LIST OF ABSTRACTS 2018

2018/01

Soft clustering by convex electoral model

Yu. Nesterov

In this paper, we suggest a new technique for soft clustering of multidimensional data. It is based on a new convex voting model, where each voter chooses a party with certain probability depending on the divergence between his/her preferences and the position of the party. The parties can react on the results of polls by changing their positions. We prove that under some natural assumptions this system has a unique fixed point, providing a unique solution for soft clustering. The solution of our model can be found either by imitation of the sequential elections, or by direct minimization of a convex potential function. In both cases, the methods converge linearly to the solution. We provide our methods with worst-case complexity bounds. To the best of our knowledge, these are the first polynomial-time complexity results in this field.

Keywords: Soft clustering, fuzzy clustering, C-means, polynomial-time complexity bounds,electoral models

2018/02

Equilibrium selection and stability in dynamic core-periphery models with heterogeneous preferences

Justin Delloye, Dominique Peeters and Joe Tharakan

In New Economic Geography, recent models have shown that idiosyncratic preferences of workers for locations act as a dispersion force affecting the number and stability of equilibrium population distributions. Yet those models are based on ad hoc deterministic adjustment procedures that have two shortcomings. Firstly, they remove the aggregate effect of idiosyncratic preferences on the collective spatial dynamics of workers, whose study would require the use of specific notions of equilibrium stability. Secondly, these adjustment dynamics lack an explicit time unit that prevents adjustment trajectories to be expressed as dynamic scenarios. Those two shortcomings strive against the use of New Economic Geography models to support policy recommendations. Starting from a classic core-periphery model of New Economic Geography, this paper proposes a novel approach to adjustment dynamics, based on stochastic migration models, by which the dynamics of the population distribution is a continuous-time Markov chain. Using a diffusion approximation, the dynamic system is reduced to a set of Itô stochastic differential equations, which is an original contribution to New Economic Geography. In those equations, deterministic and stochastic effects are still distinct at the aggregate scale, which enables to numerically compute equilibrium population distributions as well as to evaluate their stability and selection under stochastic perturbations generated by idiosyncratic preferences. Those equations also enable to complete expected adjustment trajectories with an explicit time unit and with confidence intervals, for different scenarios. Hence this paper is a substantial improvement of the capacity of New Economic Geography models to support policy recommendations.

Keywords: agglomeration, migration, wage differential, heterogeneous agents
JEL Classification: F12, F15, F21, R12, R13, O15, O18

2018/03

Subjective expected utility with state-dependent but action/observation-independent preferences

Jacques H. Drèze

Under state-dependent preferences, probabilities and units of scale of state-dependent utilities are not separately identified, in standard models: only their products matter to decisions. Separate identification has been studied under implicit actions (Drèze 1961, 1987) or under explicit actions and observations (Karni 2011, 2013). This paper complements both approaches and relates them, when conditional preferences for final outcomes are independent of actions and observations. That special case permits drastic technical simplification while remaining open to some natural extensions.

Keywords: expected utility, state-dependent preferences, subjective probability
JEL Classification: D81

2018/04

Heterogeneity in the tax pass-through to spirit retail prices: Evidence from Belgium

Jean Hindriks and Valerio Serse

On 1st November 2015, the Belgian government increased the excise tax on alcoholic beverages. For spirits with 40% of alcohol and bottle size of 70cl, this tax change is equivalent to an amount of 2,43€ per bottle of spirits. This paper studies the impact of this tax reform on the retail price of six major brands of spirits, using a difference-in-differences method. The estimation is based on a balanced panel of scanner data from a major supermarket chain and uses the retail prices of the same brands sold in France by the same supermarket chain as a control group. Having information on each store geographical location, we can further test for heterogeneity in tax pass-through according to the intensity of local competition and the scope for cross-border shopping. We find that the tax was quickly passed through spirit retail prices already during the first month of tax implementation and that it was mostly over-shifted. Unlike the (nearly) uniform pricing in US retail chains, we show spatial variation in prices across stores, and we find a large heterogeneity in tax pass-through linked to variation in local competition and price elasticity of demand. Although the tax reform has considerably increased the relative price of Belgian spirits with respect to all its neighboring countries, we find a lower tax shifting only in stores bordering on Luxembourg. Which is the neighboring country with the lowest spirit prices before the alcohol tax reform. These findings have important implications for alcohol control policies as they highlight the risk that the health benefits of alcohol taxation can vary greatly across households according to where they live.

