

ALAN CAO, Ph.D.

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OBJECTIVE: Seeking a challenging IT/Financial Engineer position in a dynamic institution.

HIGHLIGHTS OF QUALIFICATIONS

- **Technical Skills:**
 - **Platforms:** Windows, Linux, Azure, iOS, Real Time Operating Systems (VxWorks, pSOS)
 - **Programming skills:** Python, C/C++ (embedded C++ to C++20), C#, Visual Basic, Excel/VBA, STL, Boost, .Net Framework, Java, Shell Scripts, Socket Programming, Acrobat Report Generator, SSRS, High Performance Distributed Computation, Software Performance Tuning, System Architecture Design.
 - **Database:** MS SQL, Mongo DB, Kdb+Sybase, MySQL, PostgreSQL.
 - **Web Programming:** React, ASP.net core, PHP, HTML, JavaScript/JQuery/Typescript/Ajax, CSS/Bootstrap, HTTP, REST, IIS, Java Server, Apache.
 - **Data Science/AI/Machine Learning:** SciKit, Numpy, Pandas, Matplotlib, Large market/trading data.
- **Financial Skills:**
 - FX Derivatives Trading, Fixed Income Trading, Portfolio Construction/Optimization, Wealth Management, Mutual Funds, Private Lending.
 - CFA Candidate Level III.
- **Quantitative Skills:**
 - Monte Carlo Simulations, Statistics, Probability, Capital Market Modeling.
- **Project and Team Management Skills:**
 - Managed engineering teams in organizations of all sizes.
 - Extensive experience interfacing with both domestic and international clients.
 - Experience in coordinating efforts from corporate task forces and institutional partners.

PROFESSIONAL EXPERIENCE:

Morgan Stanley/RiskCare New York, NY

Feb 2023 –

Senior Quantitative Developer/Fixed Income Management

- Designed and implemented an automated trade surveillance system across all fixed-income categories, enhancing trading oversight and compliance. (Python, Linux, MSSQL, MongoDB, PostgreSQL, KDB+).
- Conducted in-depth analysis of alert-triggering events, reducing false positives and improving system efficiency. Prototyped a next-generation trade surveillance platform, integrating real-time tracking, market data, historical records, and machine learning techniques. (Python, SciKit, Numpy, Pandas, Matplotlib, Jupyter Notebook SQL, Bloomberg, EVB, ECN, Algorithm Trading)
- Developed a web-based platform to streamline and report workflows for private lending investments, optimizing operational transparency and efficiency. (React, TypeScript, CSS, Bootstrap)

ATC Technology Inc. Rye Brook, NY

Aug 2020 – Oct 2022

Founder

- Developed bioinformatics data processing system for Drosophila and human genetic data analysis. The system is currently under beta testing by research lab (C++, C#, Python).

Alliance Bernstein L.P. White Plains, New York

Apr 2006 – Apr 2020

Team Lead, Development Manager/Wealth Management Group

- Designed and implemented Wealth Forecasting System, a leading investment planning software in the wealth management industry. The system uses parallel computing architecture to perform heavy volume of Monte Carlo simulations based on Bernstein's proprietary mathematical models. Lead the development of capital market data modeling, portfolio performance simulations, investment vehicle implementations, tax calculations, web interface design and statistical analyses (C++, C#, SQL2005, Excel, VBA, Asp.net).
- Lead the development of Instant Advice, an innovative mobile financial planning platform on iPad. (C#, Object C, iOS)

- Lead the migration of the Wealth Forecast System Infrastructure to Azure (C#, Azure, RESTful API, Redis Cache, Azure Batch/Microservices, Docker)
- Daily tasks include new technology research, product design, business analysts interfacing, prototype implementation, project management and junior teammate mentoring.

Morningstar Inc. Chicago, Illinois

Nov 2003 – April 2006

Team Lead/Data Business Unit

- Lead the Data Infra-Structure team. Responsible for Morningstar data production and delivery.
 - Designed and developed the Morningstar global production and data delivery system (XOI) from scratch. System processed over 3 million requests and 30-100 GB data on daily basis. (HTTP, C#, C++, ATL, ASPX, XML, IIS, SQL2000).
 - Developed a proprietary distributed file system for large data-intensive applications. System outperformed Window's file system 3-4 folds in I/O, 50 folds in backup. (C++, C#, COM).

Embedded Internet Solutions, Inc Santa Clara, California

Jul 2000 – Nov 2003

Director of Software Development and Founding Employee

A start-up company providing software solutions in cable systems and wireless devices

- Developed company's first commercial product, the iPanel™ browser core, widely recognized in the industry as the leading embedded browsers due to its small footprint, high performance, fast porting and stable execution. Software was ported to chips from 10+ semiconductor manufactures. (C and C++, TCP/IP Sockets, VxWorks, pSOS, ARM, RISC, x86).
- Product development lead, responsible for all aspects of software architecture, engineering, UI design, QA and customer support
- Devised QA and customer support procedures for all company's software products.
- Interfaced with Board of Directors, CEO, and Marketing VP to discuss company strategy, establish development plans, identify prospective market, and assist in capital raising. Helped grow the company from ground to over 100 employees in a harsh economy.
- Coordinated communication and collaboration between company's US R&D center, China supporting team, and Hong Kong sales office.

UBS, Chicago, Illinois

Jan 1999 – Jun 2000

Software Developer/Foreign Exchange Option Desk

Led the implementation of applications for foreign exchange options trading, pricing, risk management, and front office support

- Participated in the development of OptiX, a global foreign options pricing and trading software. Responsible for the development of the data storage and calculation modules. (C++, COM, MFC, XML)
- Supported front office applications for FX option trading desk, covered pricing, settlement and transaction tracking software. (Visual Basic, C++, Sybase).

National Center for Supercomputing Applications (NCSA), Champaign, Illinois

Feb 1998 – Jan 1999

Research Assistant/Software Development Group

- Developed a Java-based (Applet, JNI, Java Beans) web application for the National Radiation Commission to model radiation decommissioning output.

HONORS AND ACTIVITIES:

- President Volunteer Service Award 2021, 2022
- Reach Award for IT Excellence, Alliance Bernstein, 2007, 2014
- Employer of the year, Embedded Internet Solutions, 2002
- Best Presentation Award, 11th NIH CMB Symposium, UIUC, 1998

EDUCATION:

- **University of Illinois at Urbana Champaign**
PhD in Molecular Bioinformatics
- **University of Illinois at Urbana Champaign**
M.S. in Computer Science
- **Peking University** Beijing, China
B.S. in Biochemistry

TRAINING PROGRAMS AND DESIGNATIONS:

- Certified Financial Analyst Candidate, Level III
- UBS Warburg Graduation Training Program
- Six Sigma Green Belt