Colin Rafferty

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Brooklyn, NY

Experience

Lyft NYC — New York, NY

Bike and Scooter Firmware (Citibike & BayWheels) *Oct '18 - Sep '24*

A key firmware developer for flagship electric bike. Designed and wrote low-level TCP and HTTP stacks, all high-level communications with the back end, and coordination of running a bike ride. Written in C.

Primary firmware coordinator with business team, working on theft & loss mitigation, new features, and warehouse operations.

Inherited and improved C++ communication stack and controls for first generation scooter and bike. Revised back end controls to move from server control of Ride to scooter (or bike) control of Ride.

Mobile Client Networking (Ride Share) *Sep '17 – Sep '18*

With server team, designed server-side push to mobile clients, and fully implemented on iOS and Android apps in Swift and Kotlin. This reduced mobile network traffic, and reduced latency to see the car's location.

Facebook NY — New York, NY

Mobile Graph Services *May '14 – September '17*

Project Lead and Developer for cross-platform on-device GraphQL query, caching, and pub/sub system. Written in C++ and wrapped in Objective C, Java, and C#, system makes GraphQL server queries, caches tree results in graph database, and updates subscribers with changes found in related queries.

Apollo Server *Jun '13 – May '14*

Co-Lead and Developer for new massively distributed key/value store. Developed novel algorithms for shard splitting and replication within the Raft consensus protocol. Written in C++.

Messenger Infrastructure *May '12 – Jun '13*

Senior Developer for middle tier of Messenger System. Primarily focused on front end proxy tier managing request collation, forwarding, and connection pooling to back end tier. Written in C++.

Two Sigma — New York, NY

Time Series Database *Sep '10 – Apr '12*

Technical lead, designer, and primary developer of Time Series Database system. This is the special-purpose high-speed data distribution network for moving large volumes of structured time series data through the company. Developed on Linux using Java and NIO.

CelFS *Mar '09 – Sep '10*

Primary developer responsible for updating proprietary distributed file system to handle two orders of magnitude more usage. Developed on Linux using Java.

Google NYC — New York, NY

Search Quality *Mar '07 – Mar '09*

Technical lead of date-based web search team. The team is responsible for all date-related scoring and refinements in web search. Projects include improved ranking based on recentness, improving actual document dating based on global text matching, and query refinement by date based on previous user queries. Developed on Linux using C++ with some Python and Java.

Morgan Stanley — New York, NY

NY Head of Electronic Trading Systems *Jan '05 – Mar '07*

Managed a team of nine to provide connectivity, price contribution, trade capture, and inquiry management in B2C markets for Fixed Income cash and credit products. Using Ion Marketview for connectivity, we have a generic Java framework for trade capture, and generic C++ frameworks for price contribution and inquiry management.

Assumed responsibility for the New York office after successfully designing, developing, and deploying the C++/C# inquiry management system that is in use across all cash desks in New York, London, and Tokyo, and was being rolled out to the credit desks globally.

Proprietary Trading Systems *May '03 – Jan '05*

Designed and developed real time P&L system for Fixed Income Proprietary traders that handles trades, positions, and prices for multiple asset classes. Using C++ services on Linux, and a C# front-end, this system integrates across three different cash desks, each with different pricing and position systems.

Credit Derivatives *Jun '01 – May '03*

Rearchitected and stabilized the distributed calculation system for Credit Default Swaps in C++ on Linux and Solaris. This system calculated single-named swaps as well as baskets.

Designed and implemented the replacement for a curve saving system for pricing CDS products on Linux.

Mortgage-Back Securities *Apr '98 – Jun '01*

Refactored a monolithic C++ GUI calculation system into a model/view paradigm. This enabled the implementation of a Perl scripted, overnight risk system that used those C++ model libraries.

Lead architect and developer for real-time pass-thru pricing system in C++ on Solaris. This included using market prices, and calculating theoretical prices as well as inter-product dependent prices to generate Morgan Stanley price.

Merrill Lynch Corporation — New York, NY

Sales Prices Systems *Jun '95 – May '98*

Developer in Price Delivery Group. Designed and implemented system to deliver custom-formatted data feeds to internal and external clients. Data was collected from over one hundred second-party data services, and homogenized through the system. Applications were developed using C++ on a UNIX platform using Sybase databases.

CS First Boston Corporation — New York, NY

Fixed Income Trading Technology *Mar '94 – Jun '95*

Project Leader of Trading System. Led a team of three that designed and developed a system to book trades electronically, maintain trader positions, and perform risk analysis on these positions. Application was developed using C++ with Motif on a UNIX platform using Sybase databases.

Lehman Brothers — New York, NY

Equity Derivative Systems *Feb '93 – Mar '94*

Applications Developer for Traders. Developed OI-based options calculator for static and real-time analysis using C++ with OI libraries on a UNIX platform. Program evaluates various types of exotic options with real-time data, and does sensitivity analysis.

National Broadcasting Company — New York, NY

Barcelona Summer Olympics *Nov '90 – Aug '92*

Creator of Emmy award winning results system. Designed and implemented software to display real-time televised results from various Olympic events. Hired and trained two people to configure and run systems on site at Olympic stadia. Developed software on OS/2 platform in C.

Elections '90 *May '90 – Nov '90*

Software designer of animation control program. Worked with a team to develop software that collects data and controls several different animation and video devices to display graphics for live broadcast. Designed, developed, and implemented a central data and control dispatcher and a mouse-driven user interface. Worked in C with Motif libraries on a UNIX platform.

General Electric Corporate Research and Development — Schenectady, NY

VLSI Design *Sep '89 – May '90*

Software Designer of hardware debugger for digital signal processing chip. Developed requirements, designed, and implemented a graphical debugger for custom DSP chips using C with Sunview libraries on a UNIX platform.

Artificial Intelligence *Sep '88 – Aug '89*

Research Scientist on an intelligent training project. Developed system to teach students to drive cars. Researched various training strategies, developed design of system, and implemnted simulator using C and LISP on a UNIX platform.

Factory Controls *Sep '87 – Aug '88*

Application Engineer on digital real-time control project. Developed a digital control for pulling GaAs crystals. Designed a user interface, a platform interface, and a control algorithm to pull high quality crystals using Pascal on a DOS platform.

Summer Intern *May '86 – Aug '86*

Sole developer for rewrite of nroff-based remote text processing system. Wrote UNIX server and VMS command-line client in C to parse and upload files, remotely process, and download final product. Reduced latency to 10% of local processing time.

Skills

Extensive Experience: C++, Java, Objective C, GraphQL, Distributed Systems, Multithreaded Programming.

Significant Experience: Python, Perl, Sybase, NoSql, React, Linux.

Moderate Experience: C#, Ruby, Javascript.

Education

Carnegie-Mellon University PITTSBURGH, PENNSYLVANIA

Bachelor of Science with Honors in Mathematics and Logic & Computation *1983 – 1987*