Keywords: tax pass through, scanner data, competition, cross border shopping
JEL Classification: H2, H22, H32, H71, I18

2018/05

Implementable tensor methods in unconstrained convex optimization

Yurii Nesterov

In this paper we develop new tensor methods for unconstrained convex optimization, which solve at each iteration an auxiliary problem of minimizing convex multivariate polynomial. We analyze the simplest scheme, based on minimization of a regularized local model of the objective function, and its accelerated version obtained in the framework of estimating sequences. Their rates of convergence are comapred with the worst-case lower complexity bounds for corresponding problem classes. Finally, for the third-order methods, we suggest an efficient technique for solving the auxiliary problem, which is based on the recently developed relative smoothness condition. With this elaboration, the third-order methods become implementable and very fast. The rate of convergence in terms of the function value for the accelerated third-order scheme reaches the level $O(1/k^4)$, where k is the number of iterations. This is very close to the lower bound of the order $O(1/k^5)$, which is also justified in this paper. At the same time, in many important cases the computational cost of one iteration of this method remains on the level typical for the second-order methods.

Keywords: high-order methods, tensor methods, convex optimization, worst-case complexity bounds, lower complexity bounds

2018/06

An age-differentiated tax on bequests

Pierre Pestieau and Gregory Ponthiere

Although fiscal systems around the world tax bequests at rates that do no explicitly depend on the age of the deceased, there exist several theoretical reasons to use that observable characteristic to differentiate the tax rate on bequests. This paper presents four arguments supporting an age-differentiated tax on bequests, that is, a tax rate on bequests that is varying with the age of the deceased. A first argument, which relies on the standard utilitarian criterion, supports a tax rate decreasing with the age of the deceased on the grounds that, as age increases, the accidental (inelastic) component of bequests declines, making taxation less desirable on efficiency grounds. However, three other arguments - avoiding influence of the tax on testamentary dispositions, compensating the unlucky short-lived and redistributing towards orphans in need - all support a tax rate on bequests increasing with the age of the deceased.

Keywords: bequest, taxation, age discrimination, mortality
JEL Classification: H21, H23

2018/07

Finite sample theory and bias correction of maximum likelihood estimators in the EGARCH model

Antonis Demos and Dimitra Kyriakopoulou

We derive analytical expressions of bias approximations for maximum likelihood (ML) and quasi-maximum likelihood (QML) estimators of the EGARCH(1,1) parameters that enable us to correct after the bias of all estimators. The bias correction mechanism is constructed under the specification of two methods that are analytically described. We also evaluate the residual bootstrapped estimator as a measure of performance. Monte Carlo simulations indicate that, for given sets of parameters values, the bias corrections work satisfactory for all parameters. The proposed full-step estimator performs better than the classical one and is also faster than the bootstrap. The results can be also used to formulate the approximate Edgeworth distribution of the estimators.

Keywords: exponential GARCH, maxmimum likelihood estimation, finite sample properties, bias approximations, bias correction, Edgeworth expansion, bootstrap
JEL Classification: C13, C22

2018/08

The inherited inequality: How demographic aging and pension reforms can change the intergeneraitonal transmission of wealth

Justina Klimaviciute, Harun Onder and Pierre Pestieau

The role of inherited wealth in modern economies has increasingly come under scrutiny. This study presents one of the first attempts to shed light on how demographic aging could shape this role. It shows that, in the absence of retirement annuities, or for a given level of annuitization, both increasing longevity and decreasing fertility should reduce the inherited share of total wealth in a given economy. Thus, aging is not likely to explain a recent surge in this share in some advanced economies. Shrinking retirement annuities, however, would offset and potentially reverse these effects. The paper also shows that individual bequests will be more unequally distributed if aging is driven by a drop in fertility. In comparison, the effect of increasing longevity on their distribution is non-monotonic.

