# PRESENTATION OUTLINE: — Using GPU to Improve GP Stock Trading Strategy Creation —

Dave McKenney School of Computer Science Carleton University Ottawa, Canada K1S 5B6 dmckenne@connect.carleton.ca

November 22, 2010

#### **1** Presentation Outline

• Explain contents and flow of prsentation

#### 2 Intro to Technical Analysis Stock Trading

- Explanation of what technical analysis is
- Technical Indicators (moving averages, volume indexes, etc.)
- Buy and Sell Signals

#### 3 Outline of GP Approach

- Extra-brief intro to GP?
- Terminals/functions used
- Explanation of trees
- Fitness calculation

# 4 Benefits of GP on GPU for this Problem

- Its faster!
- Can evaluate more individuals, over more fitness cases, in the same amount of time.
- This generally leads to higher fitness values
- High number of fitness cases are needed to overcome over-fitting (problem described in paper x)

## 5 Implementation Details

- The GP engine (lilgp)
- Modifying the evaluation to use GPU
- Converting individuals to reverse polish notation
- The stack based interpreter
- Different layouts of work on GPU (to test the fastest method)

## 6 Speed Comparison

- Sequential approach (nearly an hour to evaluate generation 50)
- Different GPU methods (much faster)
- A few graphs detailing the performance differences.
- Possible reasons for speed differences in different GPU evaluation

## 7 Profitability

- Compare fitness results using a low number of stocks/low number of training days vs. high number of stocks/high number of trading days
- Compare profitability on testing data from outside of training data (do the resulting strategies apply over time, or are they time specific)
- Compare profitability of testing data of for different stocks over same time period (if the resulting strategies are only applicable over time, are the also only applicable over the stocks you trained on) and different stocks outside of training time period (if resulting strategies are effective outside of training data, are they only effective on the stocks you trained on or can they be applied elsewhere)
- In general, is there a way to produce stock trading strategies that are effective over long periods of time and a large variety of stocks (possibly by increasing the number of stocks and the training data size)
- If this is true, is shows the great advantage of GP on GPU as more stocks and fitness cases can be tested much faster

## 8 Conclusion

• Wrapup