

## BORANG PENGESAHAN STATUS TESIS\*

EFFECT OF THE VIDEO RESOLUTION ON QUALITY OF EXPERIENCE IN  
JUDUL : WIRELESS MULTIMEDIA STREAMING

SESI PENGAJIAN : 2012 / 2013

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**EFFECT OF THE VIDEO RESOLUTION ON QUALITY OF EXPERIENCE  
IN WIRELESS MULTIMEDIA STREAMING**

**NOOR AZIE IZZATI BINTI NOOR AZMAN**

This report is submitted in partial fulfillment of the requirements for the  
Bachelor of Computer Science (Computer Networking)

**FACULTY OF INFORMATION AND COMMUNICATION TECHNOLOGY  
UNIVERSITI TEKNIKAL MALAYSIA MELAKA  
2013**

## DECLARATION

I hereby declare this project report entitled  
**EFFECT OF THE VIDEO RESOLUTION ON QUALITY OF EXPERIENCE  
IN WIRELESS MULTIMEDIA STREAMING**

is written by me and is my own effort and that no part has been plagiarized without  
citations.

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## **DEDICATION**

This work is dedicated to my beloved family and siblings, who passed on a love of reading and respect for education.

To my supportive friends, my supervisor and all lecturers, thank you so much for assist and help.

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Alhamdulillah, Thanks to Allah SWT, because give me opportunity to complete my Final Year Project which is title Effect of the Video Resolution on Quality of Experience in Wireless Multimedia Streaming. This final year project report was prepared for Faculty of Information and Communication Technology (FTMK), Universiti Teknikal Malaysia Melaka (UTeM), basically for student in final year to complete the undergraduate program that leads to the degree of Bachelor of Computer Science.

First of all, I would like to thanks to, my supervisor, Dr. Zul Azri Muhamad Noh for his technical guidance and valuable time in assisting us in the accomplishing these project. I also want to thanks to all lecturers for their cooperation, valuable information, suggestions and guidance in the compilation and preparation to complete the final year project report.

Finally, thanks to my lovely parents, family, and friends for their understanding, cooperation and full of support for the report completion, from the beginning till the end of this project. Also thanks to everyone, that has been contributed by supporting my work and helps myself during the final year project progress until it is fully completed.

## **ABSTRACT**

This project is to identify the original video in difference resolution with the same compression. The project will be carried out to identify the good and the best resolution of the video. In addition, the Windows OS will be used for the effort to further develop this project and the benefit of using Windows OS for video streams is not expensive and easy to use. This project will use software tool VLC media player, Search Everything, MyFFVideoConverter and also Wireshark to analyze and capture data. In this project will have 1 server and 3 clients of Windows PCs. Windows Server will be used in Search Everything, media player (VLC) and provide the IP address for IPv4 users in the same network. A detailed explanation of how to install and identify the project will be shown. There are four PC that IPv4 will identify data packets and the speed at which most suitable for flow in a network. The objective of this project is to analyze study and identify the effect of video resolution on quality of experience in wireless multimedia streaming.

## **ABSTRAK**

Projek ini adalah untuk mengenal pasti video asal dalam resolusi perbezaan dengan mampatan yang sama. Projek ini akan dijalankan untuk mengenal pasti baik dan resolusi terbaik video. Di samping itu, Windows OS akan digunakan untuk usaha untuk memajukan lagi projek ini dan manfaat menggunakan Windows OS untuk aliran video tidak mahal dan mudah untuk digunakan. Projek ini akan menggunakan perisian alat VLC pemain media, Search Everything, MyFFVideoConverter dan juga Wireshark untuk menganalisis dan menangkap data. Dalam projek ini akan mempunyai 1 server dan 3 pelanggan PC Windows. Windows Server akan digunakan dalam Search Everything, pemain media (VLC) dan memberikan alamat IP untuk pengguna IPv4 dalam rangkaian yang sama. Satu penjelasan yang terperinci bagaimana untuk memasang dan mengenal pasti projek ini akan dipaparkan. Terdapat empat PC yang IPv4 akan mengenal pasti paket data dan kelajuan di mana yang paling sesuai untuk aliran dalam rangkaian. Objektif projek ini adalah untuk menganalisis kajian dan mengenal pasti kesan resolusi video kepada kualiti pengalaman dalam streaming multimedia tanpa wayar.