Keywords: interited wealth, inheritance, aging, inequality, social security
JEL Classification: D14, D31, D64, D91, E21, H55, J11

2018/09

Nonlinearities and regimes in condiitonal correlations with different dynamics

Luc Bauwens and Edoardo Otranto

New parameterizations of the dynamic conditional correlation (DCC) model and of the regime-switching dynamic correlation (RSDC) model are introduced, such that these models provide a specific dynamics for each correlation. They imply a nonlinear autoregressive form of dependence on lagged correlations and are based on properties of the Hadamard exponential matrix. The new models are applied to a data set of twenty stock market indices, comparing them to the classical DCC and RSDC models. The empirical results show that the new models improve their classical versions in terms of several criteria.monotonic.

Keywords: dynamic conditional correlations, regime-switching dynamic correlations, Hadamard exponential matrix
JEL Classification: C32, C58

2018/10

Accelerated regularized Newton methods for minimizing composite convex functions

Geovani N. Grapiglia and Yurii Nesterov

In this paper, we study accelerated Regularized Newton Methods for minimizing objectives formed as a sum of two functions: one is convex and twice differentiable with Hölder-continuous Hessian, and the other is a simple closed convex function. For the case in which the Hölder parameter $\nu \in [0, 1]$ is known, we propose methods that take at most $O(1/\varepsilon^{1/(2+\nu)})$ iterations to reduce the functional residual below a given precision $\varepsilon > 0$. For the general case, in which the ν is not known, we propose a universal method that ensures the same precision in at most $O(1/\varepsilon^{2/[3(1+\nu)]})$ iterations.

Keywords: unconstrained minimization, second-order methods, Hölder condition, worst-case global complexity bounds
AMS Subject Classification: 49M15, 49M37, 58C15, 90C25, 90C30

2018/11

Long-term care insurance with family altruism: Theory and empirics

Justina Klimaviciute, Pierre Pestieau and Jérôme Schoenmaeckers

This paper studies long-term care (LTC) insurance in the presence of family altruism. In the first, theoretical, part of the paper, we explore whether and how family solidarity affects the application to LTC of Arrow's (1963) theorem of the deductible, which is shown to apply in models without family by a number of papers. We consider two types of family altruism, perfect and imperfect, and find that Arrow's theorem generally holds, even though some departures from the standard model and some differences between the types of altruism exist. Our analysis highlights a complex interplay between parents' insurance and their children's aid, which implies that a number of intuitive conjectures are not always verified. For instance, while one would expect the deductible to be increasing in the child's degree of altruism, this is unambiguously verified only under certain conditions. Given the ambiguity of some results, in the second part of the paper, we resort, more generally, to an empirical test of the relation between LTC insurance and children's altruism using the data from the Health and Retirement Study (HRS). Our findings suggest that children's altruism has a negative impact on parents' LTC insurance purchases, even though some results also point to this relationship being more complex than one might think.

Keywords: long-term care insurance, deductible theorem, altruism, family aid
JEL Classification: D64, I13, J14

2018/12

Approval voting and Shapley ranking

Pierre Dehez and Victor Ginsburgh

Approval voting allows voters to list any number of candidates. Their scores are obtained by summing the votes cast in their favor. Fractional voting instead follows the *One-person-one-vote* principle by endowing voters with a single vote that they may freely distribute among candidates. In this paper, we show that fairness requires the distribution of votes to be uniform. Uniform fractional voting corresponds to Shapley ranking that was introduced to rank wines as the Shapley value of a cooperative game with transferable utility. Here we analyze the properties of these «ranking games» and provide an axiomatic foundation to Shapley ranking. We also analyze Shapley ranking as a social welfare function and compare it to approval ranking.

Keywords: approval voting, Shapley value
JEL Classification: D71, C71

2018/13

Communication games with optional verification

Simon Schopohl

We analyse a Sender-Receiver game in which the Sender can choose between a costless cheap-talk message and a costly verifiable message. The Sender knows the true state of the world, while the Receiver only learns about the state through the message of the Sender. The utility of both players depends on an action the Receiver chooses. We keep the assumptions about the utility functions and about the messages to a minimum and state conditions for fully revealing equilibria. Under the assumption of «smooth» preferences and utility functions we show that a fully revealing equilibrium in which the Sender uses both her message types can only exist as long as the state space and action space are discrete. We

illustrate this result for the classical example of quadratic loss utilities. In a continuous setting we show that there can only exist a fully revealing equilibrium in which the Sender uses different message types in different states if we allow for costless verification in some states of the world or if the utility function of at least one player is discontinuous.

