2022 Kemeny Public Lecture

Wednesday, May 4, 2022
6:00 – 7:00PM
Life Sciences Center 100
Arvo J. Oopik '78 Auditorium

Anna Gilbert, Yale University
John C. Malone Professor of Mathematics and
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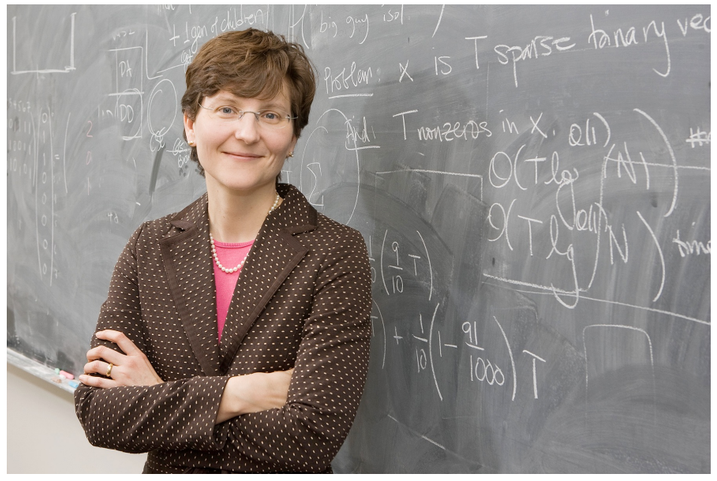
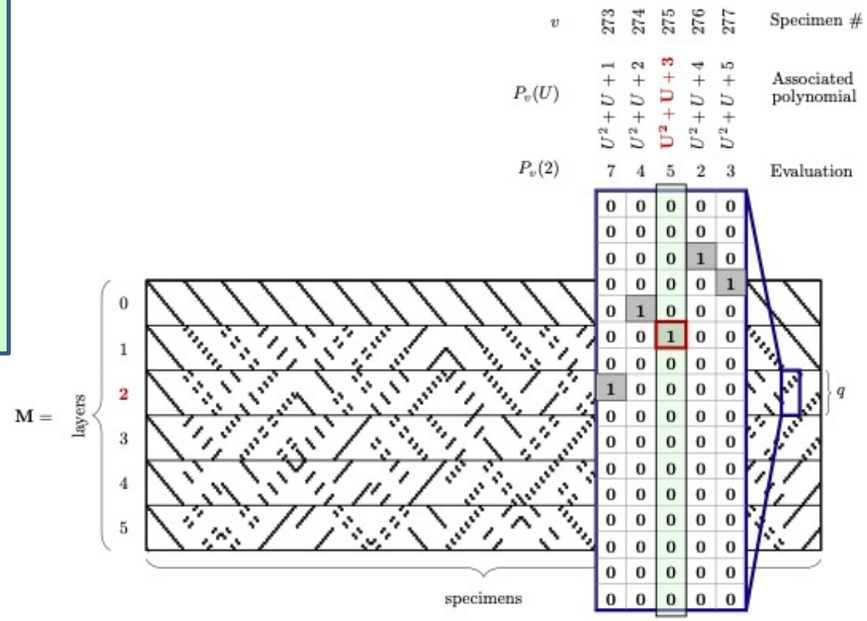
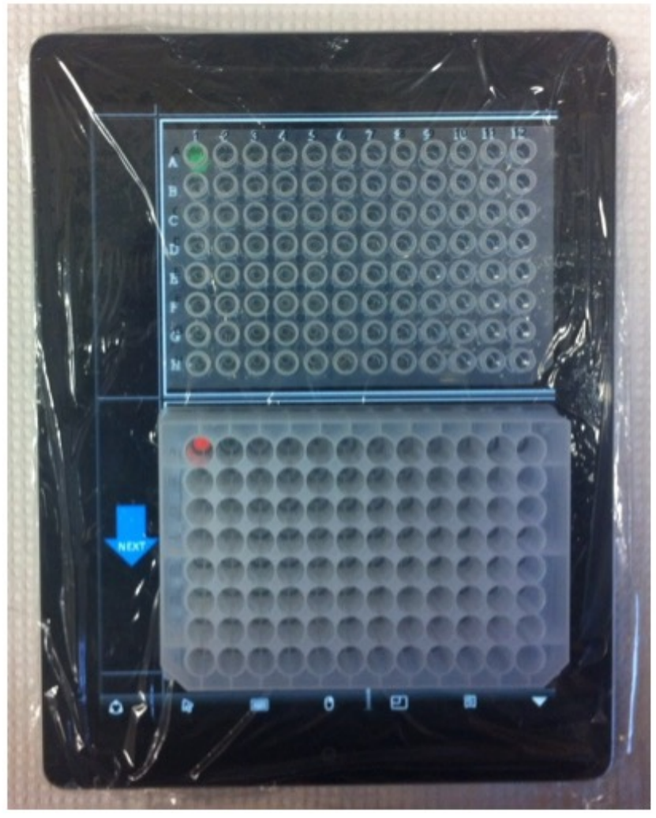


Combinatorial group testing designs and algorithms: pooled testing for biological applications





Since the beginning of the COVID-19 pandemic, there has been considerable interest and discussion in both the popular media and the scientific/medical literature on pooled testing for COVID. Indeed, in June 2020, the FDA released guidelines on pooled testing procedures that are now available to diagnostic laboratories.

Pooled testing, as described in the popular press and the FDA's ruling, is one model for combinatorial group testing. In this talk, I will discuss a variety of mathematical models for combinatorial group testing, including the design of both the pooling matrix and the decoding algorithms. I will cover major mathematical and algorithmic results in combinatorial group testing and then address what these mathematical results have to say about the practical application of pooled testing. The mathematical tools span a variety of areas from error correcting codes to expander graphs. As with many scientific and technological endeavors, the gap between theory and practice is enormous. (While many of the popular press articles detailed the origins of combinatorial group testing, many left out that it was never actually used in its original form!) On a more positive note, I will give some examples of where combinatorial group testing is used in "theory applications."

For more information: http://www.math.dartmouth.edu/activities/kemeny-lectures/