STATISTICAL TIME DIVISION MULTIPLEXING ARCHITECTURES AND DESIGN

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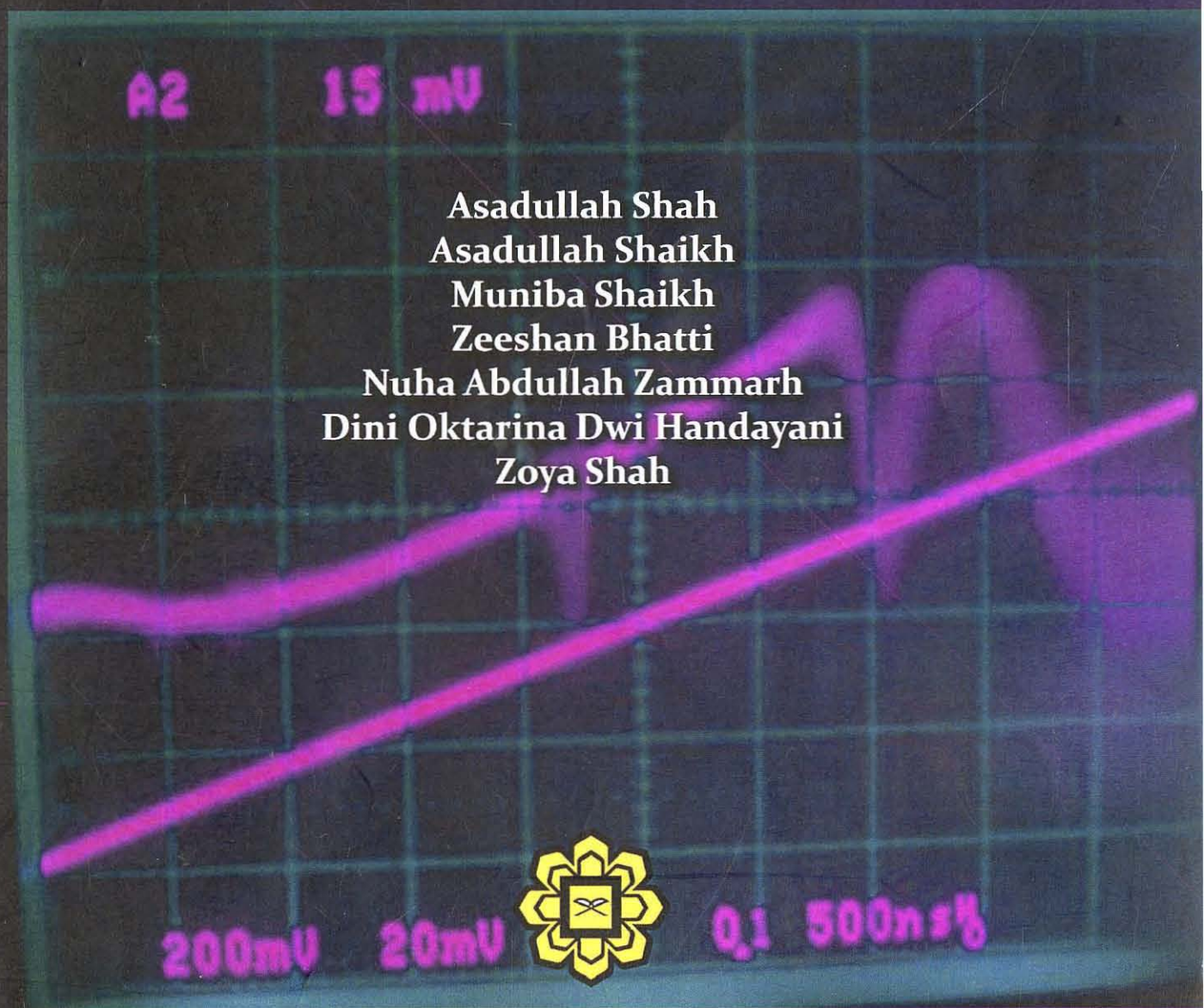

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24. Networking Issue

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24.0 Abstract

All communication networks use or going to use packet based communications that intrinsically use STDM for communication. No user is going to have a fixed time slot instead, a slot is allocated on a demand basis or activity basis. The packet discarding is a new concept in networking, in this chapter a random packet discarding is explained.

24.1 Introduction

The bandwidth efficiency of a frame or packet based multiplexer system is often evaluated in terms of DSI advantage achieved either introducing delay in the system, or discarding frames during higher activity periods. The proposed multiplexing system simulation is based on the latter (frame discarding) concept and is introduced newly in the area of multiplexing. The speech quality suffers due to frame discarding and the quality becomes perceptually annoying beyond a certain frame loss rate. Loss of speech frames is compensated for by reconstructing the discarded frames. The degree of quality deterioration can be measured either by an objective test procedure in time, frequency domain or by listening judgments. Techniques have been developed however, which provide alternative approaches, such as MOS related numerical measures [49] [69].

In section 6.2 a brief methodology of measuring speech quality in simulation has been de-scribed in which the frame loss effects are evaluated. In section 6.3 the random frame discarding technique and performance in terms of DSI advantage, is described. Description of the cyclic frame discarding technique and its performance is presented in section 6.4. The first criterion based scheme, mean square error, is evaluated in section 6.5. Section 6.6 is based on the simulation in which frames are discarded on the energy difference in original and recon-structed frame. In section 6.7, the last criterion based scheme, which is in frequency domain spectral envelope measure and frame discarding results are presented. Finally section 6.8, is the conclusion of this.