# Rohit Singh

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## Education

**Sep 2003** **Massachusetts Institute of Technology**                                         **Cambridge MA**
**Sep 2011** *Ph.D., Computer Science  (with a minor in Finance from the Sloan School of Management, MIT)*
- **GPA: 4.9/5.0**                **Was on non-resident status during 2007-2011**
- *PhD Thesis*: Algorithms for Analysis of Protein Interaction Networks.
- *Salient courses*: Adv. Algorithms, Theory of Computation, Machine Learning (Teaching Assistant), Computational Functional Genomics, Probabilistic Methods in Biocomputation (Harvard).
- *Coursework at Sloan School of Management*: Finance Theory-1, Options and Futures Pricing.

**Sep 2000** **Stanford University**                                                              **Stanford CA**
**Jun 2002** *M.S. Computer Science (specializing in Artificial Intelligence (AI) and Computational Biology)*
- **GPA:  4.1/4.3**
- *MS Thesis*: An efficient algorithm for identifying 3-D structural patterns in protein structures.
- *Salient courses*: Probabilistic Methods in AI, Machine Learning and Statistical Techniques in AI, Comp. Molecular Biology, Computer Vision, Modeling and Simulation with C++.

**Jul 1996** **Indian Institute of Technology**                                                    **Kanpur, India**
**Jun 2000** *B.Tech.  Computer Science & Engineering*
- **GPA:  9.77/10.0 (=3.91/4.0)**                **Rank in class: 3rd**
- *Salient courses*: Computer Networks, Operating Systems, Compilers, Databases, Programming Languages. Graduate-level courses in CAD, Complexity Theory, and Functional Programming.

## Select Honors and Awards

- Awarded the Christopher Stephenson Memorial Award for Best Masters Research in the Computer Science Department at Stanford University  (2002).
- World Finalist, ACM Programming Contest (represented IIT Kanpur, the only team from India) (2000).
- Ranked 17th out of more than 150,000 candidates in the entrance examination of the IITs (1996).
- First author of the most highly cited RECOMB paper published in the last 5 years. RECOMB is the top conference in computational biology (2007).

## Experience

**May 2008** **SAC Capital Advisors LLC**                                                          **New York NY**
**Sep 2011** *Research Analyst*
- I designed, implemented and operated high-frequency and statistical arbitrage strategies. I performed computational and statistical analysis of large datasets to generate investment hypotheses and create automated trading strategies based on these.
- The skills required for my role include: statistical modeling and analysis of large datasets (using R , S-Plus or Matlab), scripting (in Perl or Python), and design of trading strategies (using C++)

**Sep 2007** **Merrill Lynch**                                                                      **New York NY**
**May 2008** *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 statistical arbitrage strategies that trade in U.S., Europe, and Canada.
- Designed and created an analysis and reporting platform, for post-trade logs as well as simulations. Using it, we gained deeper insight into the strategies I work on and have improved their alpha signal. Other team-members now use it to analyze their strategies.

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

- My research was on modeling proteins and their interactions and computational techniques to clean up, augment, analyze, and use experimental data. My work relies heavily on both algorithmic approaches as well as statistical and machine learning techniques.
- *Collaborations*: I collaborated with a professor at Carnegie Mellon University and with a lab at the Harvard Medical School.

**Jul 2002    Accelrys Inc.**                                                                                     **San Diego CA**
**Jul 2003**   *Software Engineer  (Bioinformatics Applications Group, Life Sciences R&D Divn.)*
- Maintained, refactored, and extended the data-format conversion module shared by all bioinformatics products in the company; the format conversion features of these products were a major competitive advantage.
- 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.

## Skill-Set Summary
- **Programming Languages:** *Proficient* in C/C++, Python, Java, MATLAB, & Shell Scripting. *Fluent* in R, Perl, Javascript, & Fortran. *Familiar* with Ruby, SQL, Lisp, ML, Prolog, & Visual Basic.

## Patent
- *Berger B. and* **Singh R.***,* Method for Identifying Network Similarity by Neighborhood Matching, *USPTO # 8000262*

## Select Publications
**2010**
- **Singh R**, Park D, Xu J, Hosur R, Berger B. Struct2Net: a web service to predict protein-protein interactions using a structure-based approach. *Nucleic Acids Res.* 2010 Jul 1;38

**2009**
- *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 Jul;6(7):476-7
- *Liao CS, Lu K, Baym M,* **Singh R***, Berger B.* IsoRankN: spectral methods for global alignment of multiple protein networks. *Bioinformatics.* 2009 Jun 15;25(12):i253-8.

**2008**
- **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 Sep 2;105(35):12763-8

**2007**
- **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
  ***This paper and its sequels (including the PNAS 2008 paper) have close to 200 citations***

**2006**
- **Singh R***., Xu J., and Berger B.* Struct2Net: Integrating Structure Into Protein-Protein Interaction Prediction. Proceedings of the Pacific Symposium on Biocomputation, 2006.

**2005**
- **Singh R***., Palmer N., Gifford D., Berger B., and Bar-Joseph Z.* An Active Learning Approach to Sampling In Time-Series Experiments. Proceedings of the Int'l Conference on Machine Learning, 2005. Also, a poster on this was presented at the ACM Conference on Research in Computational Molecular Biology, 2005.

## Professional & Community Service
- Elected member of the Computer Science and Artificial Intelligence Lab's Student Committee, the primary student body for graduate students in Computer Science at MIT.
- Designed and taught a 12-week, 3-hours-per-week class on Classical Mechanics for local high school students, as part of MIT's Educational Studies (Outreach) Program (2004).
- Member of the 3-person Executive Committee at IIT Kanpur (2000), which led about 200 students in organizing IIT Kanpur's biggest (till then) student festival, Techkriti.

*References available upon request.*