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Expert System for Stability Analysis of Tall Building

By

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A Thesis

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Supervised by

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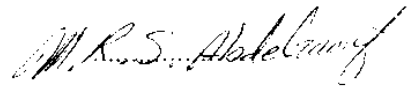
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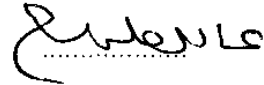
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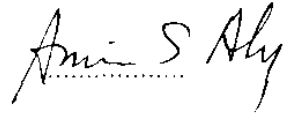
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STATEMENT

This dissertation is submitted to Ain Shams University for the M.Sc. in structural engineering.

The work included in this thesis was carried out by the author in the department of structural engineering - Ain Shams University, from Dec. 1991 to Mar. 1997.

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

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Abstract

The Objective of this thesis is to build an Expert System using the strong programming language called C++. The aim of this Expert System is to study the in-plane stability of multi-story buildings. The program takes into consideration the additional Bending Moments caused by the axial forces acting on the vertical members (columns). This effect known as the P- Δ effect which is important to calculate the actual internal forces.

The program uses the nonlinear method depending on Euler load. It also uses some International Codes such as ACI, BS, and Egyptian Codes in order to get the magnification factors or the additional moments.

This Expert System program tries to simplify the engineer's usage for the codes and hence can compare the results with the theoretical methods.

This program depends on the new approaches in the programming field using Object Oriented method mixed with the Artificial Intelligence and Expert System features. These features simplify the usage, storage and development of the structural analysis' Knowledge.

Keywords

Artificial Intelligence, Knowledge-Based Expert System, Structural Analysis, Civil Engineering, Object-oriented Programming, Ms-Windows programming, C++ programming, Stability Analysis, Plane Frame Analysis, Building codes.

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