WELCOME TO ALADDIN

ALADDIN : A Computational Toolkit for Interactive Engineering Matrix and Finite Element Analysis

Developed By : Mark Austin, Xiaoguang Chen, and Wane-Jang Lin

What is ALADDIN ?

ALADDIN is a computational toolkit for the interactive matrix and finite element analysis of large engineering structures. In ALADDIN, finite element computations are viewed as a specialized form of matrix computations, matrices are viewed as rectangular arrays of physical quantities, and numbers viewed as dimensionless physical quantities.

ALADDIN provides engineers with:

- Mechanisms for the definition of physical quantities with units, and matrices of physical quantities.
- Facilities for physical quantity and matrix arithmetic.
- A SI and US units package. Conversion of units may be applied to physical quantity constants, physical quantity variables, and matrices of physical quantities.
- Facilities for the solution of linear matrix equations, and the general symmetric eigenvalue problem.
- Facilities for the control of flow (i.e. branching and looping) in the solution of matrix and finite element problems.
- Facilities for the definition of two- and three-dimensional finite element meshes.
- A library of finite elements for plane stress/plane strain analysis, two-dimensional beam/column analysis, three-dimensional truss analysis, DKQ plate analysis, and analysis with various shell finite elements.

The target application area for ALADDIN is static and dynamic finite element analysis of multi-story buildings and highway bridge structures. The dynamic analysis of structures due to earthquake loads is of particular interest.

ALADDIN's Problem Solving Capabilities

Here are some examples of ALADDIN in action:

- Quantity Arithmetic
- Matrix Operations
- Matrix Applications :
  - Buckling of a Rod
  - Vibration of a Cantilever Beam

- Linear Finite Element Applications :
  - Analysis of Five Story Moment Resistant Frame
  - Three Dimensional Analysis of Highway Bridge
- Non-Linear Finite Element Applications :
  - Cantilever Beam subjected to Tip Load
  - Rectangular Plate subjected to Uniaxial Loading

For more details about the previous examples download the ALADDIN Technical Research Report.

On-Line Reports and Documentation

- View Table of contents: ALADDIN Technical Research Report
- ALADDIN REPORT: overview (not available yet)
- Download ALADDIN Technical Research Report (1.4MB)
- Download "Study and Implementation of Shell Finite Element for Project ALADDIN" (369K)

ALADDIN Source Code

- The C source code (227K)

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