Charles L Blake, charles.l.blake2@gmail.com, 617-448-3172

ACADEMIC	RESEARCH FACULTY, COMPUTER SCIENCE - **Massachusettes Institute of Technology** 1998-2004
	PH.D (ABD) IN PHYSICS - **University of California at San Diego** 9/94
	BACHELOR OF SCIENCE IN PHYSICS - **California Institute of Technology (Caltech)** 6/91

OVERVIEW Broad & deep skillset & experience including risk management & attribution, bottom-to-top high/medium/low-frequency data processing, analysis & trading of equities & options. 11 years experience researching&running quantitative models&trading strategies. 30 years experience in low-level, numerical/statistical/ML programming, big data science & management, distributed systems. Experience managing/supervising research&practice. Collaborative & helpful.

Skills

Strategy Design & Implementation	Portfolio Analysis & Optimization	Algos & Data Structures
Option Pricing & Risk Analysis	Numerical & Statistical Methods	OS & Network Research

Languages

C/ C++	Cython, Nim	Zsh/Bash/sed/awk/etc	Mathematica
Python	HTML/CGI/Javascript	Some FORTRAN, R, Java	Some Matlab, SAS

Platforms   **UNIX** (Linux since 1992; maintained procps early on), *BSD, *nix, Win*

EXPERIENCE

Savoir Faire; Quant Consultant   2/2024-now
- Senior Quantitative Consultant for Long-Short US Equity Hedge Fund

StatusIM; Distributed Storage Consultant   2022-23
- Consulting for crypto-currency incentivized peer-to-peer storage

SESCO, PJM; Energy Market Trading   2021-22
- Nim software consulting for physical simulation of US power grid & data management

Focal Systems; Computer Vision AI Consultant   2019
- Point-of-sale integration of computer vision-based auto-checkout system

Cooper CryptoCurrency Exchange Start-up   2018
- Founding team pitch work, system building/design, dev.env setup, venture meetings

Independent research   2016-2017
- faster LSD radix sort, density/quantile estimation, moving order stats, hashes, scaling LARS

Central Risk Desk - J.P.Morgan   2015
- Research into toxicity and alpha overlay on top of flow; Backtest alpha factors.

PORTFOLIO MANAGER - BlueCrest Capital, LLC   2013-2014
- 800MUSD gross book allocation with good payout formula; Re-create best former notions & new ones with permissive IP retention. Risk & return attribution & analysis over many signals

PORTFOLIO/INVENTORY MANAGER/RESEARCHER;$1B fund - Citigroup 2009-2013
- Managed $1Bx$1B MUSD long-short quant equity portfolio in large US, EU, JP universe.
- Collaborated & Improved Data & Strategy Implementations of self & others
- Design & implementation of ARCA/NASD colocated order book (sub-μs software response)
- 2000X speed-up & generalization of common risk book portfolio optimization strategy
- Built tick and quote farm (IO bw-limited throughput, 10X better than KDB at the time)

QUANTITATIVE STRATEGY RESEARCHER - Millenium/WorldQuant   2007-8
- Developed cross-sectional time series DB and analysis platform. Typical operations below 25 cpu clock cycles per stock per time sample per cpu, including expensive order statistics. Suitable for scalable back-testing, re-sampling & non-linear risk optimization techniques.
- Fully automatic, global long-short equity portfolios based on fundamental, technical & forecast data; realized Sharpe 2.8 (21%/7.5% vol) for '08. Backtest @Sharpe 4 in earlier years.

QUANTITATIVE ANALYST CONSULTANT - Soros Fund Management   2006
- Research, development & back-testing of various promising quantitative portfolio selection and portfolio optimization strategies via statistical models using fundamental and macro data.
- Automated data retrieval, cross-checking & cleaning for a wide variety of data types, styles, and frequencies. Wrote needed data processes for Matlab, SAS, Python & C.

QUANTITATIVE ANALYST - D.E. Shaw   2005
- Investigated infrastructure issues for option market making system.

SR.MODELING&QUANTITATIVE RESEARCHER - Peak6, LLC   2004-2005
- Callback-style custom analysis DB & simulator engine for tick data. 5 min/market year.
- Developed long-short stock pair trading system. Pair selection used many novel cointegration statistics. Manual piloting got 85% winning trades w/median winners making $.30/share.
- Historical event analysis system forecasting vols entering epochs with known higher risk.
- Option pricing numerics lib w/extended greeks, rich div, yield & fwd vol structure, accel.cvg
- Visualization tool for risk-neutral price probability density extracted from options data.
- Built/maintained multi-TB Linux box for OPRA market data record/re-broadcast/analysis.

