



Computer Science

Opponent(s):

Zak Blacher, Anja Fischer

Respondent(s):

Rickard Karlsson, Mats Persson

**TOM++ - Estimating One-Way Delay in
Wireless Mesh Networks**

1 A General Evaluation of the Project

The whole project seems to be completed successfully. Based on the first TOM version some changes have been made and the new performance has been tested and evaluated critically. All background knowledge needed to understand the project and its objective was provided. However, it can be seen that there was a lack of time to implement another version of TOM++ using the Kalman filter.

2 Comments on the Project in Relation to the Dissertation

In our opinion the dissertation shows what the project was about very well. Details are given, sometimes longer descriptions would have been nice to make understanding easier but in general all needed information is in there.

2.1 Title

The title mentions all important parts of the project: TOM, the measurement tool, the thesis' objective – measuring the delay, and wireless mesh networks - the testbed.

2.2 Dissertation Layout

In general the layout is very good, both text and images are easy to read. However, the layout is not following all guidelines given on Donald's website. Every part should start on a right hand side (chapters, table of contents, references). In section 3.3 the margin is off on one page.

2.3 Scientific Method

A lot of literature studies have been done. Further reading to understand the testbed and the previous TOM implementation was necessary, too. All choices, such as using specific values for matrices or how to calculate various delay times, were explained in detail which is very good. Implementation and evaluation results are discussed critically and mistakes or wrong approaches are mentioned to prevent the same mistake in future.

2.4 Argumentation and Conclusions

Argumentation was correct but a little informal in some aspects. A few logical jumps were made without a full explanation.

2.5 The Abstract

There are too few details given. Of course, the abstract has to be short but starting to explain TOM and the one-way delay measurement is maybe not the best way to do it. A short summary about mesh networks and the requirements for packets to be sent as quickly as possible through the network would have been better. Then an explanation of how to measure the delay and why this is important could have followed.

2.6 Language Aspects

“is” and “are” got mixed up several times. Sometimes the word order is Swedish rather than English. Random capitalization issues.

2.7 References and Sources

All references follow the same layout which makes them easy to read. All important information is given here, sorted alphabetically. Information about when a website has been visited should be added.

2.8 General Comments on the Project

The project seems to be interesting considering problems of described services such as VoIP, where packets need to be forwarded in a rather short time. In this context the measurement of a packet's delay is very useful to be able to prioritize certain packets.

3 Chapter by Chapter Evaluation of the Dissertation

3.1 Chapter 1

The introduction is good. It introduces mesh networks and the need to approximate a

packet's delay in the network to improve several services such as live streaming and VoIP. It also presents the objective of this thesis, the improvement of an already existing measurement tool, TOM. The structure of the whole thesis is also presented here which helps the reader to get an overview of what will be discussed in the following chapters.

3.2 Chapter 2

Well structured and good explanation of all important components: mesh network, testbed, Section 2.3.1 – Active Monitoring: the description of active monitoring is easy to understand but it is not explained why this is needed here. Maybe a shorter section would have been sufficient.

Section 2.4 – Kalman filter: good and short overview as well as the description why this filter is used and needed in this project/thesis.

Page 14, Kalman equations: what is K? Matrix? What does it describe?

3.3 Chapter 3

Very good introduction for the following sections as every section describes one of the mentioned requirements.

3.4 Chapter 4

Formula 4.1 (p. 25) ??? Formula 4.8 shows addition instead of subtraction

p.26: why resetting both estimating functions to zero? Because no previous data is available to estimate the new delay times?

Good: detailed description of used values, criticizing own mistakes

before specifying formula 4.9 → error, has to be updated to d_{P2}

very good: example in section 4.5, helps a lot to understand the whole calculation process

3.5 Chapter 5

Introduction paragraph defines some terms which helps to make things easier to understand

Formula 5.1: absolute value on inside of sigma?

Simple and easy to read graphs (except the color, blue and green are hard to distinguish)

3.6 Chapter 6

Good summary of the whole thesis and of encountered problems (Kalman filter).

Good description of possible future work and further improvements as well as critical statements regarding your own work.

3.7 General Comments on the Dissertation

The whole structure of the dissertation is thought out well and reasonable. All information is given, however, sometimes the explanations are very short which makes it necessary to read certain paragraphs again and again.

4 Final Comments