MSCS Mess

Department of Mathematics, Statistics, and Computer Science
St. Oaf College, Northfield, MN 55057
November 13, 2015 http://wp.stolaf.edu/mscs/mscs-mess/ Volume 44, No. 9

MSCS Research Seminar

Title:	Computational Characterization of Intra-Tumor Heterogeneity in Cancer
Speaker:	Layla Oesper
Date:	Friday, November 20
Time:	3:30 pm- 4:30 pm
Location:	RNS 204

About the talk: Cancer is a disease resulting from somatic mutations – those that occur during the individual's lifetime – and cause the uncontrolled growth of a collection of cells into a tumor. As we enter the era of personalized medicine, where a patient's treatment may be tailored to their specific genomic architecture, accurate identification of the set of mutations within each patient's genome is increasingly important. Despite numerous recent advances in DNA sequencing technologies, many challenges still exist for measuring and interpreting genomic mutations -- especially for cancer genomes. For example, tumors often exhibit intra-tumor heterogeneity where individual cells in a single tumor contain different complements of mutations. In this talk, I will describe several algorithms that infer the composition of heterogeneous tumors, including one algorithm that reconstructs the evolutionary history of the tumor.

About the speaker: Layla Oesper is an Assistant Professor in the Computer Science department at Carleton College. Her research centers around designing algorithms for analysis of high-throughput DNA sequencing data. In particular, her work focuses around application in cancer genomics. Previously, she was a post-doctoral researcher and graduate student in the CS department at Brown University where she worked with Ben Raphael. She received a PhD and ScM in CS from Brown University and a BA in Mathematics from Pomona College. She also spent several years working for Epic as a software tester.

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From the Editor

For those in a proof-writing course, here are some definitions of terms commonly used in math:

CLEARLY: I don't want to write down all the in-between steps.
TRIVIAL: If I have to show you how to do this, you're in the wrong class.
RECALL: I shouldn't have to tell you this, but for those of you who erase your memory tapes after every test, here it is again.
WLOG: I'm not about to do all the possible cases, so I'll do one and let you figure out the rest.
ONE MAY SHOW: One did, his name was Gauss.
IT IS WELL KNOWN: See "Mathematische Zeitschrift", vol XXXVI, 1892.
HINT: The hardest of several possible ways to do a proof.
BRUTE FORCE: Four special cases, three

counting arguments, two long inductions, and a partridge in a pair tree.
ELEGANT PROOF: Requires no previous knowledge of the subject, and is less than ten lines long.
SIMILARLY: At least one line of the proof of this case is the same as before.
THE FOLLOWING ARE EQUIVALENT: If I say this it means that, and if I say that it means the other thing, and if I say the other thing...
BY A PREVIOUS THEOREM: I don't remember how it goes (come to think of it, I'm not really sure we did this at all), but if I stated it right, then the rest of this follows.
FINALLY: Only ten more steps to go...
Q.E.D. : T.G.I.F.
PROOF OMITTED: Trust me, it's true.

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