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KEY WORD: FINITE ELEMENT

SUPATPONG SIKKHABANDIT : ADAPTIVE FINITE ELEMENT TECHNIQUE FOR
VISCOUS FLOW ANALYSIS. THESIS ADVISOR : PROF. DR. PRAMOTE
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The objectives of this thesis are to improve the solution accuracy and the computational efficiency for the viscous flow analysis by using the finite element method. The adaptive meshing technique is also applied to reduce the computational time required.

The finite element equations for viscous fluid flow were derived. Corresponding computer program was developed. Improved computer memory management was implemented to minimize the computer memory and computational time.

In addition, the adaptive meshing technique was used to improve the flow solution accuracy. The technique generates small elements in the region of high solution gradients, and at the same time, uses larger elements in the other regions.

Flow solutions obtained from several problems in this thesis demonstrate the capability of the combined finite element method and the adaptive meshing technique to reduce flow analysis difficulty on personal computers with limited memory:

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