

# **EE/CprE/SE 491 WEEKLY REPORT 10**

**03/1/2020 – 3/15/2020**

**Group number: sdmay20-36**

**Project title: Open-Source Prototyping of 5G Wireless Systems for Unmanned Ground and Aerial Vehicles**

**Client &/Advisor: Hongwei Zhang**

## **Team Members/Role:**

**Andrew Eschweiler – Algorithm Dev.**

**William Byers – Algorithm Dev.**

**Nathan Whitcome – OAI Integration Dev.**

**Samuel Stanek – OAI Integration Dev.**

**Ibrica Tutic – Project Manager**

**Nicholas Lorenz – Quality/Performance Analyst**

### ○ **Weekly Summary**

Continued development of CPS-VX2 algorithm and continued working on porting over files for SUMO into new version of OAI since the newest version got rid of most of the old SUMO files. The C client now contains calls to the TraCI API to obtain SUMO data. Also started investigating other visualization tools to aid with algorithm visualization and network status. Our server does not have enough RAM to run the Jenkins build consistently so looking into other options here. Seems that we might have to run the CI/CD server in CloudLab or something similar, but its not really high priority at this point.

### ○ **Summary of Weekly Advisor Meeting**

Discussed running the network simulator, the CPS-VX2 algorithm, and the interface between SUMO and OAI. We had planned on plotting the vehicle and network scenario on the screen, but it seems that the interface between SUMO and OAI is more important, so work on the visualization is going to slow down to support the interface work. We are continuing to work on the EPC to facilitate the communication between the UE and the eNB.

○ **Past week accomplishments**

- **Ibro:** Started a VM in ClouLab to test cloud deployments of OAI. Configured UE and eNB, working on solving some errors on the system where we are building the EPC. Once EPC is running, testing can start and the UE's and eNB's can communicate.
- **Will:** Created a comparison between PRKS and CPS using the previous analysis and documentation. Also created a comparison between PRKS and UCS using the previous analysis and documentation.
- **Nathan:** Switched to using visual C++ instead of GTK+ to create a GUI for the system. Looked into creating a plugin for SUMO that allows us to overlay UE and eNB information.
- **Sam:** Continued porting over sumo files. Got socket\_traci\_OMG, storage\_trace\_OMG, and TraCI\_Constants ported over and was able to build them along with the other OMG files. Still need to port and build client\_traci\_omg and sumo.c.
- **Drew:** Looked at algo. Structure and different OAI versions.
- **Nick:** Seemingly finished with the power analysis code for the system.

○ **Pending issues**

Our system does not have the RAM to support the Jenkins build system. The testing phase uses 4 VM's, each which require between 4 and 8 GB of RAM. This slows down the system considerably when running CI/CD on the OAI codebase. Looking into moving this to ClouLab.

○ **Individual contributions**

<b><u>Name</u></b>	<b><u>Individual Contributions</u></b>	<b><u>Hours this period</u></b>	<b><u>Hours cumulative</u></b>
Andrew Eschweiler	Looked at algo. Structure and different OAI versions.	8	78
William Byers	Compared PRKS/CPS and PRKS/UCS algorithms	12	102
Nathan Whitcome	Started to learn visual C++ to create a simulation GUI	10	83
Samuel Stanek	Was able to port over and build some of the old sumo files, only have a few more to port.	10	106
Ibrica Tutic	Configured OAI v1.2.1 UE and eNB. Created ClouLab system to test OAI cloud deployments.	11	141
Nicholas Lorenz		4	68

○ **Comments and Extended Discussion**

○ **Plans for the Upcoming Period**

- **All:**
- **Ibro:** Get the EPC up and running and move the build system to cloud lab. Test the simulator by having the UE and the eNB communicate. Setup multiple UE's and eNB's and test that network configuration.
- **Will:** Analyze comparisons between PRKS and the other algorithms, and then extrapolate that outfor CPS-V2X from UCS. Create a preliminary design for CPS-V2X. Meet with advisor to make sure understandings of the algorithms are correct.
- **Sam:** Finish porting over the last couple sumo files and building them. Once they are ported, need to work on adding them to the makefile lists in the cmake folder so that it builds with the rest of OAI.
- **Nathan:** Learn more about visual C++ and communicate with Sam about reading in information from his program.
- **Drew:** Look at Ibro's build, look at and understand the requirements of our new platform Cloudlab.
- **Nick:** ask instructor to run my program on the system to see if it works and to what degree it works.