Stony Brook University

Biomedical Informatics Grand Rounds

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Biological solutions to two fundamental computing problems

Wednesday, Sept 9, 2020 3 pm - 4 pm

Abstract:

Many biological systems can be viewed as algorithms designed by evolution to solve computational problems. I will present two such examples. First, I will describe how the olfactory circuit in the fruit fly brain solves the similarity search problem using a novel variant of a traditional computer science algorithm, called locality-sensitive hashing. Second, I will describe how plant architectures trade-off between common network design objectives — minimizing both transport distances and costs in building infrastructure — using the theory of Pareto optimality. Overall, we hope that insights into biological problem-solving strategies can lead to new algorithms and experimental hypotheses about biological functions. This is joint work with Adam Conn, Joanne Chory, Sanjoy Dasgupta, Ullas Pedmale, and Chuck Stevens.

Bio:

Saket Navlakha is an Associate Professor in the Simons Center for Quantitative Biology at Cold Spring Harbor Laboratory. He received an A.A. from Simon's Rock College in 2002, a B.S. from Cornell University in 2005, and a Ph.D. in computer science from the University of Maryland College Park in 2010. He then became a post-doc in the Machine Learning Department at Carnegie Mellon University before becoming an Assistant Professor at the Salk Institute for Biological Studies in 2014. His lab studies algorithms in nature, i.e., how collections of molecules, cells, and organisms process information and solve computational problems. In 2018, he was named a Pew Biomedical Scholar, and in 2019, he was awarded an NSF CAREER award.

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Questions? Please call the Biomedical Informatics Department at 631-638-2590.