



Workshop on Applied Economic Theory and Mathematics

(8th and 9th October 2026)

Abstracts

Day 1 — 8th October 2026

Talk 1 — Kivanc Akoz

Inclusive Networks: Fairness and Efficiency with Altruistic Spillovers

Abstract:

When do efficiency and fairness align in societies where individuals care about one another? We study resource allocation in networks where agents value their own welfare and that of others through distance-decaying altruism. We introduce inclusive networks, defined as both claw-free and paw-free, or equivalently, as networks whose connected components are either sparse (paths or cycles) or sufficiently dense (complete or nearly complete). In these networks, efficiency and fairness coincide regardless of the altruism profile. Inclusivity is equivalent to universal efficiency: under linear payoffs, every interior allocation is robustly Pareto efficient. With concave private utilities, a robustly Pareto efficient allocation exists if and only if the network is inclusive. We also introduce charity-freeness, requiring that no agent wishes to alter an allocation through unilateral transfers. An allocation that is both charity-free and Pareto efficient for all discount factors exists if and only if the network is inclusive.

Talk 2 — Kiriti Kanjilal

Demand-Driven Mergers: Advertising, Differentiation, and Welfare

Abstract:

We consider mergers that induce demand changes. We study the firms' incentives to submit a merger request and the competition authority's decision to approve the request. We show that merger-induced demand changes help expand settings where the interests of firms and competition authority align, whereas contexts where their interests are misaligned become less likely. We allow for several extensions, showing that more severe cost convexities make it more likely for firms to submit merger requests that are detrimental for consumers, whereas more differentiated products or allowing firms to invest in advertising

reduce this type of mergers, thus helping align the preferences of the merged entity and the competition authority.

Talk 3 — Yuliya Veselova

Kemeny Efficiency of Social Choice Rules

Abstract:

We introduce Kemeny efficiency: the probability that a voting rule outputs a ranking with the minimal total Kemeny distance to the voters' preference orders. Computing the exact Kemeny ranking is NP-hard, so the measure shows how close practical rules come to the consensus ranking. For three alternatives we estimate it computationally under the Impartial Culture (IC) and Impartial Anonymous Culture (IAC) models. Copeland and Borda stay closest to the Kemeny rule, while Plurality, Nanson and Threshold fall to roughly 0.5–0.55 at $n=1000$. We also study a complementary measure, the average normalized gap between a rule's total distance and the minimum. Finally, we prove that Plurality and Antiplurality coincide with the Kemeny rule on a transformed domain of truncated ballots, which helps explain their low efficiency on full profiles.

Talk 4 — Alexey Myachin

Pattern Analysis Methods for Multivariate Data

Abstract:

One of the problems in multidimensional data analysis is the identification of groups of objects whose feature values exhibit the same relational structure. This paper considers a family of pattern analysis methods designed to address this problem. The methods include ordinal-fixed, ordinal-invariant, diffusion-invariant pattern clustering, tunnel clustering, as well as interval-fixed, ordinal-interval, and diffusion-interval pattern clustering. The general principles underlying these methods are formulated, and the conditions determining their applicability are identified. For several methods, invariance with respect to specific transformations of the input data is established. In addition, an approach based on cubic splines is proposed for analysing the shape of object profiles represented in parallel coordinates. The effects of positive rescaling of features and uniform shifts of their values on the resulting analysis are examined. The methods are evaluated on synthetic datasets containing up to one million objects. During data generation, feature scales, profile shapes, and the degree of violation of order relations are varied in a controlled manner. The experiments are used to compare the applicability, robustness, and limitations of the considered methods and to demonstrate their behaviour under different data structures and controlled distortions.

Talk 5 — Ruhi Sonal

Dynamic Random Choice with Inattention

Abstract:

We model random choice when an attention-constrained decision maker (DM) chooses repeatedly from a set of alternatives. The DM's attention to each alternative in every time period may vary and attention may accumulate over time. We axiomatically characterize a class of dynamic choice rules: the dynamic consideration set rule. With axioms that constrain the intertemporal variations in choice probabilities, we show that the attention probabilities for each time period and the preferences are identifiable. We introduce variability in preferences in the above setting and characterize a class of dynamic attention based random utility models with identifiable parameters.

