MAY 16, 2019 | Student Probability Day VII

Speaker	Title & Abstract
Avraham Re'em Nachi	**The Orbital Equivalence Class of the Shift**
	We introduce the notion of orbital equivalence of dynamical systems and the celebrated theorem of H. Dye (1959) concerning measure preserving transformations. Next we discuss a (much) wider family of transformations, introducing to the audience non-singular ergodic theory and shortly mention the fundamental classication theorems due to W. Krieger (~1970). Finally, we will talk about a family of results from recent years, concerning a rigidity phenomena of the orbital equivalence class of the shift (Koslo, Danilenko, Lemanczyk). Here I should mention that a seminar on Dye's and Kriger's Theorems is planned at HUJI for the next semester (rst semester of 2019-2020).
Budzinski Thomas	**Local limits of uniform triangulations in high genus**
	We are interested in the local limits of uniform triangulations chosen uniformly over those with fixed size and genus. More precisely, we study the regime where the genus is proportional to the size, and prove convergence to models of hyperbolic infinite random triangulations. As a consequence, we obtain new asymptotics on the enumeration of high genus triangulations. Joint work with Baptiste Louf.
Gabor Uri	**Finitary coding and the classification of stationary processes.**
	Given two stationary processes X=(X_{n})_{n\in\mathbb{Z}},Y=(Y_{n})_{n\in\mathbb{Z}}, when can Y be expressed as Y=F(X) for some measurable function F which commutes with time shifting? Classification theorems in ergodic theory aim to answer problems of this kind, most celebrated of them is the Ornstein's isomorphism theorem, which gives a sufficient conditions for X and Y to have relations of the kind mentioned above. Ornstein's theorem was later strengthened, showing that with the same conditions, one can require all functions F that are involved to be finitary, which loosely means that each coordinate of F(X) is determined by a finite number of coordinates of X. This result arose questions and conjectures about other classification theorems that possibly could be lifted to the finitary setup. We will discuss these parts of classification theory, and explain why these conjectures eventually fail to be true.
Glazer Itay	**On uniform behavior of families of random walks induced by word maps**
	Given a word, i.e an element w in a free group F_r on a set of r elements, and a finite group G, one can associate a map w:G^r-->G referred to as a word map. A word map as above induces a natural probability measure on G, and varying over different finite groups G, we can study the corresponding family of random walks. It turns out that these random walks have uniform behavior over certain interesting families of finite groups. In this talk we will discuss this phenomenon and provide an (algebro-)geometric interpretation of it. This is a work in progress (joint with Yotam Hendel).
Grinshpon Yoel	**Fluctuations of linear statistics for Schroedinger operators with a random decaying potential**
	Linear statistics provide a tool for the analysis of fluctuations of random measures and have been extensively studied for various models in random matrix theory. In this talk we discuss the application of the same philosophy to the analysis of the finite volume This is joint work with Jonathan Breuer and Moshe White.eigenvalue counting measure of one dimensional Schroedinger operators and demonstrate it with some interesting results in the case of a random decaying potential.

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Gross Renan	**What to do when all you have is Brownian motion**
	Many times in life you want to sample from some given distribution, but when you search your pockets all you have is Brownian motion. Can you still sample from your desired distribution, by stopping the Brownian motion at some random time? The Skorokhod embedding theorem says ``yes!'', and under very mild conditions. In this talk we will review the problem and see a new solution based on conformal invariance.
Hanany Liam	**Word measures on the symmetric group.**
	Given a word w in the free group on k generators, the word measure induced by w on the symmetric group S_{n} is the distribution obtained when substituting k independent uniform permutations into the word w. Puder and Parzanchevsky (2015) estimated the expected number of fixed points of a permutation sampled according to this distribution,. We generalize this result to the expected number of cycles of a constant length. Based on joint work with Doron Puder.
Jiang LI	**The power of d-thinning in load balancing.**
	In the classical balls-and-bins model, n balls are allocated into n bins one by one uniformly at random. We consider the following variant of this model. For each ball, after a random allocation has been generated, an overseer may decide, based on all previous history, whether to accept or reject this allocation. However, one of every d consecutive suggested allocations must be accepted. We show that after n balls have been allocated, the least achievable maximum load is (d+o(1))(d log n/ log log n)^{1/d} with high probability. This is in contrast with the related multiple-choice model, in which the number of alternative choices offered to the overseer merely affects the achievable maximum load by a multiplicative constant. (joint work with Ohad N. Feldheim and Ori Gurel-Gurevich).
Kaspi Haya	**Local Times of Markov Processes and Infinitely Divisible Permanental Processes**
	Permanental processes are a certain class of Gamma processes that gen- eralize squared Gaussian processes. One class of Permanentals is connected with Markov processes, their defining parameters are the potential densities of a corresponding Markov process. Permanental processes thus associated with Markov processes are infinitely divisible. There is a formula that connects the local time process, indexed by the states of the corresponding Markov process and its associated Permanental Process called **Isomorphism Theorem**. This theorem extends the celebrated **Dynkin Isomorphism Theorem**, that as- sumes that the potential densities are symmetric, and has recently been used as a tool in the analysis of the Gaussian free Field. We use it, and the infinite divisibility of the Permanental process, to analyze the connections of the above local time process and the associated Permanental process and deduce sample path properties of one process from the other. Based on joint work with Nathalie Eisenbaum from CNRS Paris
Mikulincer Dan	**Stability of the Shannon-Stam inequality**
	The Shannon-Stam inequality essentially states that convolution decreases entropy, relative to the standard Gaussian. Equality holds if and only if both summands are Gaussians with proportional covariance. In this talk, we will use stochastic methods to derive an expression for the deficit of the inequality. We will also show that, in some cases, the deficit can be interpreted as a distance between the suammands and some Gaussian measure.

Speaker	Title & Abstract
Seidel Matan	**Random Walks on Circle Packings**
	A circle packing is a canonical way of representing a planar graph. There is a deep connection between the geometry of the circle packing and the probabilistic property of recurrence/transience of the simple random walk on the underlying graph, as shown in the beautiful He-Schramm Theorem. The removal of one of the theorem's assumptions - that of bounded degrees - can cause the theorem to fail. However, we show that by using certain natural weights that arise from the circle packing for a weighted random walk, (at least) one of the directions of the He-Schramm Theorem remains true. Joint work with Ori Gurel-Gurevich.
Shalev Matan	**The Diameter of Uniform Spanning Trees**
	A uniform spanning tree of a finite connected graph G is a spanning tree T_G of G drawn uniformly at random. We show that the diameter of T_G is of order \sqrt{|G|} for a large class of "high-dimensional" graphs such as expander graphs and tori of dimension above 5. Joint work with Asaf Nachmias and Peleg Michaeli.
Strzelecka Marta	**Comparison of weak and strong moments of norms of random vectors**
	In the talk we will give a brief introduction to the problem of comparison of weak and strong moments in the spirit of the Paouris inequality from 2006. We will also see how it is connected with concentration inequalities.
Stzelecki Michal	**Concentration inequalities for convex functions**
	Much research has been devoted to the interplay between various functional inequalities, transportation of measure theory, and the concentration of measure phenomenon. This talk will be about the "convex setting" where one works with measures for which concentration cannot hold for all smooth Lipschitz functions, but appropriate concentration bounds can be obtained after restricting the attention to convex (Lipschitz) functions.
Weintroub Amit	**Eigenvector's angles in the complex Ginibre ensemble**
	Studying properties of the distribution of the angles between eigenvectors of random matrices in the complex Ginibre ensemble, such as the typical angle, maximal/minimal angle and others.