

July 2022

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**Research interests:** (research statement (2019): [link](#))

- **Areas:** microeconomic theory, information economics, economic design, fair division, algorithmic game theory, dynamic games
- **Methods:** probability theory, majorization theory, duality, and optimal transport

**Experience:**

- 2021—2023, **Caltech** (USA):
  - postdoc at [Linde institute](#) hosted by Omer Tamuz
- 2018—2021, **Technion** (Israel):
  - postdoc at [Game Theory group](#) (dept. of Industrial Engineering and Management)
  - member of [Mechanism Design for Data Science group](#) of Moshe Tennenholtz
- 2015—2022, **National Research University Higher School of Economics** (Russia):
  - senior researcher (remote since 2018) at [International Laboratory of Game Theory and Decision Making](#) of Herve Moulin and Anna Bogomolnaia
  - head of the laboratory (2017—2018)
- 2012-2015, **St.Petersburg State University, dept. of Mathematics and Mechanics** (Russia):
  - researcher at [Chebyshev Laboratory](#) of Stanislav Smirnov

**Education:**

- **Economics & Game-theory:**
  - **Ph.D.** (Candidate of Sciences) in **math. methods of economics**, 2014,  
Central Economics and Mathematics Institute, Russian Academy of Sciences  
Thesis: “The value of information in repeated games”  
Advisers: Victor Domansky, Ernst Presman
- **Mathematics:**
  - **Master Degree in Mathematical Physics**, 2011,  
Department of physics, St.Petersburg State University

## Papers:

### Working papers:

- [Private private information](#) (with Kevin He and Omer Tamuz)  
featured at **EC'22**  
[slides](#) (EC'22)
- [Persuasion as transportation](#) (with Itai Arieli and Yakov Babichenko)  
featured at **EC'22**  
[slides](#) (EC'22)
- [Beckmann's approach to multi-item multi-bidder auctions](#) (with Alexander Kolesnikov, Aleh Tsyvinski, and Alexander P. Zimin)  
[slides](#) (Bonn)
- [Bayesian persuasion with mediators](#) (with Itai Arieli and Yakov Babichenko)
- [Efficiency in random resource allocation and social choice](#) (with Federico Echenique and Joseph Root)
- [On social networks that support learning](#) (with Itai Arieli and Rann Smorodinsky)  
**R&R in *Journal of Economic Theory (JET)***, featured at **EC'21**  
[slides](#) (Cornell), [talk](#) (CMID2020)
- [Algorithms for competitive division of chores](#) (with Simina Brânzei)  
**R&R in *Mathematics of Operations Research***  
[slides](#) (Tel-Aviv CS)

### Main publications:

- [Feasible joint posterior beliefs](#) (with Itai Arieli, Yakov Babichenko, and Omer Tamuz)  
*Journal of Political Economy (JPE)*, 2021, 129(9)  
**EC2020 best paper award** ([link](#))  
[slides](#), [EC talk](#), [poster](#), [1min talk](#)  
[popular version](#) published in **SIGecom Exchanges**
- [Competitive division of a mixed manna](#) (with A. Bogomolnaia, H. Moulin, E. Yanovskaya)  
*Econometrica*, 2017, 85(6):1847-1871  
[slides](#) (HUJI)
- [A simple online fair division problem](#) (with Anna Bogomolnaia and Herve Moulin)  
*Management Science*, 2022, 68(2):1174-1194  
[slides](#) (URochester)
- [Fair division with minimal sharing](#) (with Erel Segal-Halevi)  
*Operations Research*, 2022, 70(3):1293-1952,  
[slides](#) (Caltech)

### Other publications:

- [Representative Committees of Peers](#) (with Reshef Meir and Moshe Tennenholtz)  
*Journal of Artificial Intelligence Research (JAIR)*, 2021, 71:401–429
- [Protecting the protected group: circumventing harmful fairness](#) (with Omer Ben-Porat and Moshe Tennenholtz)  
**proceedings of *AAAI-21*** (The Thirty-Fifth AAAI Conference on Artificial Intelligence), 2021
- [A polynomial-time algorithm for computing a Pareto optimal and almost proportional allocation](#) (with Haris Aziz and Herve Moulin)  
*Operations Research Letters*, 2020, 48(5):573-578

- [Dividing bads under additive utilities](#) (with A. Bogomolnaia, H. Moulin, E. Yanovskaya)  
*Social Choice and Welfare*, 2019, 52(3):395-417
- [On repeated zero-sum games with incomplete information and asymptotically bounded values](#)  
*Dynamic Games and Applications*, 2018, 8(1):180-198
- [Repeated games of incomplete information with large sets of states](#)  
*International Journal of Game Theory*, 2014, 43(4):767-789
- [An exact renormalization formula for the Maryland model](#) (with Alexander Fedotov)  
*Communications in Mathematical Physics*, 2015, 334(2):1083-1099
- Variation of measure-valued martingales and repeated games with incomplete information  
*Doklady Mathematics* (English translations of Proceedings of the Russian Academy of Sciences), 2012, 86:796-798

## Additional training:

- 2015-2017: **Advanced training in Computer Science** at CS center in St.Petersburg  
specialization: theoretical computer science  
Programming skills: C++, Matlab/Octave, Python
- **Summer schools:**
  - COST IC1205 Summer School on Computational Social Choice (San Sebastian, 2016)
  - The 28th Jerusalem School in Economic Theory: mechanism design (2017)
  - The Workshop on soft skills for teaching and research by William Thomson (2018)
  - The 3rd Jerusalem School in Computer Science and Engineering on Blockchains and Cryptocurrencies (2018)
  - Schools on computational aspects of fair division (organizer, see below)

