89h
Xuewen Jiang	Finished the daughter card design, started on the final report and the poster, also updated the website.	5h	75h
Feng Lin	Documentation Vivado/Vitis software workflow.	6h	36h
Xiuyuan Guo	Split the work from the original code and make the final change of the hyperparameter and make the adjust to the model to the best result and save it.	10h	18+10=28
Jianhang Liu	Briefly summarized the results of different filters towards the time consumption and accuracy	5h	75h

Pending Issues

Combine teammates work together
Ran out virtual memory when building the DPU kernel

Plans

1. Optimize total latency about the pruned model running on board.
2. Increase after prune model accuracy
3. Increase swap space on host ubuntu machine to increase the RAM by swapping in between hard drive