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AIN SHAMS UNIVERSITY
FACULTY OF ENGINEERING
Electronics and Communications Engineering Department

Performance Of Automatic Repeat Request (ARQ) Protocols

A Thesis

Submitted in Partial Fulfillment for the Requirements
of the Degree of Master of Science in Electrical Engineering
(Electronics and Communications Engineering)

Submitted By

Wael Mohammad Atteya Omar

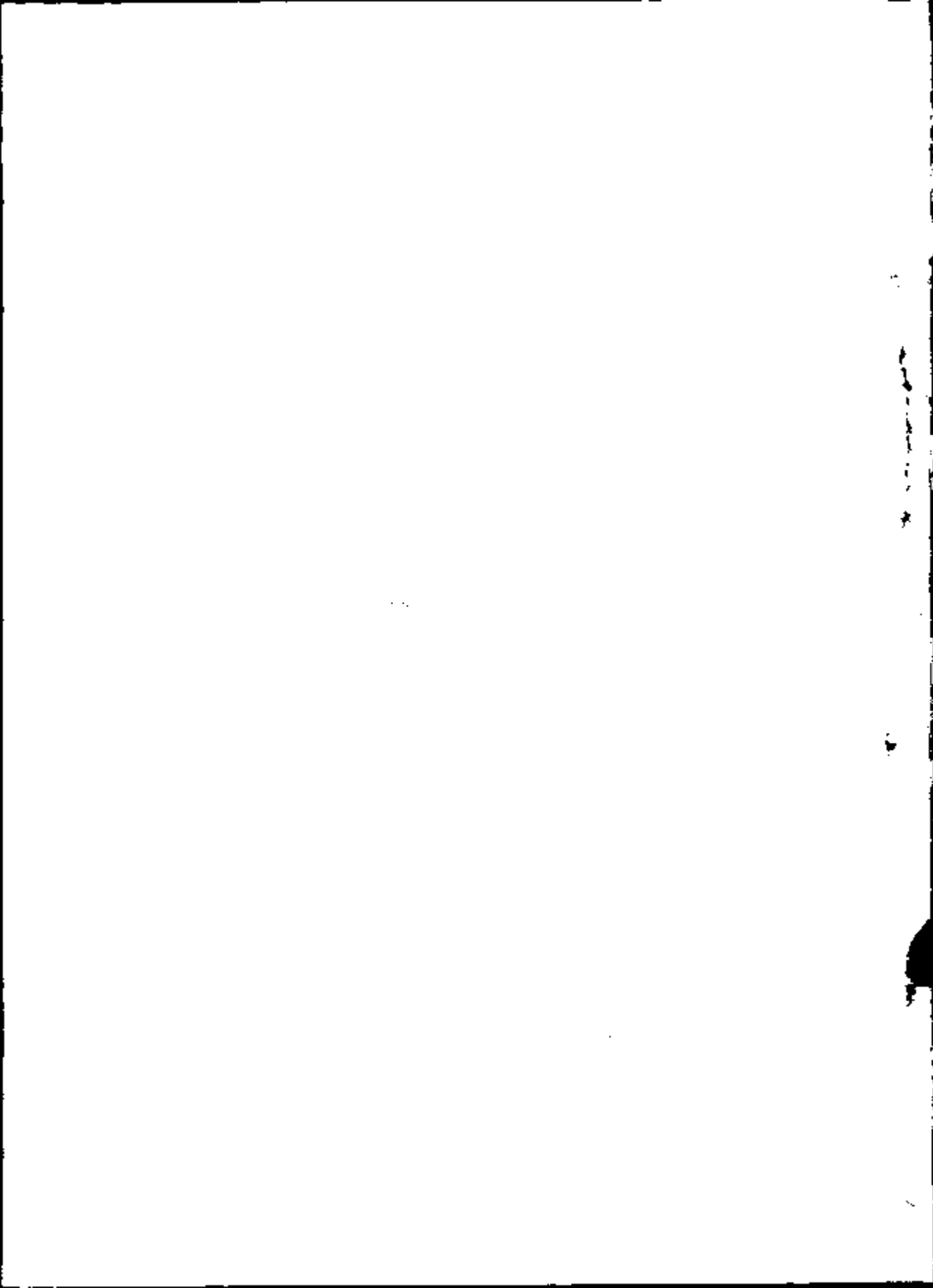
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(Electronics and Communications Engineering)
Ain Shams University, 2000