RESEARCH FACULTY in OSes&Nets - MIT LCS/CSAIL (Publications Below) 6/00 to 1/04
- High-resolution arrival time-based, multi-router congestion sharing & capacity estimation.
- Wrote a fast, flexible database for flow-oriented large-scale packet trace/event analysis.
- Delineation of relevance of routing optimization in reliable distributed hash tables.
- Extensions to traditional percolation models for radio network asymmetry/inhomogeneity to understand potential for asymmetric routing at higher layers. Used real US Census data.
- Explored different sensor coverage models including energy-bounded sensor avoidance paths.
- Fully automatic adaptive probability density estimation (algorithm and command-line tool).
- Analysis of ad hoc wireless network capacity and scalability.

SPONSORED RESEARCH STAFF - MIT-LCS, Parallel & Distributed OS group 1998-2000
- **Supervisor/Collaborator of Student Research**. Projects included:
  - **networking**: DNS traffic analysis, packet filters, DoS attack detection, network file systems.
  - **operating systems**: load forecast-based scheduling, drivers, session migration, secure deletion
- **Individual Researcher**. Unpublished research includes:
  - novel small sample bias adjustment technique for maximum likelihood estimators
  - fast implementation of an exact multinomial distribution equality test
- **Principal Exokernel Maintainer**. Included work on: exokernel file system security, applications of hierarchial capabilities, dynamic packet filters for active network nodes, SMP issues in exokernels, library OS service composition, DARPA quarterly progress reports

DISTRIBUTED SYSTEMS RESEARCHER - (BBN, now Verizon) Cambridge 1997-1998
- Architect, designer, implementator of stateful object replication system for a CORBA ORB.
- Architecture and design work on a collaboration system based on a weak-consistency distributed shared memory with attention to quality of service dynamic adaptation.

SOFTWARE DEVELOPER - Bolt,Beranek&Newman (BBN) San Diego   1994-1997
- Developed a fast, flexible C preprocessor-based macro library for C++ STL-like containers
- Developed a simple workflow system using the CRONUS distributed OS
- Ported the CRONUS development and runtime system to LINUX
- Developed a portable Motif dialog library; learned Motif and Xmt Rapid App Dev
- Administered a network of SUNOS, Solaris, HP-UX machines (NIS, NFS, e-mail, ...)

TEACHING ASSISTANT - UCSD Physics 105   Fall 91, 92, 93;   Spring 92, 93, 94
Computational Physics and Numerical Methods.
Guest-lectured; taught computer lab sessions; grading; solution preparation in C, C++, and Fortran; held office hours for individual consultation. Recommended for a teaching award.

TEACHING ASSISTANT - UCSD Physics 2BL   Winter 93, 94
Held pre-lab lectures, lab sessions, office hours; graded notebooks and exams.

SOFTWARE DEVELOPER - Caltech Physics Dept   Winter, 91
Wrote a nonlinear, errors-in-variables curve fitting and statistical data analysis package in *Mathematica*. Students used for sophisticated analyses of data collected in physics labs.

TEACHING ASSISTANT - Caltech Physics 3 & 4   Spring 90, 91
Freshman & Advanced Freshman Physics Laboratories.

PUBLICATIONS

Sachin Katti, Dina Katabi, Charles Blake, Eddie Kohler, and Jacob Strauss, *MultiQ: Automated Detection of Multiple Bottlenecks Along a Path*, ACM IMC, October, 2004.

Rodrigo Rodrigues, Charles Blake *When Multi-Hop Peer-to-Peer Routing Matters*, International Peer-to-Peer Systems 2004, La Jolla, December 2004.

Charles Blake, Dina Katabi *Cross Traffic: Noise or Data?*, Bandwidth Estimation 2003, San Diego, December 2003.

Charles Blake, Rodrigo Rodrigues, *High Availability, Scalable Storage, Dynamic Peer Networks: Pick Two*, Proceedings of the 9th Workshop on Hot Topics in Operating Systems (HotOS '03), Lihue (Kauai), Hawaii, May 2003.

Charles Blake, Steven Bauer, *Simple and General Statistical Profiling with PCT*, Proceedings of the 2002 USENIX Annual Technical Conference (USENIX '02), Monterey, California, 2002.

Dina Katabi, Charles Blake, *A Note on the Stability Requirements of Adaptive Virtual Queue*, MIT-LCS-TM-626, 2-13-2002

Dina Katabi, Charles Blake, *Inferring Congestion Sharing and Path Characteristics for Packet Inter-arrival times*, MIT TR-828, December 2001.

Jinyang Li, Charles Blake, Douglas S. J. De Couto, Hu Imm Lee, Robert Morris, *Capacity of Ad Hoc Wireless Networks*, Proceedings of the 7th ACM International Conference on Mobile Computing and Networking (MobiCom '01), Rome, Italy, July 2001.