

# **EE/CprE/SE 491 WEEKLY REPORT 09**

**02/15/2020 – 3/01/2020**

**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**

Finished porting over physical abstraction from the old version of OAI to the current one and made a merge request. Set up Jenkins on the team's server to aid with continuous integration and development. Continued development of CPS-VX2 algorithm. Still 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(openair2/UTIL/OMG). Was able to compile most but some are few are missing libraries from old version. Finished implementing TraCI libraries with the C client so there is no need for a python script anymore. Started looking into a C++ program to map out eNB and UE system.

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

Discussed three main tasks of the project. Advisor provided some resources for the algorithm analysis/comparison. Discussed the build system being set up and its advantages. One of the advisor's graduate students is helping with the PHYS abstraction and getting OAI up and running. Talked over the progress since the last meeting and made sure effort wasn't being wasted on less important or redundant tasks.

- **Past week accomplishments**
  - **Ibro:** Moved all files necessary for physical layer abstraction into a merge request for review. Started building a build system for CI/CD to allow for many developers to work on the code without worrying about breaking things. Build system is live at sdmay20-36.ece.iastate.edu:8080.
  - **Will:** Finished analyzing the CPS algorithm and documentation. Also finished analyzing UCS algorithm and documentation.
  - **Nathan:** Worked on finding a framework that works with C++ that can be used to create a graphical representation of a eNB and UE system.
  - **Sam:** Finished implementing the TraCI C library for the c client so we don't need the python script (tested outside of OAI, still need to finish building in OAI). Started looking into program to map eNB and UE system.
  - **Drew:** Research PKRS Algo. And looked at the differences between .5.2 and 1.2.1
  - **Nick:** Figured out that I need to use the info that I get directly from the system to do proper power calculations
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- **Pending issues**
  - Still running into issues with dependency analysis. Hoping to solve this by allowing many people to make changes via the build system.
- **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	Research PKRS Algo. And looked at the differences between .5.2 and 1.2.1	10	70
William Byers	Analyzed CPS and UCS procedures/processes	12	90
Nathan Whitcome	Working on getting GTK working to start creating a GUI	12	73
Samuel Stanek	Finished implementing the c client with the old OAI TraCI library to get rid of the python script. Worked on adding and building the c client and the TraCI libraries in the new OAI	12	96
Ibrica Tutic	Moved all files necessary for PHYS abstraction. Started workings on a Jenkins build system to verify merge requests and run tests. Build system is live at sdmay20-36.ece.iastate.edu:8080.	14	130
Nicholas Lorenz	Figured out that I need to use the info that I get directly from the system to do proper power calculations	9	64

○ **Comments and Extended Discussion**

SUMO compatibility with the new version of OAI has slowed down progress and is taking longer than initially thought. There are only a few files needed that actually run and connect SUMO to OAI but building them in the new OAI has been difficult because these few files have many dependencies that aren't needed/included in the new version. This should finish within the next week and move into functionality testing.

○ **Plans for the Upcoming Period**

- **All:**
- **Ibro:** Finish the build system and begin working on the physical layer abstraction dependency analysis. Analyze the nfapi simulator, as it might be a way to do physical layer abstraction without having to port over all the code.
- **Will:** Create a comparison between PRKS and CPS/UCS. Work with advisor to determine best way forward for implementing UCS to CPS-V2X.
- **Sam:** Figure out how to get TraCI C libraries to build in the new version of OAI and start testing functionality once done.
- **Nathan:** Run some basic tutorials with GTK and learn how to correctly use the library.
- **Drew:** Continue looking at the algorithm and structure of different OAI versions.
- **Nick:** Kept working on the programming portion of the power analysis system