Supervised By

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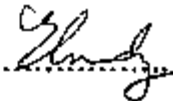
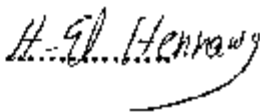
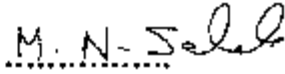
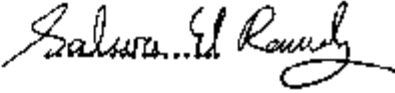
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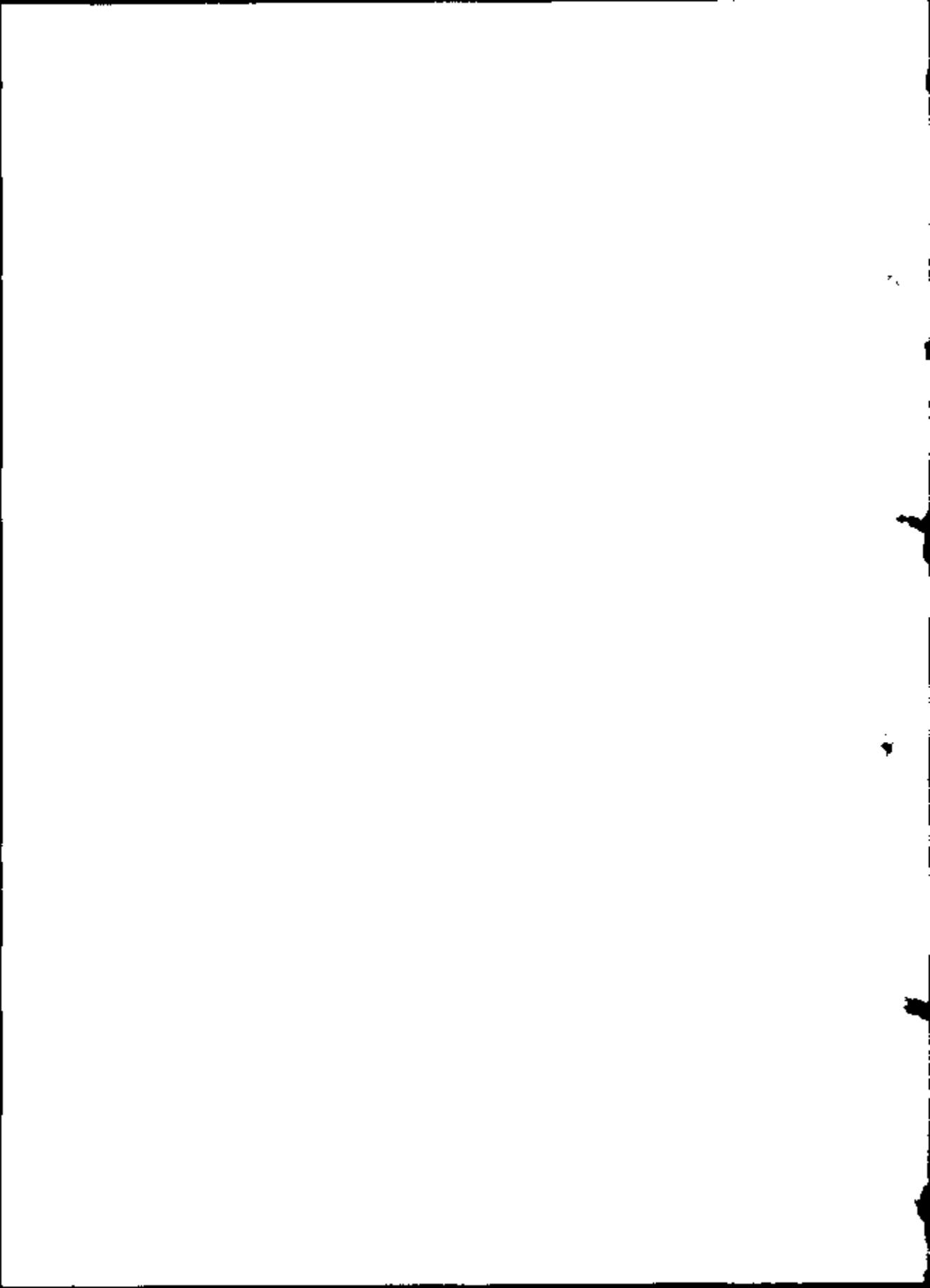


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STATEMENT

This dissertation is submitted to Ain Shams University for the degree of Master of Science in Electrical Engineering (Electronics and Communications Engineering).

