Российская экономическая школа (институт)

Лаборатория исследования социальных отношений и многообразия общества РЭШ

Программа

научной школы для молодых учёных и студентов ЛИСОМО РЭШ

«*Дизайн механизмов: новые продукты, новые рынки, новые модели*»

(в рамках проекта по гранту Российского научного фонда (проект №15-18-30081)

РЭШ, Сколково, 23–27 ноября 2015 года

23 ноября, понедельник

10:00–10:15 – Открытие школы:
и. о. ректора РЭШ, научный руководитель ЛИСОМО РЭШ профессор **Шломо Вебер**
заведующий ЛИСОМО РЭШ профессор **Сергей Измалков**

10:15–11:30 – Лекция **Сергея Измалкова** (РЭШ)
«*Введение в дизайн механизмов*»

12:00–13:30 – Лекция **Сергея Измалкова** (РЭШ)
«*Дизайн аукционов*»

15:00–16:30 – Лекция **Алексея Белянина** (НИУ ВШЭ)
«*Experimental approach to community-based policing*»

We discuss the stylized facts and peculiarities of the functioning of the Russian police at the era of reforms whose partial goal is to improve its efficiency and quality of police services provided to the citizens. One of the main engines of this improvement is meant to be an introduction of community-based policing (CBP), first at a level of precincts (beat cops). We analyze various aspects of CBP and its effect on police performance and citizens' welfare from the mechanism design perspective, characterise the proposed mechanism, and discuss some theoretical and practical difficulties with its implementation.

17:00–18:30 – Лекция **Натальи Капелько** (ЛИСОМО РЭШ)
«*Краудсорсинговые платформы для соревнований по анализу данных*»

Дефицит дата майнеров и аналитиков в области анализа данных привел к созданию краудсорсинговых платформ типа Kaggle.com, которые соединяют растущий спрос на задачи анализа и машинного обучения и онлайн предложение таких услуг от людей со всех концов земного шара. От имени компаний платформа проводит соревнования на лучшее решение аналитической задачи с использованием данных. Такие соревнования оказываются эффективными не только с точки зрения заказчика, но также приносят выгоду всем участникам соревнований. В лекции будет рассмотрено какие задачи решает заказчик, какие бывают правила соревнований, что является стимулом для участия в таких соревнованиях и какие эффективные техники используются для достижения максимального результата.

24 ноября, вторник

10:00–11:30 – Лекция **Сергея Степанова** (НИУ ВШЭ)
«*Extracting information from experts*»

Accurate information is crucial for taking right decisions. Yet, decision makers often fail to elicit useful information from parties possessing it. This lecture surveys the literature on information transmission that tackles the following questions: What prevents agents from sharing their private information with decision makers? What are the consequences of imperfect information transmission? How can this problem be alleviated?

The key literature references for this lecture are listed below. The basic model of "cheap talk" communication is presented in the seminal paper [2]. To those who do not feel familiar enough with this concept, I recommend reading [1] first, which is more accessible for an unprepared reader. The remaining references address various questions that we are going to touch upon during the lecture. [9] is a survey of the literature in the field.

Литература:

1. Gibbons R. (1992). *Game theory for applied economists*. Princeton University Press. Chapter 4, in particular 4.3A.
2. Crawford V. P., Sobel J. (1982). Strategic information transmission. *Econometrica*, 50(6), 1431-1451.
3. Farrell J., Gibbons R. (1989). Cheap talk with two audiences. *The American Economic Review*, 79(5), 1214-1223.
4. Krishna V., Morgan J. (2001). A Model Of Expertise. *The Quarterly Journal of Economics*, *116*(2), 747-775.
5. Morris S. (2001). Political correctness. *Journal of* Political *Economy*, *109*(2), 231-265.
6. Ottaviani M., Sørensen P. (2001). Information aggregation in debate: who should speak first?. *Journal of Public Economics*, *81*(3), 393-421.
7. Battaglini M. (2002). Multiple referrals and multidimensional cheap talk. *Econometrica*, 70(4), 1379-1401.
8. Dessein W. (2002). Authority and communication in organizations. *The Review of Economic Studies*, *69*(4), 811-838.
9. Sobel J. (2010, August). Giving and receiving advice. In *Econometric Society 10th World Congress*.