Talk 6 — Emre Dogan**Lawyer Assignment with Congestion: Redesigning the Comal County Pilot Program****Abstract:**

The U.S. system for assigning public lawyers to indigent defendants denies choice to manage congestion. A pilot program in Comal County, Texas, granting choice caused overcrowding among popular lawyers. We propose implementing efficient and mobility-free assignments where no defendant prefers to unilaterally switch lawyers. Such assignments always exist and, when feasible, match the unique envy-free allocation. While pilot's mechanism is obviously manipulable, no mobility-free mechanism is, and gains from manipulation are limited. We develop efficient and mobility-free congestion-cutting mechanisms and offer a practical design preserving choice while guaranteeing defendants prioritizing congestion-level over lawyer identity are never assigned to overburdened lawyers.

Day 2 — 9th October 2026**Talk 1 — Monica/Monika Arora****On modeling of count data****Abstract:**

In count data models, zero inflation is a common phenomena. The zero-inflated Poisson and zero-inflated negative binomial are used instead of Poisson and negative binomial in such scenarios. However, there are scenarios where along with zero there is another count value $k > 0$ that is also inflated. The zero and k -inflated count data models provide better fit to such datasets. This talk introduces these doubly inflated models, demonstrating their application and performance on real-world datasets. Additionally, we will briefly explore methods for handling load-sharing count data.

Talk 2 — Sankha Basu

Paraconsistency

Abstract:

Paraconsistency is a topic within the area of non-classical logics that deals with reasoning effectively in the presence of contradictions or inconsistencies. A paraconsistent logic is one that prevents every contradiction from blowing up into triviality. This talk will begin with some history and philosophy of paraconsistency. During and following these, I will point to various applications of paraconsistent systems in artificial intelligence, where one of the major challenges faced is in dealing with uncertain and inconsistent information. Finally, I will end with some of the directions in which my current research is focused.

Talk 3 — Dmitri Piontkovski

The Jacobian Conjecture and Non-Associative Structures

Abstract:

In July 2026, Levent Alpöge, with the assistance of AI, disproved the Jacobian conjecture by constructing a counterexample in three variables. Several related problems nevertheless remain open, including the two-variable case and an infinite-dimensional analogue for quadratic polynomial maps. These problems have natural formulations in terms of identities in commutative nonassociative algebras and, more generally, symmetric multilinear algebras. I will explain this correspondence and present an infinite-dimensional analogue of the Jacobian theorem: every Yagzhev nil (weakly nil) algebra is Engel, with an explicit bound on the Engel exponent. I will conclude with related results and open questions concerning the converse implication and related questions.

Talk 4 — Dmitry Shirokov / Ekaterina Filimoshina

On Lie Groups in Geometric Algebras and Applications to Equivariant Neural Networks

Abstract:

Geometric (Clifford) algebras provide a unified mathematical framework for Lie groups and algebraic groups associated with quadratic forms. The Clifford and Lipschitz groups consist of invertible elements of the Clifford algebra that preserve the underlying vector space under the adjoint and twisted adjoint actions; they are defined for arbitrary quadratic forms, both non-degenerate and degenerate. In the non-degenerate case, the Spin and Pin groups arise as distinguished subgroups that double cover the special orthogonal and orthogonal groups. In this talk, we explore these groups, their generalizations, and their applications to equivariant neural networks. We introduce Generalized Lipschitz Group Equivariant Neural Networks (GLGENN), a novel architecture based on geometric algebras that is equivariant to all pseudo-orthogonal transformations of a vector space with an arbitrary non-degenerate or degenerate symmetric bilinear form. By using a weight-sharing parametrization that respects the underlying algebraic

structures, GLGENN is parameter-light and less prone to overfitting than baseline equivariant models. We show that GLGENN matches or outperforms competitors on several benchmark equivariant tasks while using significantly fewer parameters.

Talk 5 — Manuj Mukherjee

Generalization Bounds for Dependent Data

Abstract:

In this talk, we discuss generalization bounds of statistical learning algorithms trained on samples drawn from a dependent data source both in expectation and with high probability, using the Online-to-Batch conversion paradigm. We show that the generalization error of statistical learners in the dependent data setting is equivalent to the generalization error of statistical learners in the i.i.d. setting up to a term that depends on the decay rate of the underlying mixing stochastic process, and is independent of the complexity of the statistical learner. Our proof techniques involve defining a new notion of stability of online learning algorithms based on Wasserstein distances, and employing "near-martingale" concentration bounds for dependent random variables to arrive at appropriate upper bounds for the generalization error of statistical learners trained on dependent data. Finally, we prove that the Exponential Weighted Averages (EWA) algorithm satisfies our new notion of stability, and instantiate our bounds using the EWA algorithm.