2018/14

Assessing the benefits of horizontal cooperation using a location-inventory model

Thomas Hacardiaux and Jean-Sébastien Tancrez

Horizontal cooperation consists in the collaboration of companies that work at the same levelof the supply chain. The literature discusses several real-life cases and experimental studies of horizontal cooperation, showing that these partnerships generate savings. In this paper, to evaluate these savings, we present a location-inventory model, formulated as a conic quadratic mixed integer program, which minimizes facility opening, transportation, cycle inventory, ordering and safety stock costs. This model enables us to assess the synergy value and the evolution of the cost components, comparing the costs of stand-alone companies and horizontal partnerships. In order to better understand the impact of markets and partners characteristics on the synergy value, we conduct a large set of numerical experiments, varying several key parameters (vehicles' capacity, facility opening cost, inventory holding cost, order cost, demand variability and distances), aiming to offer valuable managerial insights for companies wishing to collaborate. We find that indeed horizontal cooperation can lead to significant savings, with an average coalition gain of 22.5%. Moreover, collaboration is particularly profitable for companies with high facility opening costs and low order costs, carrying small (compared to the vehicle capacity) and inexpensive (low unit holding cost) products in a market with a low demand variability.

2018/15

An imaginary realistic market

Zhengyuan Gao

An imaginary dimension is added to the market, where imaginary values attach to the price, where the imaginary price creates sequential forces, where the imaginary forces influence market participants' beliefs, where heterogenous beliefs guide the market moves, where the market movements provide images that can or cannot be anticipated by the participants but exist in the reality.

2018/16

Uncertainty in economic growth and inequality

Zhengyuan Gao

A step to consilience, starting with a deconstruction of the causality of uncertainty that is embedded in the fundamentals of growth and inequality, following a construction of aggregation laws that disclose the invariance principle across heterogeneous individuals, ending with a reconstruction of metric models that yields deeper structural connections via U.S. GDP and income data.

2018/17

Altruism and long-term care insurance

Justina Klimaviciute, Pierre Pestieau and Jérôme Schoenmaeckers

The aim of this paper is to analyze long-term care (LTC) insurance purchase decisions when parents expect to receive assistance from altruistic children. We first propose a simple theoretical model in which we show that the effect of children's altruism on parents' insurance decision is ambiguous and depends on a number of factors: the degree of substitutability between informal and formal care, the degree of parental altruism and the concavity of the utility functions. We then run an empirical test using data from the US, France, Spain, Germany and Israel. We find that the effect of children's altruism is negative in the US and Israel, but not significant in France, Germany and Spain, which possibly suggests that the different forces identified in the theoretical model are offsetting each other.

2018/18

Network constrained covariate coefficient and connection sign estimation

Matthias Weber, Jonas Striaukas, Martin Schumacher and Harald Binder

Often, variables are linked to each other via a network. When such a network structure is known, this knowledge can be incorporated into regularized regression settings. In particular, an additional network penalty can be added on top of another penalty term, such as a Lasso penalty. However, when the type of interaction via the network is unknown (that is, whether connections are of an activating or a repressing type), the connection signs have to be estimated simultaneously with the covariate coefficients. This can be done with an algorithm iterating a connection sign estimation step and a covariate coefficient estimation step. We show detailed simulation results of such an algorithm. The algorithm performs well in a variety of settings. We also briefly describe the R-package that we developed for this purpose, which is publicly available.

2018/19

Testing for bubbles in cryptocurrencies with time-varying volatility

Christian M. Hafner

The recent evolution of cryptocurrencies has been characterized by bubble-like behavior and extreme volatility. While it is difficult to assess an intrinsic value to a specific cryptocurrency, one can employ recently proposed bubble tests that rely on recursive applications of classical unit root tests. This paper extends this approach to the case where volatility is time varying, assuming a deterministic long-run component that may take into account a decrease of unconditional volatility when the cryptocurrency matures with a higher market dissemination. Volatility also includes a stochastic short-run component to capture volatility clustering. The wild bootstrap is shown to correctly adjust the size properties of the bubble test, which retains good power properties. In an empirical application using eleven of the largest cryptocurrencies and the CRIX index, the general evidence in favor of bubbles is confirmed, but much less pronounced than under constant volatility.

