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# Introduction

# Senior technical lead with strong front office communications skills in the automated / algorithmic trading environment. Partner in ground-up, proprietary algo trading group with full life cycle view into trading space including latency monitoring, start up to post trade service provider. Looking to leverage experience and interest in the algorithmic trading environment and join a hardworking, execution oriented outfit.

# Technical Summary

# Technical experience includes:

# Programming Language: Core java

# Messaging: HornetQ, FIX, Tibco RV, pure sockets

* **Database**: MySql, Oracle
* **Tools**: QuickFIXj, FIX engine, JProfiler, WireShark, Git, SVN, CVS, IntelliJ, Jenkins
* **Operating Systems**: Windows, UNIX (Linux)

# Experience

**08/2015 – current Refinitiv (Formally REDI Technologies) New York/**

REDI provides an execution management platform to 5,000 users allowing them access to more than 175 execution brokers routing Equities, Futures or Options orders globally, as well as over 20 prime and clearing brokers. REDI is a subsidiary of Refinitiv a global provider of financial markets data and infrastructure with $6bn in revenues with more than 40,000 client companies in 190 countries.

**10/2018 – current Head of Algorithmic Trading, Trading Technology Group**

With the incorporation of Refinitiv several vertical silos were formed within the Trading Technology group. Some silos more established and defined while other were formed with anticipation of growth in their respective areas.

Algorithmic Trading is one of those newly formed silo and as such it was entrusted in me to build it as I see fit.

Building the silo includes the following paths:

* Building and managing the relationships with product and proposition teams, resulting in a clearer view into client needs and the alignment of development effort to grow our revenues in the algo trading space.
* Assess existing technology portfolio within Trading Technology to leverage existing development efforts where synergies exist.
* Evaluate opportunities to expand algorithmic offering to new business lines, such as FX and Fixed Income
* Provide guidance for the development of new algos,  serve as SME for approaches to US market microstructures

**08/2015 – 10/2018 Pair Trading Team Lead (as of 05/2017)**

Developed pair trading algorithms that leverage perceived correlation in price movement between a pair of exchange traded products with highly configurable signal calculation and trading behavior allowing traders maximum control over their execution strategy.

The system is modeled after the Actor Pattern. Each component within the system is a fully encapsulated piece of functionality that communicates with the other components via messaging bus. The system consists of several types of components:

Bridge Components – provide links to market data, fix engines, GUI commands, etc.

Processing Components – core financial functionality such as the algo, order manager, etc.

Monitoring Components – monitoring, logging and alerting of key system activity: ex. stale market data detector, stale orders detector.

As team lead was responsible for algorithm development and developer management

Responsibilities includes:

* Technical & team lead:
  + Finalized product requirement with product and proposition owner.
  + Managed development team pipeline and provided design guidance.
  + Execution of full development pipeline including test, verification, and implementation tasks.
  + Provide support and at times educate QA engineers to allow for better and more valid testing suite both to newly implemented features as well as regression testing
* Releases planning:
  + In coordination with product teams defined release scope.
  + Estimated development efforts for each release based on the agreed upon scope and complexity of included features.
  + Coordinated dependency management between delivery teams ensuring coordinated deployments to ensure successful deployments.
* Production support
  + Educated operations and client relations teams allowing them to provide our clients top level of support.
  + Supported customer’s L3 inquiries, typically issues involving the investigation of executions (or lack thereof) questioned by client.
  + Scheduling, monitoring, and verifying Production deployments.

**02/2013 – 06/2015 Morgan Stanley New York**

Senior software engineer with Morgan Stanley’s global automated trading systems team. Work involved close interaction with multiple group sometime with orthogonal objectives within the organization such as traders, strats and compliance in an effort to minimize exposure due to trading options so to ensure checks and balances are in place for the automated flow.

Responsibilities included:

* Design, implement, test, deploy and support an automated delta hedging process.
  + Process handles hedging requests from multiple upstream processes resulting from multiple traders’ options trading activity.
  + Process incorporate several algos that allow for different methodologies for equities trading based on trader’s configuration.
  + Upon trading instruction arrival, the process forks out the request to the configured algo, calculates the trader’s aggregated open exposure and attempts to trade out of that exposure striking a balance between the need to flatten out the exposure and minimizing costs of executions.
* Redesign and enhance existing systems in lieu of changing requirements. This includes but not limited to additional checks and balances, and new regulatory requirements from compliance department.
* Design and implementation of the first phase of back testing framework that utilizes archived data from different locations within the organization. The framework had two modes of execution.
  + Back testing mode – By extending the API of this mode, the user can connect their tested algo to historical market data, execution data, etc. and analyze the results under historical conditions.
  + “Live” mode –Provide a solution to our QA environment limitation. Relaying on live US market data alone creates great difficulty for team members overseas that implement functionality for the NY trading desks. This mode allows users to set historical data as “live” continuous feeds to the application and thus allowing it to operate outside of normal trading hours.

**09/2011 – 12/2012 Monk Castle Trading, an Equitec Group Subsidiary Chicago**

Proprietary trading firm that designs automated trading strategies in the US equity markets. The desk specializes in high frequency algorithmic trading that leverages micro market signals and transaction costs to generate alpha.

