GUSTAV KARRESKOG

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STOCKHOLM SCHOOL OF ECONOMICS

Placement Officer	Tore Ellingsen	tore.ellingsen@hhs.se	+46 (0) 8 736 92 60
Placement Officer	Abhijeet Singh	abhijeet.singh@hhs.se	+46 (0) 8 736 92 63

Education

2015–2021 **DOCTOR OF PHILOSOPHY IN ECONOMICS**
Stockholm School of Economics
Primary supervisor: Prof. Jörgen Weibull
Secondary supervisor: Assoc. Prof. Erik Mohlin

References

Prof. Jörgen Weibull
Dept. of Economics, SSE
jorgen.weibull@hhs.se

Prof. Drew Fudenberg
Dept. of Economics, MIT
drewf@mit.edu

Assoc. Prof. Erik Mohlin
Dept. of Economics, Lund University
erik.mohlin@nek.lu.se

Assoc. Prof. Mark Voorneveld
Dept. of Economics, SSE
mark.voorneveld@hhs.se

2014–2015 **M.SC. IN ECONOMICS**
Stockholm School of Economics
Unfinished due to admittance to the PhD program

2012–2014 **M.SC. IN MATHEMATICS**
Stockholm University

2010–2012 **B.SC. IN MATHEMATICS**
Stockholm University

Research Visits

2018–2019 **Dept. of Economics, Massachusetts Institute of Technology**
Faculty Sponsor: Prof. Drew Fudenberg

Teaching and Research Fields

FIELDS Microeconomic Theory, Behavioral Economics, Experimental Economics

TOPICS Machine Learning, Bounded Rationality, Learning in Games

Working Papers

"Rational Heuristics for One-Shot Games"
with Frederick Callaway and Thomas L. Griffiths **[Job Market Paper]**

"Learning about Initial Play Determines Average Cooperation in Repeated Games"
with Drew Fudenberg

"Stochastic Stability of a Recency Weighted Sampling Dynamic"
with Alexander Aurell

Ongoing projects

"Cue Based Decision Making and Context Effects"
with Benjamin Mandl

"Estimation of Learning Models Using Approximate Bayesian Computation"

Journal Publication in Mathematics

"Schrödinger operators on graphs: symmetrization and Eulerian cycles"
Proceedings of the American Mathematical Society, 144, (2016)
with Isak Trygg Kupersmidt and Pavel Kurasov

Research Grants and Awards

2017 Tom Hedelius Scholarship for research visit to MIT.

2014 Scholarship for excellent Master Thesis from Mittag-Leffer's fund.

Teaching

Stockholm School of Economics
2020 TA: Global Challenges - Undergraduate course
2017 TA: Economics of Organization - Undergraduate course
2016,2017 Math summer camp - Preparatory math class for incoming Ph.D. students
2016,2017 TA: Mathematics I - Introductory mathematics for Ph.D. students
2016 TA: Advanced Microeconomics - Advanced level course on microeconomic theory

2012–2015 **Amanuensis**, Dept. of Mathematics, Stockholm University
Primarily teaching assistant in undergraduate mathematics. I also developed (designed and coded) a web-platform for a large distance course in preparatory mathematics.

Presentations outside of SSE

2021 Games, 6th World Congress of the Game Theory Society, Budapest (upcoming)
2020 Nordic Exchange, NHH; SUDSWEC, Uppsala; ENTER/SWIPS, UCL
2019 Phd Math Fest, Stockholm; SING 15, Turku; Theory Lunch, MIT
2018 Theory Lunch, MIT

Other Skills

Languages
Swedish (native), English (fluent), Spanish (fluent)

Programming
Julia, Python, R, Web Development (HTML, CSS, javascript, SQL, basic linux server administration etc.), and workable knowledge in many more such as STATA, Matlab, Mathematica and Java.

Abstracts of selected papers

Job Market Paper

"Rational Heuristics for One-Shot Games"
with Frederick Callaway and Thomas L. Griffiths (Dept. of Psychology, Princeton University)

Work in behavioral economics suggests that perfect rationality is an insufficient model of human decision making. However, the empirically observed deviations or biases vary substantially between environments. There is, therefore, a need for theories that can tell us when and how we should expect deviations from rational behavior. We suggest that such a theory can be found by assuming optimal use of limited cognitive resources. In this paper, we present a theory of human behavior in one-shot interactions based on the rational use of heuristics. We test our theory by defining a broad family of heuristics for one-shot games and associated cognitive cost functions. In a large, preregistered experiment, we find that behavior is well predicted by our theory, which yields better predictions than existing models. We find that the participants' actions depend on their environment and previous experiences, in the way predicted by the rational use of heuristics.

Working Papers

"Learning about Initial Play Determines Average Cooperation in Repeated Games"
with Drew Fudenberg (Dept. of Economics, MIT)

We propose a simple learning model to make out of sample predictions of cooperation rates across treatments in the experimental play of the indefinitely repeated prisoner's dilemma. Although the model has only 4 parameters, it performs almost as well as more complicated models and machine learning algorithms. We find that learning has the most effect on choices in the initial round of each supergame, and that whether cooperation rises or falls in the course of a session depends on the way the initial choices in a supergame determine play in subsequent rounds. Our results also explain past findings on the impact of the risk dominance considerations.

"Stochastic Stability of a Recency Weighted Sampling Dynamic"
with Alexander Aurell (Operations Research and Financial Engineering, Princeton University)

It is common to model learning in games so that either a deterministic process or a finite state Markov chain describes the evolution of play. Such processes can however produce undesired outputs, where the players' behavior is heavily influenced by the modeling. In simulations we see how the assumptions in (Young, 1993), a well-studied model for stochastic stability, lead to unexpected behavior in games without strict equilibria, such as Matching Pennies. The behavior should be considered a modeling artifact. In this paper we propose a continuous-state space model for learning in games that can converge to mixed Nash equilibria, the Recency Weighted Sampler (RWS). The RWS is similar in spirit Young's model, but introduces a notion of best response where the players sample from a recency weighted history of interactions. We derive properties of the RWS which are known to hold for finite-state space models of adaptive play, such as the convergence to and existence of a unique invariant distribution of the process, and the concentration of that distribution on minimal CURB blocks. Then, we establish conditions under which the RWS process concentrates on mixed Nash equilibria inside minimal CURB blocks. While deriving the results, we develop a methodology that is relevant for a larger class of continuous state space learning models.