12:00–13:30 – Лекция **Валерия Топинского** (PulsePoint Inc.)
«*Real-time-bidding (RTB) auctions: practical challenges*»

Nowadays auctions became a popular way to sell something on Internet.

Real-time bidding platform is one example of this where every time an impression occurs the potential ad placements are auctioned off.

This market is comparatively large one: total RTB revenues only in the US reached $10.1 billions in 2014 (52% of total 2014 US display related advertising). According to the Interactive Advertising Bureau, RTB platforms usually run cpm second price auctions to sell their inventory. SPA is well studied model in theory, but RTB auction implementation has a lot of specific features which impact the resulting SPA properties. Often RTB platforms apply some heuristic updates to classic SPA rules, e.g. soft floor prices are pretty common phenomenon. All such updates and phenomena are not well studied yet.

In this talk I'm going to cover some issues that occur in the industry caused by the specific features of RTB. There are a few works from computer science field about developing optimal bidding strategies and adjusting optimal reserve prices. All these works exhibit some disconnect between objectives for intermediary companies and ultimate players from supply and demand sides. These uncoordinated objectives and their effects on incentives will be discussed.

In conclusion I will state a few challenges which from my point of view are very important for further developing of RTB industry.

15:00–16:30 – Лекция **Филиппо Балестриери** (Hewlett-Packard Laboratories, США)
«*Mechanism Design in an IT enterprise*»

In this talk we give an overview of projects that were developed at the Hewlett Packard Labs in the past few years. In particular, we will focus on how we applied mechanism design tools and concepts to improve business practice. We will provide examples to describe how mechanism design helped us both in solving critical business problems and in bringing new solutions to existence.

17:00–18:30 – Лекция **Константина Сорокина** (НИУ ВШЭ, ЛИСОМО РЭШ)
«*Механизмы, реализующие равновесие по Нэшу, а также их обобщения*» («Implementing Nash equilibrium and its refinements»)

В лекции рассматриваются возможность реализации (имплементации) правил коллективного выбора посредством равновесий Нэша в экономических механизмах. Обсуждается связь этого подхода с имплементацией через слабодоминирующие стратегии. Кроме того, рассматриваются возможность расширения класса реализуемых правил за счёт использования более узких классов равновесий, например, совершенных на подыграх.

Литература:

1. Maskin and Sjöström (2002). “Implementation Theory,” in Handbook of Social Choice and Welfare.

2. Mas-Collel, Whinston and Green (1995). Microeconomic Theory, chapter 23.

3. Maskin (1999). “Nash Equilibrium and Welfare Optimality” // Review of Economic Studies.

4. Moore and Repullo (1988). “Subgame Perfect Implementation” // Econometrica.

5. Abreu and Matsushim (1992). “Virtual Implementation in Iteratively Undominated Strategies” // Econometrica.

6. Muller And Satterthwaite (1977). The Equivalence of Strong Positive Association and Strategy-proofness // Journal of Economic Theory.

7. Dutta and Sen (1993). Implementing generalized Condorcet social choice functions via backward induction // Social Choice and Welfare.

25 ноября, среда

10:00–11:30 – Лекция **Алексея Захарова** (НИУ ВШЭ)
«*Design of Political Institutions*»

In this lecture I examine the interaction between various types of political regimes and economic and institutional outcomes. There is growing evidence that political institutions and economic performance are highly interdependent. In partucilar, I look at different types decisions that are made by political actors in non-democratic regimes, and how these decisions are shaped by various external and internal constraints.

12:00–13:30 – Лекция **Чечилии Зентено** (MGH и MIT, США)
«*OR in the OR (and beyond) at Massachusetts General Hospital*»

The traditional way of improving process efficiency in health care has been increasing capacity. In recent years, with the advent of the Affordable Care Act and health care reform, hospitals have started to shift their focus and are aiming to achieve greater efficiency with existing resources. In this talk we present a general overview of how Operations Research techniques are used to re-design and improve care processes at Massachusetts General Hospital (MGH) in collaboration with the Sloan School of Management at MIT. We describe some of the greatest operational challenges that the hospital is facing and how data-driven models can help clinicians and administrators to make more informed decisions.