2018/20

Identification of structural multivariate GARCH models

Christian M. Hafner, Helmut Herwartz and Simone Maxand

Multivariate GARCH models are widely used to model volatility and correlation dynamics of nancial time series. These models are typically silent about the transmission of implied orthogonalized shocks to vector returns. We propose a loss statistic to discriminate in a data-driven way between alternative structural assumptions about the transmission scheme. In its structural form, a four dimensional system comprising US and Latin American stock market returns points to a substantial volatility transmission from the US to the Latin American markets. The identified structural model improves the estimation of classical measures of portfolio risk, as well as corresponding variations.

2018/21

Non-parametric well-beging comparisons

Koen Decancq and Annemie Nys

We study the problem of making interpersonal well-being comparisons when individuals have heterogeneous - possibly incomplete - preferences. We present a robust - also incomplete - criterion for well-being comparisons that states that one individual is better off than another one if the intersection between the extended upper contour set of the better off individual and the extended lower countour set of the worse off individual is empty. We implement the criterion in the consumption-health space using an online survey with 2,260 respondents in the United States to investigate how incomplete the resulting interpersonal well-being comparison is. Tochart the contour sets of the respondents, we propose a new «adaptive bisectional dichotomous choice» (ABDC) procedure that is based on a limited number of dichotomous choices and some mild non-parametric assumptions on the preferences. While the ABDC procedure does not reject that the preferences of a large majority of the respondents satisfy these non-parametric assumptions, it has sufficient power to reject several standard parametric assumptions such as linearity or Cobb-Douglas preferences for an overwhelming number of respondents. Finally, we find that about one fifth of all pairs of respondents can be ranked in a robust way with the proposed criterion. A more complete version of the criterion is able to rank more than half of the pairs.

2018/22

Poverty among the elderly: The role of public pension systems

Philippe Jacques, Marie-Louise Leroux and Dalibor Stevanovic

The objective of this paper is to measure the impact of first-pillar public pensions spending on the prevalence of poverty among the elderly. Using data from 27 European countries from 1995 to 2014, we estimate the elasticity of the poverty rate among individuals aged over 65 years to per capita public pension spending. We show the existence of a nonlinear relationship between these two variables. The elasticity is negative and statistically different from 0 only beyond a level of spending of 685 € per capita. At the average value of 2,819€, it is estimated that the elasticity is about -1.45. This nonlinear relation is robust to the treatment of possible endogeneity and to different robustness checks like the variation of the poverty line, and the inclusion of country-specic differences in public pension plans.

2018/23

Prioritization vs zero rating: Discrimination on the internet

Axel Gautier and Robert Somogyi

This paper analyzes two business practices on the mobile internet market, paid prioritization and zero-rating. Both violate the principle of net neutrality by allowing the internet service provider to discriminate different content types. In recent years these practices have attracted consi-

derable media attention and regulatory interest. The EU, and until recently the US have banned paid prioritization but tolerated zero-rating under conditions. With prioritization, the ISP delivers content at different speeds and it is equivalent to a discrimination in terms of quality. With zero-rating, the ISP charges different prices for content and it is equivalent to a discrimination in terms of prices. We first show that neither of these practices lead to the exclusion of a content provider, a serious concern of net neutrality advocates. The ISP chooses prioritization when traffic is highly valuable for content providers and congestion is severe, and zero-rating in all other cases. Furthermore, investment in network capacity is suboptimal in the case of prioritization and socially optimal under zero-rating.

2018/24

Common ranking and stability of overlapping coalitions
Ana Mauleon, Nils Roehl and Vincent Vannetelbosch

Mauleon, Roehl and Vannetelbosch (GEB, 2018) develop a general theoretical framework to study the stability of overlapping coalition settings. Each group possesses a constitution that contains the rules governing both the composition of the group and the conditions needed to leave the group and/or to become a new member of the group. They propose the concept of constitutional stability to study the group structures that are going to emerge at equilibrium in overlapping coalition settings. They combine requirements on constitutions and preferences for guaranteeing both the existence and the emergence of constitutionally stable group structures. In this paper, we show that an alternative way to exclude the ocurrence of closed cycles is to look for constitutions that allow for a common ranking.

