

# High Speed Financial/Business Calculations via GPU processors

## Problem Statement

As Dodd-Frank legislation mandates unfold and the importance of risk management and controls continues to increase, financial firms and units require greater and greater calculation capabilities. In some cases, these necessary and required calculations can benefit from strict parallelization that can be implemented by graphical processing units (GPU's). Certain processing techniques can yield a 200-500 times improvement in calculation speed. In support of such efforts, CIG offers specific products, services, and core competencies to address these needs.

## Products Offered

- GPU based Financial Calculation Library
- Price, Yield, Duration, Option and Cash Flow Functions
- Scenario analysis functions
- 40+ subroutines in library and growing
- Full Documentation
- Available in Object (LIB/DLL) or Source

## Services Offered

- Selection of GPU devices,
- Installation and setup of GPU devices and drivers
- Setup of Development/Coding in a variety of languages (C/C++, C#, Java, etc.)
- Customized coding to meet client requirements including Service Oriented Architecture (SOA)
- Testing and Benchmarking, GPU vs. CPU, with problem specific optimization

## Benefits via the Approach

Benefits via the Approach include:

- 200-500 times improvement in calculation speed
- For example, a 5 hour calculation job would be completed in a minute
- Enables real-time credit and market risk calculations
- Enables real-time scenario analysis

## Critical Factors for Deployment

Critical factors for successful deployment include large volume, many scenarios, or any large scale parallelizable problem. Speed improvements through GPU processing require large array or matrix problems.

## Computer Intelligence Group, Inc.

Computer Intelligence Group specializes in providing management and information systems consulting to the financial services community. We have many years of experience addressing the technology and quantitative needs of international/domestic banks, primary dealers and security firms. Our focus is servicing the increasingly complex requirements faced by the banking and securities industry. We believe that the unique needs of these markets can only be fully met by a firm wholly dedicated to understanding the full scope of their requirements.

## Functional Areas

A partial list of Relevant Functional areas includes:

- Risk Management/Compliance
- Credit Risk
- Scenario Analysis
- Fixed Income / MBS Securities
- Derivatives (Listed and OTC)
- Front, Middle office processing
- High End Accounting Functions