



ABSTRACTS

6th Seminar D² Seminar Series

Florence Center for Data Science 'Double' Seminar Series

Giulia Iori - Department of Economics of the City University of London

Title: *Performance-based research funding: Evidence from the largest natural experiment worldwide*

Abstract: The Research Excellence Framework (REF) is the main UK government policy on public research in the last 30 years. The primary aim of this policy is to promote and reward research excellence through competition for scarce research resources. Surprisingly, and despite the severe criticisms, little has been done to systematically evaluate its effects. In this paper, we evaluate the impact of the REF 2014. We exploit a large database that contains all publications in Economics, Business, Management, and Finance available in Scopus since 2001. We use a synthetic control method to compare the performance of each of the universities from the UK with counter-factual similar units in terms of past research constructed using data for US universities. We find a significant positive increase, relative to the control group, in the number of published papers, and in the proportion of papers published in highly ranked journals within the Economics/Econometrics area and the Business, Management and Finance area. Both Russell and non-Russell Group universities benefited from the REF, with the Russell Group universities experiencing an overall significant increase in the number of publications and number of publications in top journals, and the non-Russell group experiencing a significant increase in the proportion of publications in top journals in all areas. Interestingly, the non-Russell group experienced a comparatively stronger increase in the proportion of top publications in Economics/Econometrics while the Russell Group experienced a comparatively stronger increase in the proportion of top publications in Business, Management and Finance. However, we see an insignificant effect when we focus on per-author output measures indicating that growth in output was mostly achieved by an increase in the number of research active academics rather than an overall increase in research productivity.

Massimo Fornasier - Department of Mathematics of the Technical University of Munich

Title: *Consensus-based optimization*

Abstract: Consensus-based optimization (CBO) is a multi-agent metaheuristic derivative-free optimization method that can globally minimize nonconvex nonsmooth functions and is amenable to theoretical analysis. In fact, optimizing agents (particles) move on the optimization domain driven by a drift towards an instantaneous consensus point, which is computed as a convex combination of particle locations, weighted by the cost function according to Laplace's principle, and it represents an approximation to a global minimizer. The dynamics are further perturbed by a random vector field to favor exploration, whose variance is a function of the distance of the particles to the consensus point. Based on an experimentally supported intuition that CBO always performs a gradient descent of the squared Euclidean distance to the global minimizer, we show a novel technique for proving the global convergence to the global minimizer in mean-field law for a rich class of objective functions. We further present formulations of CBO over compact hypersurfaces. We conclude the talk with a few numerical experiments, which show that CBO scales well with the dimension and is extremely versatile.

<https://arxiv.org/pdf/2103.15130.pdf> to appear in Found. Comput. Math.

<https://arxiv.org/pdf/2001.11994.pdf> appeared in M3AS

<https://arxiv.org/pdf/2001.11988.pdf> appeared in J. Mach. Learn. Rech

<https://arxiv.org/pdf/2104.00420.pdf> to appear in SIAM J. Opt.