Programming Framework: A Universal Methodology for Process Visualization and Experimental Validation

Gary Welz

Retired Faculty Member

John Jay College, CUNY (Department of Mathematics and Computer Science)

Borough of Manhattan Community College, CUNY

CUNY Graduate Center (New Media Lab)

Email: gwelz@jjay.cuny.edu

Abstract

We present the Programming Framework, a universal methodology for visualizing and analyzing complex processes across multiple disciplines using standardized color-coded flowcharts. The framework employs a five-category color system that enables consistent representation of processes ranging from chemical reactions to mathematical algorithms. We demonstrate the framework's effectiveness through a comprehensive experimental validation using catalytic hydrogenation reactions, showing that framework-guided optimization leads to 15-30% improvement in reaction yields compared to traditional approaches. The methodology provides a systematic approach to process analysis that transcends disciplinary boundaries and enables cross-field comparison and optimization.