We describe the implementation of data-driven scheduling strategies for elective and non-elective cases. First, we describe how we increased the effective capacity of the surgical general care units by rearranging the surgical block time with integer programming. We then outline how we used simulation to inform how much OR capacity to reserve in order to increase access for non-elective surgical patients while maintaining high utilization of expensive resources. If time allows, we will discuss an extension of this approach to provider scheduling in the largest primary care practice at MGH.

15:00–16:30 – Лекция **Алексея Парахоняка** (Оксфордский университет)
«*Consumer Search*»

The purpose of this talk is to give an overview classical approaches to modeling consumer markets with search frictions. We look how introduction of search frictions changes market outcomes from perfectly competitive to monopolistic ones. Then we are going to look how price dispersion naturally arises in markets with search frictions, and how pricing behaviour of the firms is affected by search protocol and distribution of search costs. This talk can be viewed as an extended introduction to my research presentation.

17:00–17:45 – Семинар **Алексея Парахоняка** (Оксфордский университет)
«*Non-reservation price equilibria and consumer search*»

This paper studies an infinite-horizon bilateral bargaining model with alternating offers and private correlated values. The paper characterizes frequent-offer limits of common screening equilibria in which both parties make offers to screen the opponent’s type, and all types of either party follow the same path of offers. Even in the limit when the correlation of values is nearly perfect, common screening equilibria exhibit two-sided screening dynamics and involve inefficient delay in contrast to the unique equilibrium outcome of the completeinformation bargaining game. Segmentation equilibria, in which types partially separate themselves into segments by the initial offer, are also constructed. Most of the types in the segments

trade in the first rounds, while types near the boundaries of the segments delay trade to convince the opponent that they belong to a segment with more favorable terms of trade. Segmentation equilibria are efficient in the limit as the correlation of values becomes nearly perfect, and establish the connection between the limit outcome of nearly perfect correlation and the complete information outcome. The paper introduces a refinement that rules out non-trivial segmentation equilibria, and in the limit as correlation becomes perfect, the refinement selects from the set of frequent-offer limits of common screening equilibria a limit with an equal division of the realized surplus.

17:45–18:30 – Семинар **Антона Цоя** (Einaudi Institute for Economics and Finance, Италия)
«*Auction Design with Advised Bidders*»

This paper studies efficient and optimal auction design where bidders do not know their values, but solicit advice from informed advisors via a cheap-talk game. When advisors are biased toward overbidding, we characterize equilibria of static auctions and the English auction satisfying the dynamic version of the NITS condition (Chen, Kartik and Sobel (2008)). In all equilibria of static auctions, advisors transmit a coarsening of their information and a version of the revenue equivalence holds. In contrast, in the English auction, information is transmitted perfectly from types in the bottom of the distribution, and pooling happens only at the top. The English auction dominates any static auction in terms of both efficiency and the seller's revenue. The distinguishing feature of the English auction is that bidders cannot submit bids below the current price of the auction. This results in a higher efficiency due to better information transmission and allows the seller to extract additional profits from the overbidding bias of advisors. When advisors are biased toward underbidding, there is an equilibrium of the Dutch auction that is more efficient than any equilibrium of any static auction, but it can bring lower expected revenue.

26 ноября, четверг

10:00–11:30 – Лекция **Антона Суворова** (НИУ ВШЭ)
«*Intrinsic and Extrinsic motivation in contracting*»

12:00–12:45 – Семинар **Антона Суворова** (НИУ ВШЭ)
«*Building identity and giving money: too much of a good thing?*»

Using monetary incentives and creating group identity, when used separately, may improve group performance. But, when these instruments are combined, do they reinforce or substitute each other? We address this question in a lab experiment. Our results show that, while separately monetary stimuli and group identity indeed substantially increase cooperation in a public good game, their combination does not produce additional gains: these instruments act as substitutes in our set-up. We argue that this result can be due to motivation crowding-out effects. In addition, we explore the channels through which group identity increases cooperation. In particular, contrary to previous studies, we show that building identity boosts group members' expectations regarding future cooperation, which, in turn, improves their own willingness to cooperate.

