

PhD in Mathematics & Computer Science

C# Architect-Developer Front Office

Personal Details

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Education

- 2010 **PhD in Mathematics and Computer Science**, University of Lille
Combinatorics and stochastic systems.
- 2008 Holder of the **Agrégation of Mathematics** (the highest teaching diploma in France)
- 2005 **MSc in Mathematics and Computer Science**, University of Paris 7
First class honours, score 16/20, First rank
- 2003 **BSc in Mathematics and Computer Science**, University of Paris 7
First class honours, score 18/20, First rank

Work Experience

March 2013 - Today

BlueCrest Capital Management (London)
C# Architect/Developer Market Data, Technical expert

Technical Context: C#/.Net, Real time, Bloomberg BPIPE, nHibernate, Vertica, SQL Server, WPF/MVVM, multi-clients, multi-servers, high performance multithreading, Active/Active architecture.

Realizations

Phoenix - New Market Data Server (Greenfield). Rewriting from scratch of the Market data server feeding live and historic data to the whole company. About 40 asset classes, 100k+ individual instruments in real time.

- Active/Active architecture, no single point of failure, load ballancing. Ability to deploy within the day without interruption of service.
- Low maintainance, high volume, high availability, highly critical application.

Gateway - Soap Webservice (Greenfield). Offering painless connectivity to all the market data and referential (MDS/Zenith/Phoenix) from variety of heterogeneous technologies (C#/C++/Java/Python...) in all the major data transfer formats (XML, YAML, JSON, CSV).

- Java interface used by Calypso consultants.
- C++ interface used by quant reasearch in London and New York.
- Excel plug-in used in the trader spreadsheets.

- Appreciated for its performance and ease of use by quant research.
- Never failed or crashed in production.

MDS - Market Data Server (Legacy). Stabilization and enhancement of the existing market data system.

- Improved Stability : from 1-2 crashes daily initially to over one year without any major incident.
- Improved Scalability : from 40k instruments with frequent database crashes, to 100k instruments.
- Day to day support and maintenance of a massive (1M lines of code) brittle system.

Zenith - Detailed Referential Database of financial products, calendars, companies (Legacy). Rewriting of the client/server protocol to improve stability. Frequent out of memory issues on large queries solved by implementing data pagination.

February 2011 - March 2013

Société Générale CIB (Paris)

Front Office Developer Forex, Technical expert

Functional Context: Within the Forex Trading Tools team, complete renewal of the Forex trading platform. Order management, Order execution, Market Connectivity, Automatic hedging, Algorithmic trading. Daily volumes of 50 000 orders on average for a total amount of 3.5 billions € on average, six days a week, 24h/24 in a follow the sun fashion.

Technical Context: C#/.Net, Real time, Tibco, nHibernate, Oracle, WPF/MVM, multi-clients, multi-servers massively distributed architecture. High performance multithreading, Socket programming, IOC/AOP, Unit tests, state machines, Pétri nets.

Human Context: Agile development (Scrum), within a multi project team of 15 persons. Frequent meetings: daily meetings, brainstorming, planning games, design reviews, code reviews. Frequent interaction with other teams, support, quality, business. Work under pressure on critical software applications.

Realizations

XSor - Cross-assets Smart Order Router. Rewriting of the price feed component and removal of latency using high performance threading and rethinking of the architecture.

- Design and implementation of a technical solution based on high performance multithreading.
- Dramatic latency reduction on the critical path of order execution to within the millisecond.

OMS - Order Management System (2k man days, Greenfield)

OMS is at the heart of the order management workflow between corporate clients, sales persons and traders all over the world.

- Technical and functional solution proposition.
- Development and conception, both the GUI and the server.
- Modeling of the complex order execution automaton with Petri Nets.
- Automatic STP execution workflows conception and implementation single-handedly (Elected Success Story of the Month by SGCIB Global head of Client and Trading Technology).
- Design and mathematical modeling of the algorithmic order strategy TWAP.

X-Hedge - Cross-assets hedging platform. Hedges 30k client orders a day.

XHedge is a distributed platform made of tenth of servers components of several types scattered across the world and is a host for hedging algorithms provided by the quants.

- Problem statement: each server and each client have to maintain a consistent view of the state of the whole system.
- Theoretical approach to the problem.
- Adaptation of the existing architecture (threading and communication) so as to conform to the hypothesis of the solution.
- Functioning without interruption and with no incident over the last year.

Market Referential (Greenfield) Technical Architect and developer

Providing market connectivity configuration to all the applications developed by the team.

- Technical and software design decision making.
- Modeling of the database schema (products, instruments, markets, clients, market connectivity informations).
- Conception and implementation of a top tier communication framework (AOP remotion, highly reliable and responsive transport layer based on TCP/IP).

October 2005 - June 2010

PhD Student Researcher Fellowship

Computer Science department and Mathematics department - University of Lille

- Optimal mathematical algorithm designing and implementation in C++ and Maple (numerical and symbolic computations).
- Publication of combinatorics and computer science papers in world class journals (written in english).
- Presentation of research works in international conferences (Talks and discussions in english).
- Work both independently as well as with other researchers.

Corresponding Skills : Show scientific rigour. Used to deal with high level mathematics. Strong problem solving skills. Used to use scientific softwares. Ability to turn abstract theoretical models into practical computer programs.

Professor Assistant

University of Lille, Telecom Lille (Engineer school)

- Monitoring and teaching undergraduate students in Mathematics and computer science.
Taught subjects : linear algebra, statistics, probability, calculus, Java programming, compiler theory.

Corresponding Skills : Ability to teach to publics of different levels and backgrounds. A passion for knowledge sharing.