

University of New Brunswick

DEPARTMENT OF MATHEMATICS & STATISTICS

NOTICE OF SEMINAR

Dr. Harold Boley

will speak on

**Some Principles of Programming with
Functions and Relations**

Tuesday, March 10, 2009 – 3:30 PM

Tilley Hall 404

ABSTRACT

Functional Programming (FP) and Logic Programming (LP) are the most well-known styles of Declarative Programming, where values (FP) and variable bindings (LP) are computed from executable mathematical-logical specifications. These paradigms allow easier analysis, transformation, verification, and maintenance of programs. The following principles of FP, LP, and their combination to Functional-Logic Programming (FLP) will be discussed:

- * Directionality/Non-Directionality of FP/LP computation
- * Encapsulation of declarative operation combinations
- * Generate-Test separation/integration in FP/LP
- * List-Universality as complex declarative datatype
- * Invertibility via multiple/single definitions in FP/LP
- * Nesting-Conjunction correspondence of properties
- * Unification to equate, analyze, refine data in LP (FP)
- * Amalgamation and Integration of function & relations

Through functional-logic integration, functions and relations can inherit each other's expressiveness; e.g., in FLP certain functions - even when mapping from ground (variablefree) lists to ground lists - can be more easily defined using intermediate non-ground lists (generally, partial data structures), as pioneered by relation definitions in LP.

Dr. Boley is Leader of the Semantic Web Laboratory at the Institute for Information Technology of the National Research Council Canada and Adjunct Professor at UNB's Faculty of Computer Science.