Harihara Subrahmaniam Muralidharan

CONTACT

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WEBSITE

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EDUCATION

University of Maryland, College Park, USA — Aug 2018 - Present
Doctor of Philosophy, Computer Science. — GPA:3.83/4
Advisor: Prof. Mihai Pop

SASTRA University, India — Jul 2011 - Jun 2015
Bachelor of Technology,
Computer Science and Engineering, — GPA:8.96/10

RESEARCH EXPERIENCE

Graduate Research Assistant at Poplab, Center for Bioinformatics and Computational Biology(CBCB), University of Maryland, College park. (Jan 2019 - Present)
Research Areas: Computational Genomics, Metagenomics
Working on algorithms and methods to

- characterize structural variants from metagenomic assembly graphs
- mine novel phage elements using an ensemble of graph features and sequence similarity features (PIRATE)
- bin metagenomic samples using a combination of coverage and assembly graph mate-pair information (Binnacle)

Researcher at Tata Consultancy Services Ltd. (TCS) Innovation labs, Chennai, India. (Aug 2015 - Aug 2018)
Research Areas: Machine Learning, Cyberphysical Systems, Optimization
Analytics for Cyberphysical Systems. Identify suitable models using data driven methods and domain physics to provide solutions on real time sensory data.

- Developed a solution to benchmark performance of VCRS (Vapor Compression Refrigeration Systems) with incomplete thermodynamic cycle information
- Modeling and analysis of real time data from wind turbines
- A scalable decision framework for demand response with a district cooling plant that minimizes the occupant thermal discomfort while meeting the expected energy reduction

Research Internship Universitat Politècnica de Catalunya (UPC), Barcelona, Spain. (Feb 2015 - Jun 2015)
Research Areas : Learning Analytics, Measurement of Intangibles, Information Modeling

- Thesis titled "Enhancing Learning Analytics Platform for Secondary Schools: Design and Development of Indicators"
- Designed algorithms to measure indicators of motivation from the digital footprints of students' MOODLE logs

PUBLICATIONS

1. **Harihara Subrahmaniam Muralidharan***, Nidhi Shah*, Jacquelyn S Meisel, Mihai Pop(2021), "Binnacle: Using Scaffolds to Improve the Contiguity and Quality of Metagenomic Bins", Frontiers in Microbiology 12:638561. doi: 10.3389/fmicb.2021.638561[*-Equal Contribution]
2. Srinarayana Nagarathinam, **Harihara Subrahmaniam Muralidharan**, Arunchandar Vasan, Venkatesh Sarangan, Sermisha Narayana, Anand Sivasubramaniam(2019), "One for all, All for one: a scalable decision-making framework for demand response with a district cooling plant", International Conference on Systems for Energy-Efficient Buildings, Cities, and Transportation(Buildsys), doi: 10.1145/3360322.3360850.

TALKS AND PRESENTATIONS

1. "One for all, All for one: a scalable decision-making framework for demand response with a district cooling plant", International Conference on Systems for Energy-Efficient Built Environments (BuildSys 2019). Nov 2019
2. "PIRATE: Phage Identification fRom Assembly-graph varianT Elements", International Conference on Intelligent Systems for Molecular Biology (ISMB 2020). Jul 2020
3. Presented a poster of "PIRATE", Cold Spring Harbor Laboratory, Microbiome Meetings. Oct 2020
4. Presented a poster titled "Comparative Metagenomic Genome Analysis of Synechococcus spp. in Microbial Mats Across a Temperature Gradient in Hot Springs From Yellowstone National Park", Cold Spring Harbor Laboratory, Genome Informatics Workshops. Nov 2021

GRADUATE COURSEWORK

Machine Learning, Advanced Numerical Optimization, Computational Geometry, Computational Linguistics-II, Computational Genomics, Unsupervised Learning, Computational and Mathematical Analysis of Biological Networks Across Scales, Data Structures, Algorithms and Inference for High-Throughput Genomics, Algorithmic Evolutionary Biology

TEACHING EXPERIENCE

1. Teaching Assistant for Introduction to Data science (python) (Fall 2018)
2. Teaching Assistant for Introduction to Data science (R) (Spring 2019)
3. Teaching Assistant for Introduction to Algorithms (Fall 2019)

MISCELLANEOUS

1. Dean's List Merit Scholarship for outstanding performance in academics in all 4 years of undergraduate. (2011 - 2015)
2. Deshvidesh Scholarship to do Bachelor's Thesis at Universitat Politècnica de Catalunya (UPC), Barcelona. (2015)

VOLUNTARY SERVICE

Reviewer at IEEE CDC (2018), WABI (2020), ISMB (2021)

PROGRAMMING SKILLS

Languages-Python, C++, Java, R, shell

Python Machine Learning-Scikit sklearn, Keras, Numpy, PyTorch, TensorFlow

Others-MATLAB, EnergyPlus, SLURM for HPC Environment

LANGUAGES

Tamil (Native), English (Fluent)