Aiman Sherani

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SUMMARY

- Strong quantitative background through **5** years research experience in **Biophysics** using **Statistical Modeling**, **Programming (Python)**, and **Machine Learning** to address biological problems that were unsolvable through traditional experimental methods.
- Applied Data Mining and Visualization techniques to parse through data, identify which scoring functions would best address the problem of interest, and weed out irrelevant data.
- Implemented machine-learning methods to reveal trends in large data sets and predict novel solutions.
- Assessed validity of using specific statistical models to the data through ensuring the implicit assumptions of the models held true in our experiment and data.
- Worked collaboratively in large, multidisciplinary research groups with people of different backgrounds.
- Excellent communication skills. Invited presenter at national and international conferences to technical and non-technical audiences

DATA SCIENCE EXPERIENCE

THE UNIVERSITY OF CHICAGO Graduate Researcher | July 2016-June 2018

- Developed advanced computational methodologies to characterize the binding specificity of protein complexes.
- Incorporated both **statistics based models** (i.e. Mutual Information, Regression, Entropy) from sequence analysis of the potential protein—protein complexes and **physics based models** (i.e. free energy calculations) to differentiate between cognate and noncognate interactions.

WELLESLEY COLLEGE Undergraduate Researcher | September 2013 – May 2015

- Computed the electrostatic binding free energy computationally utilizing numerical methods to evaluate the role of physical characteristics of proteins in determining their ability to bind specifically or promiscuously.
- Used **data mining** and **statistical models** such as **principal component analysis** and a **two-sample test of proportions** to assess significance of the resulting calculations.
- Long term, the resulting models can be applied to understand the molecular mechanisms of protein-protein interactions and for designing novel biomolecular systems.

UNIVERSITY OF MICHIGAN National Science Foundation REU Fellow | June 2014 – August 2014

- Used **data mining** techniques and structural information available in the protein data bank for well characterized interaction to **predict** other potential binders.
- Developed a model using **clustering (k-means)** and **optimization (simulated annealing)** that was able to recover most of the original interactions without prior knowledge.

RELEVANT SKILLS

Programming - Python (NumPy, SciPy, matplotlib, pandas, scikit-learn, Seaborn) • MATLAB • R • Perl • Bash • Tcl
Machine Learning - Principal Component Analysis • Unsupervised Learning (Clustering) • Optimization
Statistical Modeling - Regression • Entropy • Mutual Information • Bayesian networks • Stochastic Models
Tools - SQL • iPython • Jupyter Notebook

EDUCATION

UNIVERSITY OF CHICAGO | M.Sc. in Biophysical Sciences | June 2018 | Chicago, IL
Coursework includes Statistical Mechanics, Applied Numerical Methods in Molecular Engineering, Simulation, Modeling, and Computation in Biophysics, Machine Learning, Biophysics of Biomolecules.

WELLESLEY COLLEGE | B.A. in Chemical Physics | May 2015 | Wellesley, MA
Institutional Honors: Sigma Xi • Departmental Honors: Honors in Chemical Physics • Hypercube Prize in Chemistry.
Coursework includes Statistical Mechanics, Linear Algebra, Differential Equations, Calculus, Computational Chemistry, Physical Chemistry, Organic Chemistry.