Vivek Rai

Undergraduate student at IIT Kharagpur
A303, LBS Hall of Residence
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Interests

Computational Biology,Bio-informatics, Sequence Analysis, Machine Learning, Systems Biology

Education

Indian Institute of Technology Kharagpur Kharagpur, WB (2012-2017 expected)

- Bachelor's and Master's degree in Biotechnology and Biochemical engineering - **8.56 GPA**,
- Pursuing Minor in Mathematics and Computing,
- **Ranked 2** in class of 50 students,
- Completed 2 additional courses with **8.5 GPA**.

Shree Jain Vidyalaya Kolkata, WB (Till 2012)

- Cumulative average of 93% & 80% in final high school and senior high school examinations respectively,
- Class Topper for entire duration during schooling,
- **Awarded**: Best Student Award, Scholarship for 5 years of schooling during 2007-2012, etc.,

Work Experience

SequenceServer
Dr. Yannick Wurm http://github.com/yannickwurm/sequenceserver

- Worked with parsing and storing of the **BLAST+** output information and creating a backend data-layer for a reinforced overall application architecture, navigability, and modularity.
- Designed graphical overview scheme for obtained hit information using **d3.js** (http://www.d3js.org), a Javascript visualization library, **paper *in prep***

Sign Language Interpreter
Prof. P. Patnaik Apr, 2014

- Conceived and designed a gesture to text (or speech) application to interpret sign language gestures (non-motion) with a team of 4 people for aiding deaf and dumb people,
- Implemented Image processing techniques to obtain noise free information from real time video; classified data into relevant clusters and predicted unknown information using **K-means clustering**,
- Exploring further possibility of providing service through chat applications or online widget/web based services.

Jigsaw Puzzle Solver
Prof. S.K. Barai Mar, 2014

- Studied different techniques based on **Genetic Algorithm** to solve large piece jigsaw puzzle (randomly shuffled pieces of an image); implemented mutation strategies; came up with an approach to use this technique to solve images with non unique components;
- Implemented the program entirely from scratch in C++ using OpenCV image processing libraries; could solve upto 1000 pieces.

Automated Torn Paper Mosaicing Mar, 2014

- Collaborated with team to develop and implement algorithms to digitally stitch manually torn paper pieces to reconstruct original one with minimal loss;
- Familiarized myself with Object Oriented Design pattern, **OpenCV** image processing algorithms (Canny, Douglas-Peucker etc.,), feature extraction and analysis techniques.

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Coursework [2]

Term Paper

Comparison of Fuzzy guided Gene prediction Methods Supervisor: Prof. S.K. Barai

- Reviewed different state-of-art techniques to analyze and annotate whole organism's genome in an automated way to predict genes, and other regions of interest;
- Discussed the future prospects, and application strategies of different machine learning and heuristic techniques, and how the evolution of hybrid methods has enhanced our understanding of genome.

Core Courses (T)heory and (L)aboratory classes

- Cell and Molecular Biology (T/L)
- Microbiology (T/L)
- Genetics
- Biochemistry
- Biochemical, and Bio analytical Labs.
- Bioinformatics (T/L)#
- Protein Engineering#
- Probability and Statistics
- Statistical Decision Modelling
- Mathematics I & II

Additional Courses #To be completed by Spring 2015

- Discrete Structures
- Soft Computing Tools in Engineering

Skills

Laboratory Skills

- Microscopy
- Aseptic Techniques
- Centrifugation
- Staining, Culture, and Isolation of Microorganisms
- Cell Fractionation
- Assay techniques
- DNA Amplification (PCR)
- HPLC, FPLC
- Spectrophotometry and Spectrofluorometry
- Gas/Column Chromatography
- Gel Electrophoresis
- DNA, RNA & Protein Isolation and Purification

Programming Skills

Production Quality	Python (scipy stack), Javascript, C
Dabbled In	Ruby, R, BASH, Nodejs, d3.js, LaTeX
Platforms	Linux (primary), Windows
Bioinformatics	BLAST+, Sequence Analysis, BioPython
Practices and Tools	Git, Scientific Computing, Design Patterns

Extra Curricular Activities

- Initiated and promoted campaigns to increase participation of students from village communities for further schooling on voluntary basis.
- Co-organized multiple hackathons, online coding competitions, a Google blogger challenge, and other activities as a member of offcial Google Students Club,
- Co-authored numerous articles for *Alankar*, college's annual magazine for graduating students,
- Led a team of 6 people for participation in Inter Hall *Opensoft* competition, an annual software design competition,
- Contributed over **30 articles** and more than **1600 edits** to the English Wikipedia,[3]
- Earned Merit-cum-means scholarship for 2 consecutive years by IIT Kharagpur.

[2] Online courses not mentioned

[3] http://en.wikipedia.org/wiki/User:Vivek_Rai