**Senior Software engineer (part of founding group)**

Assumed all development, system administration, and production support related responsibilities to meet a predefined ramp up schedule of 5 months from inception to production on a team that consisted of two other traders

Key Drivers:

Trader based requirement set

Rapid development of data acquisition capabilities due to a need for data for current market strategy analysis

Tight schedule from inception to production

Well encapsulated components for maximum flexibility

Modular design to allow for development and testing to be run concurrently

Performance focused design

Responsibilities included:

* Architecture of the trading application based on requirements provided by the traders  
  The architectural phase included the following stages:
  + Selections of hardware and 3rd party vendor components (such as FIX engine and messaging bus) to best satisfy both our technical requirements, tight schedule and low budget.
  + Software design of each component within the trading application to achieve desirable speed from tick data to order out through the FIX engine.
* Development phase:  
  The following are the various components of the system in chronological order in which they were built.
  + **Market Data Component**:   
    Data provided by Lime Brokerage through their Citrix infrastructure. Market data component has dual functionality. Data acquisition as well as book building capabilities. This component publishes both the raw bids and offers and the calculated top of book events based on configuration.
  + **Application framework**:   
    Implementation of the messaging bus based on HornetQ and various datastores such as the Security Master, messaging events (BestBidEvent, BestOfferEvent, OrderEvent, etc.) and utility classes to be used throughout the application.
  + **Order Manager Service Component**:   
    Design and implementation of a full OMS including state changes based on market responses. The OMS follows the state design pattern where each state assigned to an order indicates the current state of the order as well as the next possible states. The OMS also persisted executions to a database table for further analysis.
  + **FIX Engine Component**:   
    For expediency and cost reasons I chose to implement QuickFIXj FIX engine product. The implementation included support of several FIX sessions and routing of orders to the correct session based on the selected route.
  + **Algo Container Component**:  
    The design of the container allowed for both rapid implementation of new logics and ease of creation through configuration of new instances of existing logics (managed solely by traders). On any given day, each trading server would typically run about 300 algos trading about 200 symbols from 5 different market data sources throughout the day.
* Deployment and testing phase  
  This phase which was running concurrently with the second part of the development phase consisted of:
  + System administrative tasks of building the trading servers (Linux CentOS 6.2 based) such as deployment of MySQL server and to allow for remote access to it through Linux firewall, as well as setting up groups, users, and permissions structure to support the team’s requirements, etc.
  + Creating scripts for starting, stopping and administration of the application via crontab.
  + Adjusting JVN setting to allow for better performance by tweaking the garbage collection method and its parameters to reduce the frequency of “stop the world” cycles.
  + Use of JProfiler to profile the efficiency of the application.
  + Use of WireShark to analyze raw data captured using unix tcpdump tool.
* Production support and enhancements  
  Once the system was put into production a typical day would consist of the following tasks:
  + Monitor the health of the system by monitoring various markers and alerts built into the system.
  + Assist the traders with troubleshooting suspicious activities – such as orders that may or may not have been submitted to the markets or suspiciously cancelled either by the algo or by the markets.
  + Work with the traders on designs of new logics to be implemented within the algo container.

**01/2010 – 09/2011 FTEN a NASDAQ OMX Company New York**

FTEN, a NASDAQ OMX company, offers real-time, cross-market risk management solutions that provide market participants with transparency and control over their global trading activity.

**Product Manager**

As a product manager my responsibilities consisted of both internal facing tasks such as working with the development team as well as external facing tasks of enhancing the company’s product offering to new markets and new asset classes, while supporting our existing clients in meeting new regulatory and compliance requirements as market rules change.

Responsibilities included:

* Expansion of our core business to Canada, including procuring space in data centers, signing contracts with remote hands providers, handling market data vendor of record agreements
* Designed our market data offering, redundancy network connectivity to data centers in the US and drove the development of Canadian markets specific reports.
* Helped create the initial options and future risk checks to comply with 15c3-5.
* Devised symbology handling mechanism amongst the European markets to help calculate a consolidated risk view of multiple venue trading activities.

**05/2009 – 12/2009 Citi – eTrading Technology New York**

Responsible for connectivity infrastructure to Market Data and Liquidity providers. Work included usage of TransactTools FIX engine and GemFire caching.

* Abstraction of database and migration of activity to in memory using caching.
* Analysis and redesign of dataflow across internal and vendor system – reduce hops, vendor count etc.
* Connectivity to Bloomberg’s TOMS and various Citi internal systems

**06/2007 – 03/2009 Trading Metrics, Inc. (Startup – halted operation) New York**

Trading Metrics was a leading player in the space of live latency monitoring focused on the financial industry. Among our clients were large DMA providers and liquidity vendors.

**Senior Software engineer – Team Lead –Analyzer component**

The Analyzer component is responsible for the processing and analysis of network messages’ payload, in FIX or TCP level. The Analyzer would determine transaction cycles, workflow status, and lifecycle of trading activity or staleness of data and generate alert events and general statistics.

Responsibilities include:

* Design of the core structure of the Analyzer. Taking the component from POC stage to production. Result was an increase of processing throughput from 2,000 messages per second to over 10,000 messages a second
* Pre-sale support. Involved in the sales process as the expert on the Analyzer, explaining our methodology and gathering new requirements.
* Delivered client specific implementation through client interaction  
  Meeting with the clients and understanding their specific needs in order to develop a bespoke solution and testing harness that allowed us to display the accuracy of our product.

# Education

**Tel-Aviv University School of Engineering, Israel**

Graduate, Electronics Engineering degree:

**Chosen specialties**: Digital Signal Processing and Communication Engineering

# Military Service \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

# Army Intelligence Corps - Sargent

Served as an instructor in an IT-software unit within the intelligence corps, I.D.F.

# Other \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Eligible to work in the US (Green Card).

Fluent English, Hebrew.

References available upon request.