

Principal Engineer

Expertise Coupled processes (Fluid, Thermal, Creep, Mechanical), Numerical Methods, Constitutive Models

Education Ph.D. (Civil Engineering), 1985
M.S.C.E. (Civil Engineering), 1980
University of Minnesota, USA

Ingénieur Géologue, 1976
University of Liège, Belgium

Professional Experience

2010 – Present	ITASCA Minneapolis Principal Engineer
1993 – Present	Geotechnical Engineer
1990 – 1991	Project Engineer
1986	Consultant
1984	ACRI, Los Angeles, California Consultant
1982	University of Minnesota, Department of Civil and Mineral Engineering Teaching Assistant
1981	University of Liège, Department of Geologie de l'ingénieur, Belgium Consultant
1977 – 1981	University of Minnesota, Department of Civil and Mineral Engineering Research Assistant
1976 – 1977	University of Liège, Department of Applied Mathematics, Belgium Research Assistant

Project Experience

Civil Engineering

Projects have included the study of valley convergence after high dam impoundment (China), geomechanical and flow modeling for Paradox Valley Unit, stability of the Awirs fly ash fill (Belgium), stability analysis of Lyulyakovitza tailings dam, application of a constitutive model for multi-jointed material to rock mass engineering, continuum/discrete numerical simulation of columnar basalt in large-scale underground excavations, back-analysis of an embankment constructed on soft soil using the Cysoil Model, numerical investigation of flow regimes in fractured rock slopes, factor of safety measure for Hoek-Brown material, guidelines for groundwater modeling in large open pit mine design, coupled flow and geomechanical simulation of gas production from coal seams, modeling shock and detonation waves with *FLAC*, installation of a triple anchored excavation wall in sand using the Cysoil Model, stability of a slope in unsaturated conditions, numerical modeling of ground freezing for sub-surface construction, wetting-induced

deformation of geosynthetic reinforced slopes with expansive soils, and evaluation of surface subsidence caused by underground excavation.

Code Development

Lattice Method — Contribution to the development of the *HF* simulator.

Finite Difference — Development in implementation of: two-phase flow logic and pile structural element in *FLAC*; fluid flow and thermal modules in *FLAC3D*; and coupled fluid-thermo-mechanical logic, creep and viscoelastic constitutive models and artificial viscosity damping in *FLAC* and *FLAC3D*.

Analytic Element Method — Development of a computer code to model a regional aquifer using the analytic element method (LEGIA); code development related to front tracking, computation of travel time, modeling of flow in a permeable fissure media; and analytical derivation of linear and circular element to model groundwater flow.

Semi-Analytical Method — Development of a non-iterative semi-analytical method to solve a class of two-dimensional flow problems involving free surfaces (such as phreatic surfaces, interface between fresh and salt water, and seepage face; development of computer codes for the numerical and analytical solutions to problems of leakage from a pond.

Finite Element Method — Development and implementation of a finite element procedure of model fluid flow with free surfaces, using a fixed grid.