Somesh Venkatakrishnan Sai

Personal Info

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Skills

1. Programming (R, Python, SQL, Bash scripting)
2. Linux and HPC systems
3. Version control system (Git)
4. -*Omics* data analysis
5. Familiar with Bioinformatics software (SeaView, BEAST, PyMol, AutoDock)
6. Communication skills
7. Public speaking skills

Languages

1. English - Full Proficiency (ETS TOEFL 2015 - 112/120)
2. German - Basic (Level A1.2)

Relevant Coursework

Graduate:
Computational Statistics,
Statistical Analysis of High-Throughput Data
Statistical Models in Computational Biology,
Evolutionary Dynamics

Undergraduate:
Database Management Systems,
Probability and Statistics,
Genomics and Proteomics

References

1. Sascha Sauer, BIH (sascha.sauer@mdc-berlin.de)
2. Florian Kiefer, Novartis (florian.kiefer@novartis.com)
3. Dr. Rachel Warnock, ETHZ (rachel.warnock@bsse.ethz.ch)

Education

Ph.D. Candidate in Bioinformatics, **2019 – Present**
Max Delbrück Centrum für Molekulare Medizin (MDC), Berlin, Germany

MSc Computational Biology and Bioinformatics, **2016 – 2019**
ETH Zürich, Switzerland
CGPA: 4.86 / 6

B.Tech Bioinformatics, **2012 – 2016**
Vellore Institute of Technology (VIT) University, India
CGPA: 9.37 / 10

Master Thesis

Title: *Using deep learning to explore the effectiveness of biological features for transcription factor interaction prediction*

Supervisors:
1. Florian Kiefer, Novartis AG, Basel
2. Prof. Dr. Christian von Mering, Universität Zürich

Description:
Using deep architectures of artificial neural networks to predict protein-protein interactions and identify putative interactions for proteins of interests. At the same time, suitability of biological/content-driven features for interaction prediction was evaluated and the effects of underlying distribution of the data on the performance of the model was also examined.

Bachelor Thesis

Title: *Deciphering the mechanism of Salt Stress Regulation Machinery in Oryza Sativa using systems biology approach*

Supervisor: Prof. Dr. Sajitha Lulu

Description:
Identification of novel nodes which may be responsible to mitigate salt stress in rice and understanding the mechanism of their regulation and interaction using network analysis.

Projects and Experience

1. Graduate Researcher, *MDC, Berlin* **2019 - Present**

- Undertaking analysis of several single-cell sequencing projects, in-house and with collaborators.
- Data analysis of several other technologies (for e.g. ATAC-seq, Mass Cytometry, etc.)

2. Lab Rotation Projects, *ETH Zürich.* **2017**

- Semester lab rotation student in Prof. Dr. Tanja Stadler's lab @ D-BSSE, under the supervision of Dr. Rachel Warnock. Extended the functionality of FOSSILSIM R package for simulating extinct species sampling by using of heterogeneous rates for dataset generation of simulated fossils from any desired rate distribution.
- Semester lab rotation student in Prof. Dr. Manfred Claassen's lab @ IMSB. Involved in the testing of representation learning method (CellCnn) to identify rare disease associated cell subsets in diabetes datasets.

3. Course Project, *Statistical Analysis of High-Throughput Data,* Universität Zürich. **2016**

This end-of-semester group project aimed at reproducing results of published work by Bruggner *et al.* on automatic identification of stratifying signatures in cellular subpopulations using a novel method called CITRUS. My contribution to this project involved data transformation, result interpretation, calculation and plotting of model error rates.

4. Undergraduate Research Assistant, **2015**

School of Biological Sciences, University of Calgary, Canada.

A three month research internship in the lab of Prof. Dr. Zimmerly. The project included phylogenetic analysis of bacterial introns using computational tools like HyPhy, RaxML, etc., and prediction of secondary structures of diversity generating retroelements. This research internship was part of the Mitacs Globalink Research Program.

5. Semester Project, *SBST, VIT University.* **2014 – 2015**

Undertook a semester project under the supervision of Prof. Dr. Sajitha Lulu

Performed computational investigation of POMC gene through SNP analysis, *ab-initio* modeling of the gene product and performed molecular dynamics simulations to assess the stability of SNPs.

Led to a poster presentation at the 8th National Symposium cum Workshop on 'Recent Trends in Structural Bioinformatics and Computer Aided Drug Design', 2016 at Alagappa University, Karaikudi, India.

Internship

Master Student Intern, *Novartis AG,* Basel. **2017 – 2018**

Twelve month internship under Florian Kiefer. Worked on the following projects:

1. Prediction of protein-protein interactions using deep learning methods. This was also the topic of my master thesis project. Further, this project was expanded to collaborate with in-house project teams to assist their efforts of identifying interacting partners.
2. Prediction of protein contact maps by identifying and validating residue-residue contacts for protein complexes.

Achievements

Mitacs Globalink Research Intern Fellowship **2015**

Received full scholarship for travel and stay during 12 week research internship period in Calgary, Canada.

VIT University Merit Scholarship **2013 – 2016**

Received merit scholarships annually for being in the Top 5 of the batch.

Roles and Responsibilities

PhD Representative *MDC.* **2019 – Present**

Elected in December 2019. Current responsibilites include:

1. Maintaining flow of information between other PhD representatives and all PhD students
2. Addressing the concerns of fellow PhD students in a timely fashion.

Make A Difference (MAD), *VIT University.* **2012 – 2015**

A youth volunteer network working to empower children at risk in shelter homes. My roles included:

1. Joined as a volunteer in 2012 and assisted the children in their learning process with weekly classes and activities.
2. Promoted to the role of Mentor in 2013. Effectively managed a team of 10 new volunteers and ensured proper coordination and undertook delegation of required tasks.
3. Headed the transport team in the logistics division for the annual Dream Camp - a three day event filled with various informative activities for the children.