Saket Choudhary

Contact Information

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Education

Indian Institute of Technology Bombay, Mumbai India
Bachelor of Technology, Master of Technology, Chemical Engineering [2009 – 2014]
Dissertation Topic: Pattern Recognition in Clinical Data
GPA: *8.47/10*

Honors and Awards

- Provost Fellowship, University of Southern California [2014]
- Gandhian Young Technological Innovation Award for designing a low cost spectrophotometer for testing water impurity by Indian Institute of Management Ahemdabad [2013]
- Institute Organizational Color for excellence in Organizational activities as a Web Manager for the UG Academic Council [2013]
- Institute Technical Special Mention for contributing actively to technical activities [2012]
- Undergraduate Research Award for developing 'Scilab on Cloud' [2012]
- Institute Technical Special Mention for improving studnt participation in technical activities, while working as a core team member of the Student Technical Body [2011]
- Institute Technical Special Mention for contributing to Institute's Technical activities as a freshman [2010]
- Kishor Vaignyanik Protsahan Yojana(KVPY) Fellowship by Indian Institute of Science, granted to 125 students in India [2007]
- Homi Bhabha Young Scientists' Gold Medal by Bombay's Science Teacher Association [2005]

Olympiads

- **Top 250** in **Indian National Physics Olympiad (INPhO)** [2009]
- Amongst **Top 6** and **Top 30** to appear for **Indian National Mathematics Olympiad(INMO)** for two consecutive years from Mumbai [2005,06]
- **Top 300** in **Indian National Astronomy Olympiad (INAO)** [2009]

Conferences/ Publications

Saket Choudhary and Santosh Noronha. *GalDrive: Pipeline for comparative identification of driver mutations using the Galaxy framework* biorXiv [*Preprint*]

Saket Choudhary, Vishnu Raj, Sanmugasunadaram K, Gyan Singh Patel and Kannan Moudgalaya. *Scilab on Cloud and Textbook Companion Project: A Web 2.0 Service for Open Source Education*, 2013 International Conference on Cloud Computing and Big Data (IEEE Cloudcom-Asia) IEEEXplore

Pradip Gatkine, Swati Gatkine, Sushanth Poojary, **Saket Choudhary**, Santosh Noronha. *Development of Piezo-electric Sensor Based Non-invasive Low Cost Arterial Pulse Analyzer*, 6th Biomedical Engineering International Conference 2013 IEEEXplore

Yogesh Dilip Save, Rakhi R, Shambhulingayya N. D., Ambikeshwar Srivastava, Manas Ranjan Das, **Saket Choudhary** and Kannan Moudgalya. *Oscad: An open source EDA tool for circuit design simulation, analysis and PCB design* ,2013 IEEE International Conference on Electronics, Circuits, and Systems IEEEXplore

Research Experience

Patter Recognition in Clinical Data, Masters Thesis April, 2013 - ongoing
Guide: Prof. Santosh Noronha *Dept. of Chemical Engineering, IIT Bombay*

Cancer is a disease known to be affected by mutations. These mutations however may not all be significant. Distinguishing driver mutations from passengers is a non-trivial problem. We are trying to explore integrative approaches in significant mutation discovery by integrating analysis at multiple levels. The current methods are either focused on functional pathway analysis or machine learning. We developed a Galaxy based toolbox to run multiple such prediction tools at once, thus removing the need to convert data formats, in a reproducible manner. The end results were displayed as a heatmap, to give an insight into those mutations which are predicted to be drivers, by all the tools, thus possibly reducing the set of mutations to the 'real' drivers. As part of a collaboration with Dr. Sanjeeva Srivastava's Lab at IIT Bombay, we performed proteomics based micro-array analysis of Glioblastoma patients. We use Correspondence Analysis and recursive feature elimination to predict a smaller set of marker genes that can be used to differentiate Glioma from normal patients.

My thesis was awarded *Department Research Award*.

The Galaxy tools are hosted on Testtoolshed here

The final thesis is available here

Defense Presentation

A manuscript describing the Galaxy tool box is in preparation.

Automated Mining of Reaction Patterns May 2012-Jul 2012
Guide: Dr. Syed Asad Rahman *Janet Thornton Lab, EMBL-EBI, Cambridge(UK)*

EC-BLAST is a novel tool to compare enzymes and map reactions. I used Machine Learning(clustering) based approaches to point out misclassified enzymes in the established classification system. I also developed a RESTful web-service to allow automated job submissions that would allow the users to keep track of all submitted jobs and retrieve results on demand.

Next Generation Sequencing, Supervised Learning Project Jul,2012-Dec,2012
Guide: Prof. Santosh Noronha *Dept. of Chemical Engineering, IIT Bombay*

This project was in collaboration with Advanced Centre for Treatment, Research and Education in Cancer (ACTREC). Surveyed literature on Next Generation Sequencing techniques and developed automated pipelines using Python to analyze whole genome data of cancer tumors. As part of the project I contributed open source modules for BWA and Samtools for Biopython, a Python based open source library for bioinformatics.