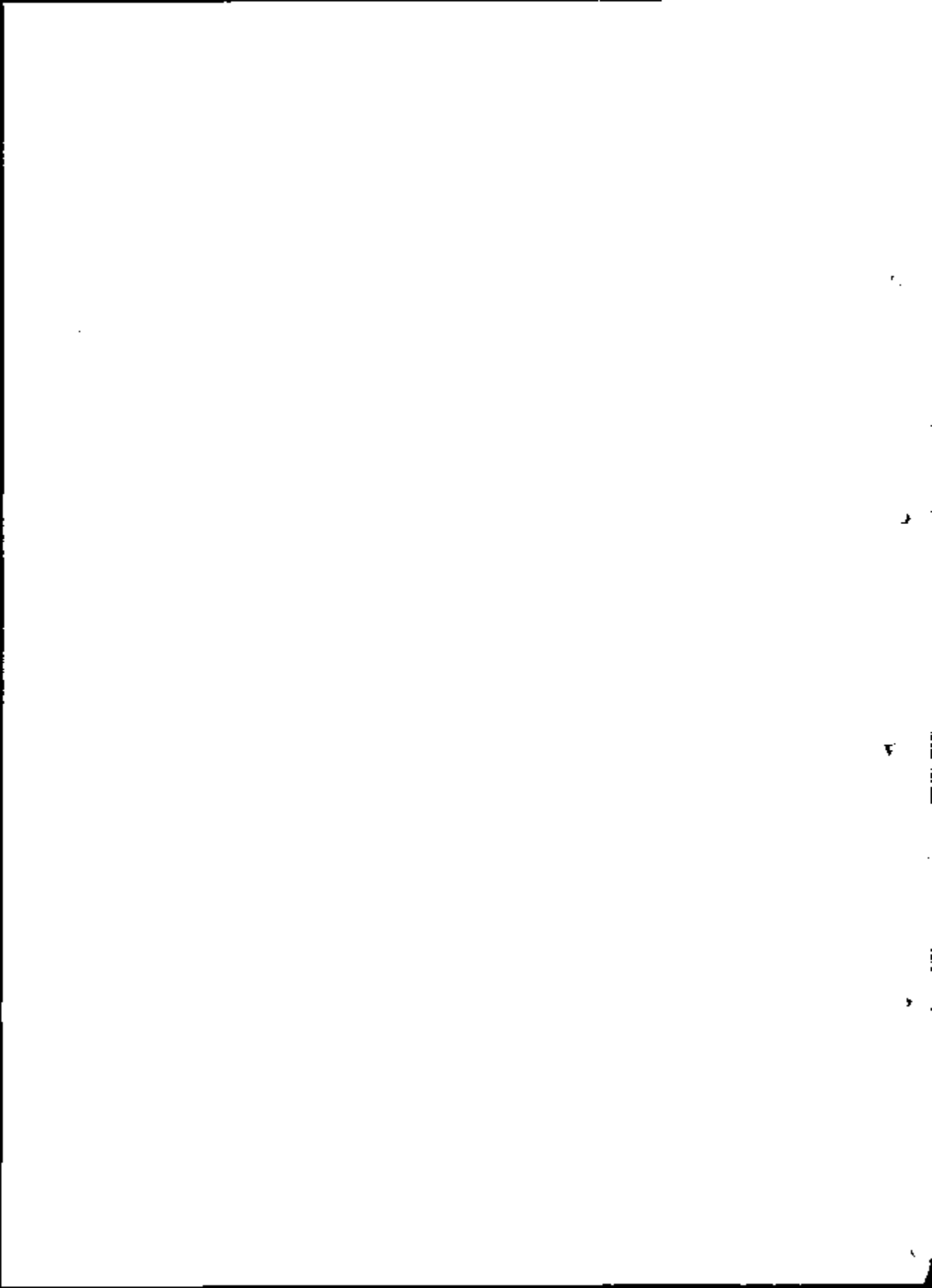
The work included in this thesis was carried out by the author at the Electronics and Communications Engineering Department, Faculty of Engineering, Ain Shams University.

No part of this thesis has been submitted for a degree or qualification at other university or institution.