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## LIST OF ABBREVIATIONS

AVI	Audio Video Interleave
CD	Compact Disc
CPU	Central Processing Unit
DVD	Digital Versatile Disk
Fps	Frames per second
GB	Gigabyte
GHz	GigaHertz
H.264	, DIV3, MPEG-4
HTTP	Hypertext Transfer Protocol
IP	Internet Protocol
MPEG	Moving Picture Expert Group
NTFS	Network Technology File System
PC	Personal Computer
Ppi	Pixels per inch
PSM	Projek Sarjana Muda
QoE	Quality of Experience
RAM	Random Access Memory
RO	Research Objective
RP	Research Problem
RQ	Research Question
VCD	Video Compact Disc

VLC	VideoLan Client
VOB	Video Object
WMV	Windows Media Video

## **CHAPTER 1**

### **INTRODUCTION**

#### **1.1. Project Background**

Video today is fundamentally changing business communication. Video is increasing communication efficiency and emergency the cost of the company around the world. Video is displaying moving image and text that can be represented in computer monitor, smart phone or television. Video Streaming is real time data transport, where the content is compressed while it is delivered. Frame size is measured in number of horizontal pixels times the number of vertical pixels, e.g. 160x480 or 160x120. The size is depends on the CPU power and the Internet connection bandwidth. Frame rate is measured in number of images frames per second (fps).For the web streaming, 10 or 15 frames per second (fps) is more appropriate and produces fair smooth quality for the user.

In addition, the display resolution of a digital television, computer monitor or smart phone is a measurement of the number of pixels displayed on screen. Two types of video resolution are spatial and temporal. Spatial resolution is total number of pixels contained in each individual frame while, temporal resolution is number of frames per second. To compensate jitter variance of the end to end delay at the receiver, a portion of the received data is buffered in a play-out buffer. The video content is rendered on the screen with the signaled frame rate, making the inter-packet arrival time variations invisible for the user. Therefore, the end user quality for video streaming does not depend on the absolute end to end delay. Thus, video streaming is usually referred to as real time service.

## 1.2. Problem Statement

Nowadays, there are many problems to differentiate the resolution in high definition image format and standard definition image format. This characteristic causes the difficulty to maintain and choose the best resolution video image. The Research Problem is summarized into Table 1.1. Table 1.2 shows the research problems and research questions in this project.

Table 1.2.1: Research Problem

RP	Research Problem
1	Difficult to differentiate the type of resolution of video image for display resolution
2	Effect of video resolution in QoE is not clear
3	Difficult to choose the suitable or best display resolution for image

Table 1.2.2: Research Question

RP	RQ	Research Question
1	1	How to differentiate the type of resolution of video image?
2	2	How to reduce interruption of video resolution in QoE during multimedia streaming?
3	3	How to choose the suitable or best display resolution for image?

RQ1: How to differentiate the perceived sharpness of image?

This research question is formulated by considering on the type of resolution of image issue which is high definition resolution and standard definition resolution as highlighted in RP1 in Table 1.1. This RQ1 is the primary guides to formulate the research objectives (RO1) of this project.

RQ2: How to reduce interruption of video resolution in QoE during multimedia streaming?

This research question is formulated by considering the performance of Quality of Experience to reduce interruption of video resolution issue during streaming as highlighted in RP2 in Table 1.1. This RQ2 is the primary to formulate the research objectives (RO2) of this project.

RQ3: How to choose the suitable or best display resolution for image?

This research question is formulated by considering the suitable or best display resolution for image issuer which is the best resolution as highlighted in RP3 in Table 1.1. This RQ3 is the primary guides to formulate the research objectives (RO3) of this project.

### 1.3. Objective

Table 1.3.1: Research Objective

RP	RQ	RO	Research Objective
1	1	1	To study the effect of video resolution in performance on QoE
2	2	2	To monitor the delay and throughput during video streaming
3	3	3	To identify the suitable or best display resolution for image

RO1: To study the effect of video resolution in performance on QoE

After determine the size of video resolution, we measured the image in difference resolution based on size of resolution that has been analyzed.

RO2: To monitor the delay and throughput during video streaming

After get the video, we monitor the delay and throughput during stream session.

RO3: To identify the suitable or best display resolution for image

The data collected that has been compared, we can choose the best resolution.

## **1.4. Scope**

This project is to analyze the effect of the video resolution on quality of experience in wireless multimedia streaming. Scope of project is going to be conducted as follows:

- a) Size of video
  - Size of video to at least 128x196 pixels at 25fps.
  
- b) Quality of video
  - Depends on size of video and difference resolution of video that will be used.
  
- c) Difference resolution of video
  - Difference standards of resolution.
  
- d) Same compression
  - Will analyze in difference type of resolution but with the same compression.

## **1.5. Project Significant**

The idea is to analyze the effect of the video resolution on quality of experience in wireless multimedia streaming when each video streaming using difference resolution size.

## 1.6. Report Organization

i. Chapter 1: Introduction

This chapter will discuss the introduction, project background, research problem, research question, research objective, scope, project significant and report organization.

ii. Chapter 2: Literature Review

Next chapter will explain the related work of this project, such as size of video resolution, quality of video and type of resolution.

iii. Chapter 3: Methodology

This chapter will explain the method to use in analyze the resolution video and organize the sequence of project in phase by phase.

iv. Chapter 4: Design and Implementation

This chapter will introduce the software and hardware use in this project, environment setup, implementation of personal computer as well as the sample data collected.

v. Chapter 5: Testing and Analysis

Next chapter will analyze the data that has been collected and will carry out to support the result.

vi. Chapter 6: Conclusion

Last chapter will summarized all chapters as a conclusion.