Professional Experience

SlideShare May 2011-Jul 2011
Software Engineering Intern New Delhi, India

- Slideshare `http://www.slideshare.net` is an online platform to view and upload presentations
- Deployed a Ruby on Rails module to allow administrators to delete/suspend defunct users and slideshows using filters
- Tool is being used currently at SlideShare internally for management of users and slideshows

iDiscoveri Education Dec 2011
Content Developer New Delhi, India

- Developed innovative & interactive lessons for teaching Mathematics in engaging ways
- Awarded **'Best Intern Award'** based on outstanding performance

Google Summer of Code | BioJavascript Jul, 2014-Sep, 2014
Student Contract Developer

- Worked with BioJavascript, an open source library of javascript components to represent biological data
- Developed Human Genetic Variation Viewer, a d3.js based component to visualise genetic variations in humans
- Demo: `http://saketkc.github.io/biojs`
- Screencast: `http://youtu.be/jd6S_xnCGwU`

Google Summer of Code-Penn State University | Galaxy Project July, 2013-Sep, 2013
Student Contract Developer

- Worked with Galaxy Project`http://galaxyproject.org/`, an open source web-based platform for data intensive biomedical research
- Implemented 'nested workflows' that allows users to run a workflow inside a workflow, obviating the need of replicating steps,
  `https://bitbucket.org/galaxy/galaxy-central/pull-request/229/nested-workflows`
- Added 'edit on the go' functionality to edit default parameters before runtime `https://bitbucket.org/galaxy/galaxy-central/pull-request/232/editable-workflows-gsoc2013`
- Proof Of Concept: `http://galaxy-gsoc2013.blogspot.com/2013/09/and-it-comes-to-end.html`

Google Summer of Code-Rice University | Connexions Project July, 2012-Sep, 2012
Student Contract Developer

- Developed a Python module to aid conversion of slideshows to online published notebooks using SlideShare API
- Implemented the functionality to add user defined quiz as an additional achievement
- Demo: `http://youtu.be/jfU0uj_ipY8`

Other Projects

Image Analysis of Tuberculosis samples Jan, 2013-Apr, 2013
Supervised Learning Project, Collaborator: Hinduja Hospital, Mumbai

- Implemented **image processing** algorithms for to automatically identify true positives in TB sputum images
- Developed a wxPython based **GUI** and OpenCV based **image processor**

Undergraduate Research Award Sept, 2011-Dec, 2011
Guide: Prof. Kannan Moudagalya *Chemical Engineering Department, IIT Bombay*

- Implemented a *Python* based solution for porting *Scilab* on Cloud, thus developing a solution for running Scilab codes on the browser

- Awarded *Undergraduate Research Award*
- Accepted for IEEE Cloudcom-asia conference

Pratham, Student Satellite Programme May, 2010-Oct, 2010
Part of First Student's Satellite Team *IIT Bombay*
- Pratham is an interdisciplinary programme aiming to build a cubesat,to measure the Total Electron Count in the atmosphere
- Implemented ADC submodule on ATMEGA32, performed **hardware testing**

IIT Bombay Grading System on SMS Oct, 2011-Dec, 2011
Course Project
- Developed a Python/Flask(microframework) based app to automatically **scrape** the IITB webpages
- Used the TxtWeb SMS API to receive queries on SMS and send back the fetched grades from the IITB servers, received **500**+ SMS requests
- Deployed a GMail based chat bot to perform similar operations, received more than **1000** chat requests

DropBox on SMS Jul, 2011
Student Hacker *Yahoo! Open Hack India, Bengaluru*
- Shortlisted among the **Top 50** hacks from around 150 hacks from **all over India**
- Implemented emailing a file in user's dropbox folder to a specified user by using Dropbox & TxtWeb API

DriveStack Oct, 2012
Team of 3 *Yahoo! HackU, IIT Bombay*
- Finished 1^{st} **among 40**+ participating teams
- Created a **mashup** of cloud storage services like DropBox,Google Drive to provide one full stack of cloud storage

GigBook, a Facebook App Oct, 2010
Students Hackers, Team of 3 *Yahoo! HACKU IIT Bombay*
- Developed a Facebook App to fetch the Music Related Likes of a user from his Facebook account using YQL and last.fm API
- The upcoming concerts of the users favourite band can be mapped on Yahoo Maps thus enabling a visual picture of all concert locations

Pivotal Tracker Email Wrapper July, 2011
Open Source Contribution to Pivotal Labs
- Pivotal Tracker is an online agile project management tool
- This is now an **Official Third Party Tool** featured by Pivotal Labs at : `http://www.pivotaltracker.com/help/thirdpartytools`

Open GPS Mapper May, 2010-June, 2010
Web And Coding Club Summer Project, IIT Bombay *IIT Bombay*
- Wrote a GUI in Perl using Tk Library to establish communication between the computer and handheld GPS device. The hex data was converted to its ascii counterpart and stored in a file

Digital Audio Player IIT Bombay

Electronics Club Summer Project, IIT Bombay *May, 2010-June, 2010*

- Implemented the $FAT32$ file system reading code for reading the .wav files stored on a SD card
- **ATMEGA16** was used to play pre-recorded songs on SD card through *Pulse Width Modulation*

Teaching Experience

Teaching Assistant, Computer Programming and Utilisation Autumn 2011

- Selected as an Undergraduate Teaching Assistant on the basis of past performance
- Mentored students for Lab Sessions and Projects assist in conduct of examination and evaluation

Teaching Assistant, Artificial Intelligence in Process Engineering Autumn 2011

- Involved in contributing to forum posts, evaluating answer scripts

Positions of Responsibility

Web Manager, UG Academic Council July, 2012-April, 2013

- Initiated a number of web portals for improving the accessibility of academic resources to the students
- Implemented Online Notice Board System via Institute's Gymkhana website
- Awarded **Institute Organizational Color**

Institute Internship Coordinator, Practical Training Cell July,2011-April,2012

- Initiated Industry & University Interaction for internships
- Number of internships registered a 40 percent growth

TechniC, Core Group Member, July, 2010-April, 2011

- Organised technical events inside the institute along with nine other members
- Mentored students for various technical competitions

Standardised Test Scores

- GRE: Quantitative: 70/170 Verbal: 153/170 Analytical Writing: 3.5/6.0
- TOEFL: Reading: 29/30 Listening: 28/30 Speaking: 24/30 Writing:28/30 Total: 109/120