

Assignment 2 - Current and Future Network Technologies

Objective: Due 11:59 PM PST, May 9th, 2022

In this assignment, your job is to prepare a three page (1400-1600 word) report/essay about one of the topics given below. The write-up should be in 11 point font, with single-line spacing. This is *not* a group assignment. Submit the paper as a pdf on the [Gauchospace submission](#).

Overview

The paper should be in the following format -

- **Abstract:** 1 paragraph. The first sentence describes the problem at a high level, i.e. what purpose does your technology solve? The second states what technology you are writing about. The third and fourth, and maybe fifth sentences should briefly overview the technology.
- **Introduction:** 2-3 paragraphs describing the problem your technology addresses. The first paragraph is very high level, and the next one-two paragraphs introduce your topic in more detail.
- **Technical Description:** 1-1.5 pages. Describe how your technology operates. Give a specific example including a figure (draw this yourself using, for example, powerpoint, inkspace, etc.). Be sure to reference your figure and describe its components.
- **Performance:** about 0.5 page. If applicable to your technology, include information on how well your solution performs. To do this, you will need to directly cite other work that has evaluated its performance. Include at most one graph that demonstrates the performance, being sure to indicate in what type of network and experiments the performance was evaluated and what the results show.
- **Conclusion:** Summarize your paper in about 1 paragraph. If applicable, use a second paragraph to comment on the future outlook for the technology – is it gaining in widespread deployment? Has it experienced any major roadblocks or performance problems? Are people generally satisfied with it? What do you think will happen in the next 5 years? 10 years? etc.
- **References:** Include your references with proper citations. Be sure to refer to the references throughout the paper as appropriate. You must use at least three references. One of these references MUST be a published research paper, not a news article. Use Google Scholar to find a recent technical paper related to your topic. Cite a website as **Website name, or author name. "Title of article." Associated publication/college/etc. Date of access. URL.** Example - Staub, Jerry. "The Development of the Union Strategy." Ohio State University eHistory. 4 October 2012. <http://ehistory.osu.edu/uscw/features/articles/ArticleView.cfm?AID=70>. Do not just include the URL without the other information.

Grading Guidelines:

Your report will be graded based on the following components:

1. Presentation style and clarity (3/15)
2. Technical depth; we encourage you to clearly describe the technical details of the covered technology in as much details as possible (7/15)

3. Length of the essay, which should not be less than 1400 words and not more than 1600 words (3/15)
4. Proper citations (2/15)

Resources/Help:

1. [High level tips for writing a good essay](#).
2. [Tips for writing a more detailed technical paper](#) (but still worth reading for this assignment).
3. Any paper that quotes or refers to the work of another person should include a citation or reference to that work. A guide to writing citations can be found [here](#).

Plagiarism policy:

Be very careful to describe the technology in your own words. If you extract any quotations from a reference, be sure to put that quotation in quotes (" ") and include a proper citation. Your paper should, in general, be written in your own words and should contain minimal direct quotes. Do not copy figures directly from published work without directly citing them. Your report may include at most one performance graph from a published work and must be properly cited. You must draw any architectural drawing of the operation of your technology. Failure to properly cite original sources constitutes plagiarism. Part of the purpose of this assignment is to learn how to cite published work properly. Please consult with the instructor or the TA if you have any questions in this regard.

We won't award any grade point for this assignment if we detect any plagiarism in the submitted report.

Topics

- Open Radio Access Networks (RAN)
- 5G for Industrial IoT applications
- 6G Networks
- Broadband for Rural/Tribal Areas
- Network telemetry for cellular networks
- New 802.11 protocols (e.g., ax, ay, ba, etc.)
- OpenWRT routers (Hint: telemetry systems based on OpenWRT routers)
- Gigabit Passive Optical Networks (GPON)
- Open source projects on 5G networks (e.g., AETHER), GPONs (e.g., VOLTHA)
- DOCSIS 4.0
- Virtual CMTS
- Proactive network management (PNM)
- Programmable packet scheduling (e.g, PIFO, SP-PIFO, etc.)
- Video conferencing technologies/applications (e.g., WebRTC, Zoom, Microsoft Teams, Google Hangout, etc.)
- Cloud-based gaming applications
- Video streaming applications (e.g., Netflix, Hulu, etc.)
- Internet speed measurement systems (e.g., Speedtest, speedchecker, fast.com, etc.)

This is a reference list. If you'd like to explore a topic not covered in this list, please let us know. We will be more than happy to help.