Harihara Subrahmaniam Muralidharan

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EDUCATION

University of Maryland, College Park, MD, USA
Ph.D, Computer Science, August 2018 - Present   GPA:3.83/4
Advisor: Prof. Mihai Pop

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

SASTRA University, Thirumalaisamudhiram, India
B.Tech, Computer Science and Engineering, July 2011 - June 2015   GPA:8.96/10

RESEARCH EXPERIENCE

Graduate Research Assistant at Poplab, Center for Bioinformatics and Computational Biology(CBCB), University of Maryland, College park. (Jan '19-Present)
Research Areas: Computational Genomics, Metagenomics
Working on algorithms and methods to

- extract 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)

- characterize mobile genetic elements (MGEs) from metagenomic samples

Researcher at Tata Consultancy Services Ltd. (TCS) Innovation labs, Chennai, India. (Aug '15-Aug '18)
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 '15-Jun '15)
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. 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), https://doi.org/10.1145/3360322.3360850.

2. **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]

3. Jacquelyn S Meisel, **Harihara Subrahmaniam Muralidharan**, Jay Ghurye, Todd Treangen, Sergey Koren, Marcus Fedarko, Mihai Pop, "Graph-based variant discovery reveals novel dynamics in the human microbiome", (IN PREPARATION).

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 '19). Nov '19

2. "PIRATE: Phage Identification fRom Assembly-graph varianT Elements", International Conference on Intelligent Systems for Molecular Biology (ISMB '20). July '20

3. Presented a poster of "PIRATE", Cold Spring Harbor Laboratory, Microbiome Meetings. Oct '20

TEACHING EXPERIENCE

1. Teaching Assistant for Introduction to Data science (python)(Fall '18)
2. Teaching Assistant for Introduction to Data science (R)(Spring '19)
3. Teaching Assistant for Introduction to Algorithms(Fall '19)

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)

3. Students chairman of ACE (Association of Computer Engineers) at SASTRA University. (2014-2015)

4. 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)