CHANDRA BHAN SINGH

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EDUCATION

UCLA ANDERSON SCHOOL OF MANAGEMENT — Los Angeles, CA
Master of Financial Engineering — Dec 2015

NIT, ROURKELA — Rourkela, India
Bachelor of Technology, Civil Engineering — May 2005

EXPERIENCE

Sabbatical break from work parenting — Nov 2021 - Current

- Online Learnings/Projects - https://chandrabsingh.github.io/learnings/

Bank of America Merrill Lynch — Jersey City, NJ
Quantitative Manager - VP - CCR Analytics - Model Performance — Apr 2021 - Nov 2021

- Lead a team of 6 individuals, for quarterly ongoing monitoring review on CCR backtesting processes, with emphasis on process automation front-to-back and resolve SIAI with code release into production
- Monitor results of counterparty credit risk backtesting framework for risk factor, hypothetical trade, hypothetical portfolio backtesting across OTC, LFO and RST traded product portfolios
- Designed and implemented productionization of risk factor and real trade backtesting process to achieve SIAI audit compliance
- Technologies used - Python, Sybase SQL, Jupyter Notebook, Tableau, JSON, SAS, Git, BofA in-house tools

Quantitative Analyst - VP - Market Risk Analytics - Model Performance — Dec 2020 - Mar 2021

- Architected and implemented core solution to move from quarterly reporting cycle to continuous monitoring cycle
- Implemented time series sourcing for PCA IR Vega and PCA IR Delta to capture the interest rate vega and delta sensitivities of bank's interest rate positions and monitor the model predictably using the RMSE
- Technologies used - Python, Sybase SQL, Jupyter Notebook, R, Git, BofA in-house tools

Quantitative Analyst - VP - IRC CRM - Model Performance (Model Developer) — Apr 2019 - Nov 2020

- Lead a team of 3 individuals, with development, documentation, integration and submission of GRA Quartz calibration system for IRCCRM model Diamond Link
- Full automation of IRCCRM calibration process, allowing a 20 business day process to be performed in 90 minutes, supported analysis and requests for MRM validation, follow up questionnaires and resolved RAI submission
- Identified GDA solutions for deprecated Credit IRTK APIs with QSG and Credit tech team assistance
- Assisted CCRA-Q to develop their credit calibration solution using IRCCRM calibration solution
- Spread diffusion: Developed calibration solution to capture the historical spread evolution behavior using credit curve population, hazard rates and curve quotes for single name CDS matrix, by calculating the principal components(PCA) capturing the term structure of single name credit curves and correlation between sector/region pair and volatilities within each sector/region pair
- Ratings Migration/ Jump transition: Developed calibration solution to capture the jump size distribution and the probability of a jump, by calculating the matrix of transition probabilities and the resulting jump sizes for the credit population
- FX: Developed calibration solution to calculate Cholesky decomposition of covariance matrix to capture the volatilities and correlations observed historically for FX pairs
- Base Correlation: Developed calibration solution to calculate historical base correlation skews by performing principal component on the historical time series
- Index CDS Basis: Developed calibration solution to capture the effect of index basis risk, performed linear regression of index multiplier increments on the level; analyzed historical data to determine correlations with overall spread level of portfolio using unadjusted index expected loss as proxy for the overall spread level of portfolio; analyzed correlation between index multipliers of different indices by performing common PCA
- Index Option Volatility: Developed calibration solution to capture the risk factors for credit correlation books, using the volatility surface; calculated logarithm of the implied volatility for the combination of shifted strike level and expiry; calculated the correlations between the monthly log increments of the index expected loss and of the implied volatilities; analyzed correlation log-increments of different indices by performing common PCA

- Recovery at Default: Developed calibration solution to capture the uncertainty of recovery by calculating the shape parameters of beta distribution for each sector and seniority, using Moody's Default and Recovery Database.
- Technologies used - Python, Sybase SQL, MS SQL, C#, VBA, Java, C++, VSS, BofA in-house tools

Quantitative Analyst - AVP - CCR Analytics - Model Performance Apr 2016 - Mar 2019

- Development, execution, result generation and analysis of counterparty credit risk backtesting framework on Credit Studio and Quartz by risk factor, trade and portfolio level for Bankwide and Real counterparty portfolios, by different risk factors category and by collateralized and uncollateralized exposure for different asset classes as set by the Basel Committee for Internal Model Method(IMM)
- Development of convergence path results between simulation with production and reference paths considering materiality of trade volume and effective EPE/RWA distribution for stressed and baseline scenarios
- Development of distributional test statistics testing anomalies, precision and test conservativeness across profile
- Calculation of EEPE metric based on risk parameter calibration using current market data and stressed market scenario
- POC project for User Valuation Override(UVO) backtesting using Quartz QzTable grid presentation by cube aggregation measures, pandas and matplotlib plotting functions
- Data collection - preparation and generation for stressed and baseline quarterly backtesting runs for yield curves, functors, fxrates, volatility, indices from Bloomberg, databases and internal sources
- Working understanding of Global Derivative Analytics(GDA) functors using Credit Studio(Java), Quartz(Python) and excel plugin API
- Working knowledge of hugs distributed API, batch scheduling using bob job API
- Understanding of ISDA SIMM Methodology Version 3.15 – for calculating the initial margin for delta risk, vega risk and curvature risk
- Report writing using latex
- Technologies used - Java, Python, Oracle, C++, VSS, BofA in-house tools

ROW Asset Management New York, NY

Research Analyst - Intern Jun 2015- Aug 2015

- Replicated trading strategy using tick data for intraday reversal in foreign exchange(FX) markets and back tested results, market research paper by Deutsche Bank
- Analyzed trading FX spot using candlesticks patterns and back-tested market research paper by Nomura
- Compared CQG and Bloomberg historical future commodity tick data using SQL and MATLAB for 15 years
- Technologies used - Matlab, SQL, VBA

ION TRADING Delhi, India

Software Developer - XTP Mar 2010- Aug 2014

- Formulated real time, multithreaded, distributed architecture – trading solution in Java, VC++.Net and Oracle
- Designed and implemented interest rate swap (IRS) core library, market plugin and its data structure in MSSQL using dependency injection design pattern, messaging API and event driven architecture
- Developed reversal of back office end-of-day process for position, balance, margin and fee processing using event driven workflow using Java and Oracle – SQL in Agile methodology
- Profiled, benchmarked and back-tested trading engine libraries analyzing object allocations, garbage collection
- Technologies used - Core Java JDK6, Unix, Junit, TestNG, Maven, GIT, VSS, JVM profiling tools, Oracle, ION in-house tools

3i Infotech Hyderabad, India

Senior Software Engineer Sep 2006- Mar 2010

- Researched and built solution to identify and predict fraudulent transactions, based on risk categorization and risk assessment of customer, applying data mining technique using Oracle OLAP multidimensional model
- Analyzed and designed multi-legged trading panel including built-in strategies and support for customized strategies for front office and order management trading system(OMS) and mark-to-market margin calculation for risk management solution(RMS)
- Technologies used - Core Java JDK5, Object Pascal, J2EE, Servlets, EJB, FIX protocols, Shell scripting, VSS, Oracle - OLTP and OLAP, hands on experience of query tuning, memory management and optimizing Oracle query

HINDALCO Industries, Smelter Hirakud, India

Associate Civil Engineer Jun 2005 - Sep 2006

- Estimated project cost, procured raw materials, finalized design specification and management of site logistics