## Teaching and supervision (teaching statement: [link](#))

- **Courses taught**
  - Algorithmic Economics (CS/SS/EC149), Caltech, 2021, [detailed lecture notes](#)
    - \* developed from scratch 20-lecture introduction to modern economic Design for grads & undergrads with CS & Math background
  - “Games with incomplete information and information design,” minicourse co-taught with Rann Smorodinsky, Technion, 2020
  - “Introduction to mechanism design,” a course developed and co-taught with Alexander Nesterov, Higher School of Economics, 2017
  - practice in Probability, Calculus 1, Algebra 1, St.Petersburg State University, 2013-2014
- **Tutorials and surveys**
  - “Methods of Optimal Transport in Bayesian Persuasion & Auctions,” HSE 2021, [slides](#)
  - “One open problem in Bayesian communication,” open problem session at “Dynamics and Information Workshop,” TAU, 2020, [slides](#)
  - “Appeal and challenges of competitive approach to fair resource allocation” tutorial co-taught with Vasilis Gkatzelis at “De Aequa Divisione” workshop on fair division, LUISS, 2019, [my slides](#)
  - “Modern approaches to Fair Division”, a tutorial at “Imperfect Markets: Collusion, Networks, and Crowdfunding” workshop, New Economic School, 2017

- **Supervision, mentorship, and outreach**

- Mentor at “Mentorship workshop”, EC’22
- Supervisor
  - \* Egor Kravchenko (math dept. SPbSU), undergrad project “Belief covariance: tight bounds”, 2022
  - \* Yulia Ibragimova (HSE)
    - undergrad thesis “Competitive market mechanisms for fair division of indivisible goods”, featured at COMSOC 2016
    - master thesis “Online Procurement Auctions up to 500 Thousand Rubles: Participants Behavior Patterns at Micro and Macro levels”, 2018
  - \* Alisa Maricheva (HSE), master thesis, “Fair division of indivisible goods with or without money transfers”, 2018
- Committee member at Ph.D. defense of Zijian Tao, Caltech, 2022
- Gave multiple series of popular lectures on Game Theory and Economic Design for undergrads and gifted secondary-school students (2015-2018)

## Service

- **Program committee** of EC’19, EC’ 20, EC’21, EC’22 (ACM Conferences on Economics and Computation), WINE 2021 (Conference on Web and Internet Economics)
- **Organizing and program committee of conferences**
  - “New Directions in Social Choice in St. Petersburg”, HSE, 2021
  - “Economic Design and Algorithms in St.Petersburg”, HSE, 2019
  - “Algorithmic aspects of Social Choice and Auctions”, HSE, 2018
  - “Advances in Fair Division”, August 9-11, HSE, 2017
  - “Game Theory and Mechanism Design”, in memory of Victor Domansky, HSE, 2016.

### and schools

- “Game Theory: Applications, Networks, Emotions”, HSE, 2019
- “Computational Social Choice and Fair Division”, HSE, 2016
- “Fair Division: Between Economics, Mathematics and Computer Science”, HSE, 2017
- **Russian Game Theory Olympiad**: organizing (2018) and program committee (2018–2021)
- **Victoria Kreps memorial prize** for young game theorists and theoretical economists: organizing and award committee.
- **Reviewing for** Journal of Economic Theory, Theoretical Economics, Games and Economic Behavior, American Economic Journal: Microeconomics, Economic Theory, Social Choice and Welfare, Mathematics of Operations Research, European Journal of Operations Research, German-Israeli Foundation for Scientific Research and Development, Israel Science Foundation, STOC 2019, SODA 2020

## Grants and awards

- **Grants where I was the principal investigator**

- RFBR 19-01-00762, “Cardinal mechanisms for resource allocation”
- RFBR 16-01-00269, “Asymptotic problems of game theory”

- RFBR 13-01-00462, “Game-theoretic analysis of multistage social and economic interactions with asymmetrically informed agents and variability of beliefs during Bayesian learning”

- **Awards**

- B.L. Ovsievich prize (2013) for research on repeated games with incomplete information
- V. Deych fund prize (2009) for outstanding undergrad thesis in mathematical physics
- 2008-2011: Several prizes (from first to third), Annual Math Olympiad for Russian students

## Consulting & applied projects

bidding strategy in procurement auctions, incentives in block-chain technologies, payment design at crowd-sourcing platforms, artificial intelligence for automatic collusion/corruption detection

## Visits

- University of Chicago, Econ. dept, hosted by Joseph Root, February 2022
- Stanford MS&E, hosted by Itai Ashlagi, December 2019
- Caltech (California Institute of Technology), hosted by Omer Tamuz, December 2019
- University of Rochester, hosted by William Thomson, September 2018
- University of Glasgow, hosted by Herve Moulin and Anna Bogomolnaia, Jan. 2016 and Feb. 2017
- Hebrew University of Jerusalem, hosted by Avi Shmida, November 2017

## References

**Omer Tamuz**  
(Caltech)  
[homepage](#)

**Federico Echenique**  
(Caltech)  
[homepage](#)

**Herve Moulin**  
(U.Glasgow)  
[homepage](#)

**Aleh Tsyvinski**  
(Yale)  
[homepage](#)