Homework Assignment: Reading and Summarizing Research Papers

Deadline: April 4, 2025

Objective

This homework is designed to give you a sense of what it's like to read and engage with research papers. We will be focusing on papers related to the transport layer.

Instructions

1. Read the following guide on how to read a research paper:
   How to Read a Paper (by S. Keshav)
2. Read the research paper:
   Data Center TCP (DCTCP)

   > You are expected to go through **at least the first two passes** as described in the Keshav paper. Since you are very new to the field, you are not expected to understand everything the paper is saying.
3. Write a summary (300 to 500 words) of the DCTCP paper based on your reading. Your summary should reflect your understanding after two passes.
4. Look at research papers that are closely related to DCTCP or are addressing a similar problem. The paper mentioned in point 1 explains how to find them. From those:
   - Pick 7–10 papers that look interesting to you and read **only their abstracts**.
   - Prefer papers from top venues such as SIGCOMM, HotNets, etc.
   - Here are some suggestions to start with:
     - pFabric: Minimal Near-Optimal Datacenter Transport
     - PIAS: Practical Information-Agnostic Flow Scheduling
     - RepFlow: Minimizing Flow Completion Times
     - TCP ex Machina: Computer-Generated Congestion Control
   - Write a 2 to 3 sentence summary of the abstracts

5. From those papers (whose abstracts you read), choose 2 papers you found most interesting. Read both of them. Again two passes are expected. Write a 300–500 word summary for each of the two papers. Furthermore, Identify strengths and weaknesses of each paper (200 - 300 words).

Submission

Please submit a single document (PDF) that includes:

- Your summary of the DCTCP paper.
- A brief list of the 7–10 papers you explored with their titles and abstracts along with the 2-3 sentence summary.
- The 300–500 word summaries of the two papers you selected. 200 - 300 word summary of the strengths and weakness that you identify.