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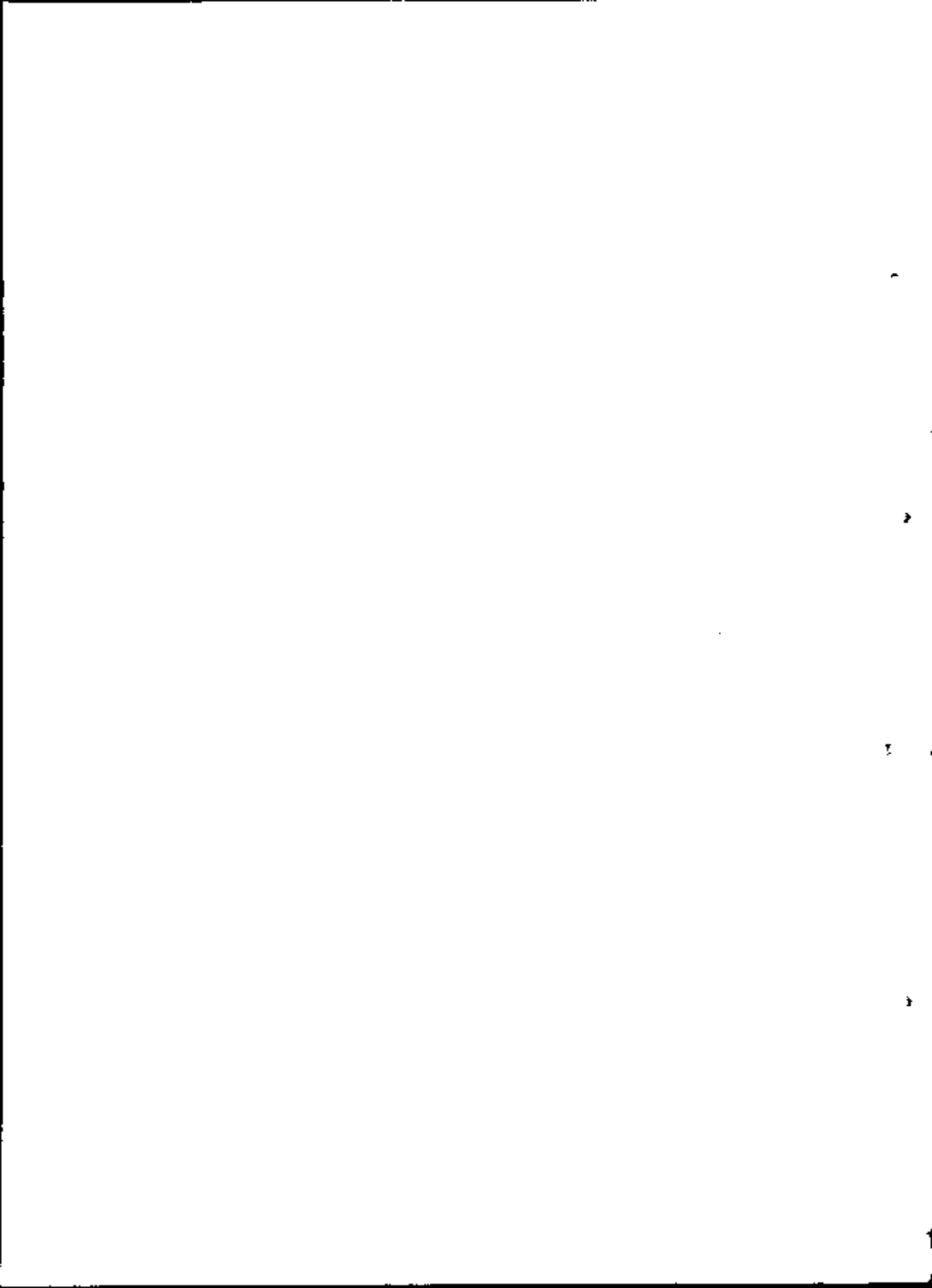
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ABSTRACT

Wael Mohammad Atteya Omar Performance of Automatic Repeat Request (ARQ) Protocols. Master of Science dissertation, Ain Shams University, 2000