2018/25

Network formation with myopic and farsighted players
Chenghong Luo, Ana Mauleon and Vincent Vannetelbosch

We study the formation of networks where myopic and farsighted individuals decide with whom they want to form a link, according to a distance-based utility function that weighs the costs and benefits of each connection. We propose the notion of myopic-farsighted stable set to determine the networks that emerge when some individuals are myopic while others are farsighted. A myopic-farsighted stable set is the set of networks satisfying internal and external stability with respect to the notion of myopic-farsighted improving path. In the case of a homogeneous population (either all myopic or all farsighted), a conflict between stability and efficiency is likely to arise. But, once the population becomes mixed, the conflict vanishes if there are enough farsighted individuals. In addition, we characterize the myopic-farsighted stable set for any utility function when all individuals are myopic.

2018/26

R&D network formation with myopic and farsighted firms
Ana Mauleon, Jose J. Sempere-Monerris and Vincent Vannetelbosch

We study the formation of R&D networks when each firrm benefits from the research done by other firms it is connected to. Firms can be either myopic or farsighted when deciding about the links they want to form. We propose the notion of myopic-farsighted stable set to determine the R&D networks that emerge in the long run. When the majority of firms is myopic, stability leads to R&D networks consisting of either two asymmetric components with the largest component comprises three-quarters of firms or two symmetric components of nearly equal size with the largest component having only myopic firms. But, once the majority of firms becomes farsighted, only R&D networks with two asymmetric components remain stable. Firms in the largest component obtain greater profits, with farsighted firms having in average more collaborations than myopic firms that are either loose-ends or central for spreading the innovation within the component. Besides myopic and farsighted firms, we introduce yes-firms that always accept the formation of any link and never delete a link subject to the constraint of non-negative profits. We show that yes-firms can stabilize R&D networks consisting of a single component that maximize the social welfare. Finally, we look at the evolution of R&D networks and we find that R&D networks with two symmetric components will be rapidly dismantled, single component R&D networks will persist many periods, while R&D networks consisting of two asymmetric components will persist forever.

2018/27

Random encounters and information diffusion about markets
Jean Gabszewicz, Marco Marini and Skerdilajda Zanaj

International openness enhances social interaction between citizens of different countries or regions and vice versa. Social exchanges, in turn, increase trade flows between countries and influence markets and prices. We analyze the increased mobility that follows from openness between two countries and its effects on market outcomes. The primary result of our analysis shows that at the limit, market prices tend to align with the duopoly solution. Nonetheless, this convergence can take two different paths depending on the size asymmetry between countries.

2018/28

Monthly art market returns
Fabian Y.R.P. Bocart, Eric Ghysels and Christian M. Hafner

We provide an innovative methodological contribution to the measurement of returns on infrequently traded assets using a novel approach to repeat-sales regression estimation. The model for price indices we propose allows for correlation with other markets, typically with higher liquidity and high frequency trading. Using the new econometric approach, we propose a monthly art market index, as well as sub-indices for Impressionist, Modern, Post-War, and Contemporary paintings based onrepeated sales at a monthly frequency. The correlations enable us to update the art index via observed transactions in other markets that have a link with the art market. between countries.

2018/29

Taxing multinationals: The scope for enforcement cooperaiton
Jean Hindriks and Yukihiro Nishimura

We present a tax-competition model with two policy instruments: the corporate tax rate and the tightness of tax enforcement (i.e., controls on profit shifting by multinational enterprises). Tougher enforcement increases the cost of profit shifting, and thus mitigates tax competition. In a framework of noncooperative tax choices, we compare the equilibria of the noncooperative and cooperative enforcement choices. After showing that enforcement cooperation may not benefit the low-tax country, we indicate two drivers that promote enforcement cooperation. The first driver of cooperation is complementarity (imperfect substitutability) of countries' enforcement efforts, taking into account that dispersed enforcement efforts among the involved countries are less effective. We show that cooperation is more likely with greater enforcement complementarity. The second driver of cooperation is tax leadership, which reduces the extent of disagreement on tax enforcemeries.

