Boundary Element Method

Jeng-Tzong Chen and Hong-Ki Hong

Department of Civil Engineering, National Taiwan University,Taipei,Taiwan

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Textbook

1. Textbook
J.T. Chen and H.K. Hong
Boundary Element Method , Second Edition, (in Chinese).
Taipei Publ., Taipei, Taiwan, R.O.C, 1992, 509pp.

This book gives a compact and unified potential theory of boundary element methods in selected analysis, Laplace equation and crack problem. The hypersingular integral formulation is emphasized to treat the degenerate boundary value problems, e.g., Darcy flow around a cutoff wall and crack problem in elasticity. The dual integral equations are derived and the dual boundary element method(DBEM) is implemented. It consists of nine chapters. Chapter 0 gives a literature review and introduction. Chapter 1 is concerned with the associated mathematical preliminaries. Chapter 2 is devoted to the computational algorithm of discretization of integral equations. The applications of the dual integral formulation in Laplace equation and crack problem are presented in chapter 3 and 4, respectively. The integral representations of J_2 flow elastoplasticity is derived from the rate equation model in chapter 5. Chapter 6 discusses the mechanism of the fictitiuos eigenvalues of the integral formulation of Helmholtz equation. Chapter 7 derives a unified integral solution of the time dependent boundary condition problems and applied to the earthquake engineering. Chapter 8 contains the comparison of BEM and FEM and discusses the coupling use. Chapter 9 summarizes a short conclusion. The references contain three parts, thesis in Taiwan, papers and textbooks.