

## **Edit Notes for “Optimizing and Modeling Dynamics in Networks”**

First, thanks to the reviewers for the very thorough and helpful feedback, which helped improve the presentation of this chapter.

The required LaTeX heading was used, and the reviewers’ comments were addressed as follows. Please let me know if I should provide further details, or if there are further suggestions. Thanks,

ibrahim

### **Reviewer #1:**

The introduction was revised to describe better and in more detail the contents of this chapter, with paragraphs on “Expected Background” and “Contribution and Outline”. More references were added for further readings and an explicit bibliography section was added. These references also point to actual network protocols (e.g., TCP Reno, TCP Vegas, RED) that are mathematically modeled in this chapter.

The text was revised to ensure consistency in numbering equations and to improve exposition, including better formatting, correcting typos, and adding clarifications.

### **Reviewer #2:**

More references were cited to point students to further readings, and to point to actual network protocols and further justification to the mathematical models that this chapter contains.

The background expected from readers/students was revised to include basics of systems modeling, optimization theory, Laplace transforms, and control theory, and the textbook “Mathematical Foundations of Computer Networking” is now cited as a reference. We retained the background material provided in this chapter to serve as a refresher or quick reference.

An overview of each section was added leading to / at the beginning of each section.

Clarifications were added on when linear control models apply and assumptions are made more clear and explicit.

The reviewer suggested that the material on modeling feedback using Nyquist plots might be removed since it might be too advanced and not self contained. We revised this text to clearly define the terms, and by providing a reference on Nyquist stability criterion to provide further detail, we retained this section since it could be useful in giving the basics of such feedback analysis, and students can understand

that control loop delays have serious impact on stability and how the analysis can account for such delays. In the revised introduction, we noted that this material could be skipped on a first reading.

The reviewer suggested that sections 7 and 8 might not be important. We agree that they could be skipped as they only provide case studies on applying what has been learned in this chapter. The sections were labeled “Case Study: ...” and the revised introduction clearly states that they could be skipped. Section 7 models class-based queuing, and Section 8 models transfer over multiple TCP connections. In the revised version, references are provided to provide further justification for the models.

The text was revised to include all suggested clarifications, to fix typos and grammatical errors, and improve notation consistency, formatting and presentation.