PROGRAM ABSTRACTS

ALON AMIT, Origami Logic; *Randomness in Theory and Practice.*

Abstract: We don't normally think of "do it at random" as a useful approach to performing a task or constructing a complex structure. In this talk we will present some areas where this, surprisingly, has actually been the case: The Probabilistic Method can be used to show the existence of combinatorial objects that are very difficult to build explicitly, and randomized algorithms are used in many places where they seem to perform much better than any approach which is restricted from flipping a coin.

BIN YU, University of California at Berkeley; *Movie Reconstruction from Brain Signals: "Mind-Reading"*

Abstract: Least Squares, a time-tested method for fitting a linear model to data, attained prominence as far back as 1801 when it was used by Johan Carl Friedrich Gauss to fit astronomical data and predict the trajectory of the newly-discovered asteroid Ceres. In a thrilling breakthrough at the intersection of neuroscience and statistics, penalized Least Squares methods have been used to construct a "mind-reading" algorithm that reconstructs movies from MRI brain signals. The story of this algorithm is a fascinating tale of the interdisciplinary research that led to the development of the system that was selected as one of Time Magazine's 50 Best Inventions of 2011.

CHRISTOS H. PAPADIMITRIOU, University of California at Berkeley; *The History behind Logicomix*

Abstract: I propose to talk about "the intellectual roots of the computer and the internet", where I will talk for about 30 mins on the math and history of science behind *Logicomix*.

PHIL DARO, Strategic Education Research Partnership; *Common Core State Standards – Mathematics: A perspective from a member of the writing team*

Abstract: The Common Core State Standards - Mathematics (CCSS-M) were designed to solve an educational problem. The good intentions of the design, however, can drown in the politics of accountability, teacher policy and public education. The biggest education problem in school mathematics on which the writing team focused its efforts was the "mile wide, inch deep" configuration of the American school curriculum. The CCSS-M propose a shift in the perspective toward mathematics taught in schools: less emphasis on a fragmented multitude of special solution methods, especially tricks that avoid underlying mathematical principles; more emphasis on core principles and practices that unify and focus mathematical thinking.

Standards can help solve this kind of curriculum architecture problem, but we all face more detailed and difficult challenges of instructional materials, assessment, and program design, as well as the even more area of teacher preparation and continuing education. The speaker will reflect on how the good intentions of the writing team a few years ago are breaking on the rocky shores of today's realities.

ZVEZDELINA STANKOVA, Mills College; *Restricted Patterns: Snippets, Ideas, and Future*

Abstract: Restricted patterns made their official debut in the 80's through works of Simion, Wilf, Lovász, and others, but they had already appeared in the 60's via Robinson-Schensted's, Knuth's and Stanley's earlier results. Whether you tackle Catalan or Fibonacci numbers, Dyck paths or Young diagrams, generating trees or Chebychev polynomials, restricted patterns are likely to appear in one way or another. The rebirth of the topic was initiated by West at MIT in 1992. Yet, the ever-tempting Wilf-classification of restricted patterns is still an open question. In this talk, we shall discuss several paths of pattern-exploration, and think about whether among the array of generated ideas and methods there is a "true" way of approaching pattern-avoidance equivalence and ordering.