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Rohit Singh

PREFACE: This version of my resume is intended more for industry participants. A longer, more academically-oriented resume with all my publications is available at:
http://people.csail.mit.edu/rsingh/Rohit_Singh_Research_CV.pdf

EDUCATION

2003-2011 **Massachusetts Institute of Technology** *(on non-resident status 2007-2011)* **Cambridge, MA**
Ph.D., Computer Science
- PhD Thesis: Algorithms for Analysis of Protein Interaction Networks.
- Teaching Assistant for 6.867, MIT's main graduate-level course on Machine Learning.

2000-2002 **Stanford University** **Stanford, CA**
M.S., Computer Science (specializing in Artificial Intelligence and Computational Biology)
- MS Thesis: An efficient algorithm for identifying 3-D structural patterns in protein structures.

1996-2000 **Indian Institute of Technology** **Kanpur, India**
B.Tech., Computer Science & Engineering

SELECT HONORS & AWARDS

- George M. Sprowls Award for the Best Ph.D. Theses in Computer Science at MIT (2011).
- Christopher Stephenson Memorial Award for Best Masters Research in Computer Science at Stanford (2002).
- Test of Time Award at RECOMB, one of the two top conferences in computational biology. The award, given in 2019, was in recognition of the impact of my paper presented at RECOMB 2007.
- World Finalist, ACM Programming Contest (represented IIT Kanpur, the only Indian team) (2000).
- Ranked 17th nationwide in the IIT entrance examination (1996).
- In 1996, I was the only student offered admission to the IITs as well as to AIIMS, India's premier medical school.

EXPERIENCE

2019-curr **Massachusetts Institute of Technology** **Boston, MA**
Research Scientist, Computer Science and Artificial Intelligence Lab
- Current research interests are focused on understanding the cellular system by integrative analyses of single-cell data and on modeling protein interactions with small molecules, antibodies and other proteins (please see publications below).
- Plan, prioritize and perform a research program in computational biology.
- Co-supervise graduate students at MIT and collaborate with faculty at Tufts Univ and Harvard Medical School.

2012-2019 **Tech Square Trading** **Boston, MA**
Co-founder, Chief Executive Officer & Portfolio Manager
Tech Square Trading (TST) is a quantitative market-neutral equities fund. The firm traded large and mid-cap equities in US, Europe and Japan. It deployed a collection of strategies, with typical holding periods of 2-5 days. In 2018, the firm had a median daily volume of 1approx. $285 MM.

In May 2019, the co-founders decided to shut down the firm due to working capital constraints.

- Led a high-caliber, collegial team of 4 quantitative and 2 finance/marketing professionals.
- Oversaw all research and trading efforts within the firm, covering ideas from market-microstructure and portfolio construction to machine learning and use of alternative data etc.

- Primary author of the firm's initial codebase, specifically the C++ trading engine and backtest framework. The trading engine had a multi-core, lock-free, shared-memory architecture and proved adaptable and extendable to various markets and trading styles.
- Proficient in each aspect of the firm's technology stack: Linux, Bash scripting, C++, Python (incl. Pandas and Tensorflow) & R.
- As the CEO of this startup fund, became intimately familiar with all aspects of the business including prime-brokerage relationships, research data acquisition, selection of trading venues, technology providers, and data feed licensing etc.
- Led fundraising efforts and pursued a multi-track approach of discussions with platforms, fund-of-funds, smaller institutions and family offices.
- Led the successful negotiation, execution and deployment of a Separately Managed Account.
- Established and nurtured a high-impact internship program. About 30 students, primarily from MIT and Harvard, have interned with the firm. Along with my team-members, I guided the interns' work towards expanding TST's alpha-library. This alpha-library, in turn, enabled a machine learning based systematic capital-allocation framework.

2008-2011 **SAC Capital Advisors, Multiquant Division (now Cubist Systematic)** **New York, NY**
Research Analyst

- Designed, implemented and operated high-frequency and statistical arbitrage strategies.
- As part of the starting team of two, I was co-responsible for building and deploying the initial strategy-set. Over time, we deployed strategies of significant size in US and Europe.
- Performed computational and statistical analysis of large datasets to generate trading signals.

2007-2008 **Merrill Lynch** **New York, NY**
Associate, Global Strategic Risk Group (GSRG is a proprietary trading group within ML)

- As part of a small team, I maintained, monitored and enhanced a family of high-frequency and statistical-arbitrage strategies that traded in U.S., Europe, and Canada.
- Designed and created an analysis and reporting platform for post-trade logs as well as simulations. This was adopted into active use by the broader team.

2003-2007 **Prof. Bonnie Berger's Research Group, MIT** **Cambridge, MA**
Research Assistant

- My research was on modeling proteins and their interactions. I designed computational techniques to clean, augment, analyze, and use experimental data. In the process, I also collaborated with biologists at the Harvard Medical School.

2002-2003 **Accelrys Inc.** **San Diego, CA**
Software Engineer (Bioinformatics Applications Group, Life Sciences R&D Divn.)

- Along with a senior team-member, I led the initial design work for a new version of DS GCG, a bioinformatics application with a multi-million dollar revenue stream.

PATENT

Berger B. and Singh R., *Method for Identifying Network Similarity by Neighborhood Matching*, USPTO # 8000262.
Chefitz A. and Singh R., *Self-administered, non-invasive, transcutaneous viral detector*, US Patent applied (# 17/079,649).

SELECTED PUBLICATIONS

Below, * indicates equal credit

- *Singh R*, Hie B*, Narayan A, Berger B.* Schema: metric learning enables interpretable synthesis of heterogeneous single-cell modalities. Genome Biology (2021).
- *Sledzieski S, Singh R*, Cowen L, Berger B.* D-SCRIPT translates genome to phenome with sequence-based, structure-aware, genome-scale predictions of protein-protein interactions. Cell Systems (2021). Also presented at RECOMB 2021, one of comp bio's top conf

- *Sledzieski S, Singh R*, Cowen L, Berger B.* Adapting protein language models for drug-target interaction prediction. NeurIPS Workshop on Machine Learning in Structural Biology (MLSB, 2022). Under review
- *Wu A*, Singh R*, Berger B.* Granger causal inference on DAGs identifies genomic loci regulating transcription. Int'l Conf on Learning Representations (ICLR, 2022). Under review
- *Kaplow IM*, Singh R*, Friedman A, Bakal C, Perrimon N, Berger B.* RNAiCut: automated detection of significant genes from functional genomic screens. Nature Methods (2009).
- *Liao CS, Lu K, Baym M, Singh R, Berger B.* IsoRankN: spectral methods for global alignment of multiple protein networks. Bioinformatics (2009).
- *Singh R, Xu J, Berger B.* Global alignment of multiple protein interaction networks with application to functional orthology detection. Proc Natl Acad Sci USA (2008).
- *Singh R, Berger B.* Influence Flow: Integrating Pathway-specific RNAi Data with Protein Interaction Networks. Int'l Conference on Intelligent Systems for Molecular Biology (PLoS track, 2007).
- *Singh R, Xu J, Berger B*. Pairwise Global Alignment of Protein Interaction Networks by Matching Neighborhood Topology. Int'l Conference on Research in Comp. Mol. Biol (RECOMB, 2007).

INTERESTS AND COMMUNITY SERVICE

- In Jan 2020 and 2021, taught a course on The Business of Quant Investing, a 4-session course during MIT's IAP term. The course has been received well, with the class size significantly exceeding the initial estimate.
- Enjoy grilling and reading non-fiction and science-fiction.
- Interested in improv comedy—took lessons before the pandemic.