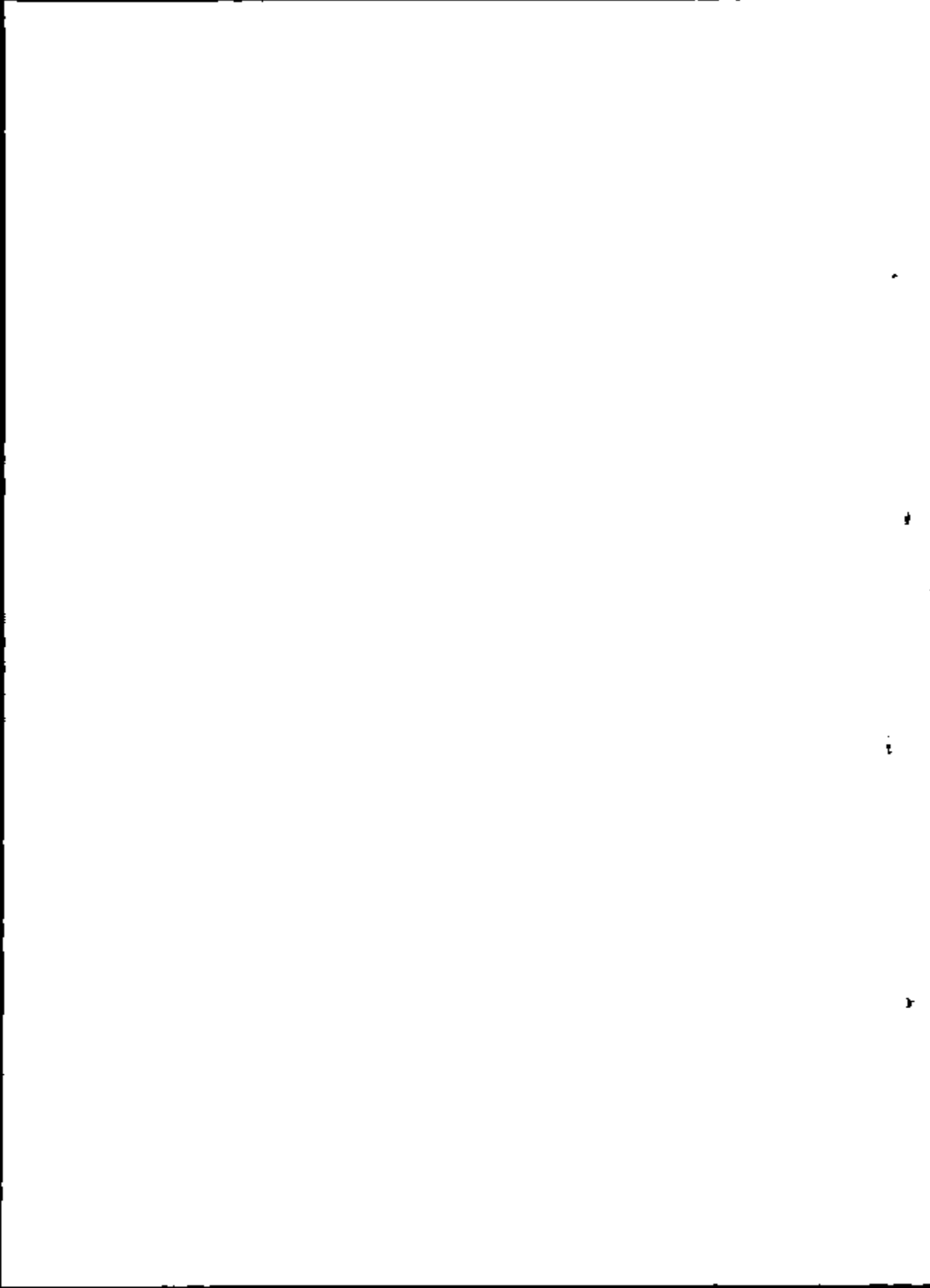
Message Delay, Average Message length and throughput efficiency are the main performance characteristics of a data transmission system with Automatic Repeat Request (ARQ) error control protocol. ARQ is classified into three main different types of schemes.

Those schemes did not consider the system parameters like channel length or channel noise level, which may lead to changes in the level of performance with the change in the system characteristics. In other words, those schemes are independent of the system characteristics that may be changing during operation. In this thesis, a new method is introduced to improve ARQ schemes.

The method tries to establish a dependency between the used scheme and the system characteristics. This method depends on the continuous measuring of some system parameters during operation, then using them to improve the system performance through minimizing the message delay, average message length and throughput efficiency. The main two measured parameters are channel noise level and the round-trip delay that are assumed to be sufficient for the optimization procedure. This new method was applied on SW scheme type as an example. A multi channel system (more than one channel used as a data link) is assumed in our analysis.

The proposed protocol reduces the average message length, the delay and hence, better efficiency is obtained. In addition, the proposed scheme gives better results than that of the ordinary multi channel case.

Keywords: Automatic Repeat Request (ARQ), Stop and Wait, Go back N, Selective repeat.



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