2018/30

Shadow links
Manuel Föster, Ana Mauleon and Vincent Vannetelbosch

We propose a framework of network formation where players can form two types of links: public links are observed by everyone and shadow links are only observed by neighbors. We introduce a novel solution concept called rationalizable peer-conrming pairwise stability, which generalizes Jackson and Wolinsky (1996)'s pairwise stability notion to accommodate shadow links. We then study the case when public links and shadow links are perfect substitutes and relate our concept to pairwise stability. Finally, we consider two specic models and show how false beliefs about others' behavior may lead to segregation in friendship networks with homophily, reducing social welfare.

2018/31

Convex hull results for generalizations of the constant capacity single node flow set
Laurence Wolsey and Hande Yaman

For single node flow sets with fixed costs and constant capacities on the inflow and outflow arcs, a family of constant capacity flow covers are known to provide the convex hull in different special cases and are conjectured to provide it in the general case. Here we study more general mixed integer sets for which such single node flow cover inequalities suffice to give the convex hull. In particular we consider the case of a path in which each node has one (or several) incoming and outgoing arcs with constant capacities and fixed costs. This can be seen as a lot-sizing set with production and sales decisions driven by costs and prices and by the lower and upper bounds on stocks instead of being driven by demands as in the standard lot-sizing model. The approach we take is classical: We characterize the extreme points, derive tight extended formulations and project out the additional variables. Specifically we show that Fourier-Motzkin elimination, though far from elegant, can be used to carry out the non-trivial projections. The validity of the conjecture for the single node flow set follows from our results.

2018/32

Global performance guarantees of second-order methods for unconstrained convex minimization
Pavel Dvurechensky and Yurii Nesterov

In this paper we make an attempt to compare two distinct branches of research on second-order optimization methods. The first one studies self-concordant functions and barriers, the main assumption being that the third derivative of the objective is bounded by the second derivative. The second branch studies cubic regularized Newton methods with main assumption that the second derivative is Lipschitz continuous. We develop new theoretical analysis for a path-following scheme for general self-concordant function, as opposed to classical path-following scheme developed for self-concordant barriers. We show that the complexity bound for this scheme is better than for Damped Newton Method. Next, we analyze an important subclass of general self-concordant function, namely a class of strongly convex functions with Lipschitz continuous second derivative and show that for this subclass cubic regularized New Methods give even better complexity bound.

Keywords: self-concordant function, Damped Newton Method, cubic regularized Newton method, path-following method

2018/33

Révéler la polarisation économique d'une ville à partir de traces GPS de camions. Le cas de Liège
Olivier Finance, Arnaud Adam, Jonathan Jones and Isabelle Thomas

Avec la multiplication des capteurs, nous disposons désormais de quantités massives de données à l'échelon individuel. Dans cette contribution, nous illustrons comment une nouvelle source de données issue du système de prélèvement kilométrique des camions en Belgique peut présenter une plus-value pour le géographe. Dans ce cas précis, le suivi spatio-temporel quasi-exhaustif des camions est utilisé afin de dessiner une géographie précise des circulations de camions en Belgique et d'explorer la place spécifique de Liège dans ce réseau. La quasi-exhaustivité de ces données nous permet-elle réellement de dépasser les biais classiques telles l'agrégation ou la représentativité des données ? En quoi révèlent-elles l'ADN des territoires?
Tout en discutant l'apport des «big-data», en particulier en géographie des transports, nous présentons la méthodologie mise en oeuvre pour passer des données GPS brutes à une matrice origines-destinations plus classique. Plusieurs méthodologies sont appliquées à cette matrice pour révéler comment les big-data peuvent nous aider à révéler une facette de la polarisation économique d'une ville.

Mots-clés: big-data, interactions, transport, traces spatio-temporelles, hinterland, polarisation

2018/34

SRI: Truths and lies
Bertrand Candelon, Jean-Baptiste Hasse and Quentin Lajaunie

This paper proposes a skeptical look at the socially responsible investing (SRI) industry. Building upon a new database for European and American domestic equity mutual funds, it investigates whether there is a discrepancy between what is said (e.g., names or labels) and what is done (investments of mutual funds holdings) about SRI. It turns out that the correspondence between *de jure* and *de facto* SRI is weak. Additionally, using a novel nonlinear factor-augmented panel model, it is found that the *de facto* ethical positioning only matters for the funds' financial performance. Both results shed new light on the SRI industry and pave the way for a new regulation framework.

Keywords: socially responsible investing (SRI), environmental, social and governance (ESG) criteria, ethical mutual funds, performance measurement