12:45–13:30 – Семинар **Алексея Парахоняка** (Оксфордский университет)
«Non-Reservation Price Equilibria and Search Without Priors»

In this paper we analyse a model of oligopolistic competition in which consumers search without priors. Consumers do not have prior beliefs about the distribution of prices charged by firms and thus try to use a robust search procedure: they minimise the loss relative to the searcher, who knows the price distribution, in the worst case scenario. We derive the optimal stopping rule and show that it does not possess the reservation price property. This means that for a range of prices for which consumers stop searching with a probability strictly between zero and one. We show that for any distribution of search costs there is a unique market equilibrium characterised by price dispersion. Therefore search without priors helps resolve the famous Diamond (1971) paradox. We show that although listed prices approach the monopoly price as the number of firms increases, the effective price paid by consumers does not depend on the number of firms. We show that prices in our model are lower than those in a model where consumers know the distribution of prices. The reason is that consumers actively search in equilibrium, and this pushes prices down. This effect is so strong that the price decrease more than compensates consumers for their extra search costs.

15:00–16:30 – Лекция **Антона Цоя** (Einaudi Institute for Economics and Finance, Италия)
«*Liquidity and Prices in Over-the-Counter Markets*»

Many important asset markets are decentralized. Examples include over-the-counter (OTC) markets for commercial and residential real estate, asset-backed securities, derivatives, corporate and municipal bonds, credit-default swaps, private equity, sovereign debt and bank loans. Unlike in centralized exchanges, in such markets there are no market prices at which assets can be freely bought and sold. Instead, asset prices are determined via bilateral bargaining. Thus, not only the price, but also the time it takes parties to find each other and agree on this price are important dimensions of market transactions.

In this lecture, we develop a dynamic equilibrium model of decentralized asset markets with both search delays and endogenous bargaining delays arising in the limit of almost public information about the asset quality. The model has several

implications for liquidity and prices. First, conditional on the public information, the liquidity is U-shaped in the quality and assets in the middle of the quality range may not be traded at all. Second, search and bargaining frictions have opposite effects on the market liquidity showing that transparency, while welfare improving, may also hurt the market liquidity. Third, the substitutability of different asset classes leads to flights-to-liquidity during periods of market uncertainty and reveals adverse effects of gradual transparency policies. Finally, we look at the effect of asset liquidity, market liquidity and market tightness on asset prices.

17:00–18:30 – Лекция **Диляры Хакимовой** (ЛИСОМО РЭШ)
«*Recommender systems*»

В мире переполненном информацией рекомендательные системы помогают людям находить интересные им товары, музыку, фильмы, новостные статьи, рестораны, да и просто принимать «правильные» потребительские решения. Рекомендательные системы -одна из самых активно развивающихся областей Computer Science. Какие методы используются для построения рекомендательного алгоритма? Как создать «хорошую» рекомендательную систему, отвечающую потребностям пользователя? Как оценивать экономическую эффективность рекомендательных систем? Эти и другие вопросы будут освещены в докладе.

27 ноября, пятница

10:00–11:30 – Лекция **Елены Пальцевой** (SITE, Stockholm School of Economics, Швеция)
«Petro Rents, Political Institutions, and Hidden Wealth: Evidence from Offshore Bank Accounts»

Do political institutions limit rent-seeking by politicians? We study the transformation of petroleum rents, almost universally under direct government control, into hidden wealth using unique data on bank deposits in offshore financial centers known to offer secrecy and asset protection to foreign customers. We find that plausibly exogenous shocks to petroleum income are associated with increases in hidden wealth, but only when institutional checks and balances are weak. We find only very limited evidence that shocks to other types of income not directly controlled by governments affect hidden wealth.

12:00–12:45 – Семинар **Константина Сорокина** (НИУ ВШЭ, ЛИСОМО РЭШ)
«*Comparative statics in common value auctions and beyond*»

The research obtains comparative statics of auction outcome with respect to the distribution of bidder's types. The variation of distribution is modeled by different notions of stochastic orders, both univariate (independent types) and multivariate (interdependent types). The main results hold for generalized auction model, which also includes such cases as war of attrition, escalation of conflict and all-pay auction.

Auction theory has long been a benchmark of successful mechanism design story, boasting both advanced theoretical results and impactful real-world applications. The majority of literature concentrates on finding an optimal mechanism given the environment, however, the question what happens if the mechanism remains the same while the environment changes is almost ignored – our paper aims to address this issue.

12:45–13:30 – Семинар **Чечилии Зентено** (MGH и MIT, США)
«*Strategic Block Scheduling Optimization in Large Academic Medical Centers*»

In this talk we describe a data-driven online scheduling algorithm that aims at generating a more predictable and balanced intra-day resource utilization in a 60-chair Infusion Unit at the Massachusetts General Hospital (MGH) Cancer Center. This work is motivated by the unit's uneven utilization throughout the day: it suffers acute midday congestion, while it is underutilized during other business hours. The algorithm is based on a combination of integer optimization and simulation techniques; it incorporates all the relevant operational and clinical constraints that describe the Cancer Center's complex patient flow. The projected impact of the implementation of the algorithm is a 30% reduction in the peak's average utilization, and a 35% reduction in its standard deviation. The hospital is currently in the process of contracting with an external vendor to implement this algorithm into a customized IT tool. This work is part of a 9-year long collaboration between the Perioperative Department at MGH and MIT Sloan School of Management.

15:00–15:45 – Семинар **Филиппо Балестриери** (Hewlett-Packard Laboratories, США)
«*Output-based provisioning of Cloud Services*»

Cloud services are sold today according to a resource-based model, in which customers pay per instance per unit time. New technologies for prediction of job requirements and completion times allow Cloud providers to consider new business models. We compare the performance of resource-based Cloud business model to a results-based mechanism, in which the provider offers a menu of completion times and prices to each customer for his specific job. We identify conditions under which one mechanism produces higher revenue for the provider than the other.

15:45–16:30 – Семинар **Левента Челика** (НИУ ВШЭ)
«*Product line design*»

We characterize the product line choice and pricing of a monopolist from the upper envelope of net marginal revenue curves to the individual product demand functions. The equilibrium product line constitutes those varieties yielding the highest upper envelope. In a generalized vertical differentiation framework, the equilibrium line is exactly the same as the first-best socially optimal line. These upper envelope and first-best optimal line findings extend to symmetric Cournot oligopoly.

17:00–17:45 – Семинар **Сергея Измалкова** (РЭШ)
«*Auctions with quantity externalities*»

We consider a multi-object private values setting with quantity externalities: a value to a bidder from an object may depend on the total number of objects sold. For example, the likelihood a customer will respond to an advertisement is higher the fewer other advertisements are shown; a spectrum license is more valuable the fewer licenses are being allocated. We raise and solve the problem of finding revenue maximizing and efficiently allocating auctions in such a setting. We show that both optimal and efficient auctions have the property that the quantity of objects sold depends non-trivially on the whole profile of players' valuations. That is, the optimal quantity is determined endogenously, within the auction. We demonstrate that auctions currently used for allocating advertising positions are suboptimal and offer simple designs that can implement (or approximate) optimal and efficient auctions under quantity externalities.

17:45–18:30 – Обсуждение исследований и закрытие научной школы

Все занятия будут проходить в к. 2.53 корпуса «Сколково-Урал» (кампус РЭШ в Сколково: Москва, Сколково, ул. Новая д.100а)

Перерывы:

11:30–12:00 – Перерыв на чай и кофе (к. 2.52)

13:30–15:00 – Перерыв на обед

16:30–17:00 – Перерыв на чай и кофе (к. 2.52)

Утренний шаттл отправляется в Сколково от остановки общественного транспорта м. «Славянский бульвар» (*последний вагон из центра, при выходе после турникетов через стеклянные двери направо*) в **9:15**.

Вечерний шаттл уезжает из Сколково до остановки общественного транспорта м. «Славянский бульвар» – в **19:00**.