

Advances in Econometrics and Machine Learning

University of Manchester

Location: G.018 AMBS, University of Manchester ([Link to Map](#))

Date: Friday 22 May 2026

Schedule

Duration	Time	Session
30 min	9:45–10:15	Reception and welcome
45 min	10:20–11:05	Bertille Antoine: Robust Estimation in Conditional Moment Models with Time-Varying Parameters
45 min	11:10–11:55	Mingli Chen: Online Learning with Semiparametric Stochastic Approximation
90 min	12:00–13:30	Lunch at Beehive Restaurant
45 min	13:45–14:30	Hiroaki Kaido: Testing Exclusion and Shape Restrictions in Potential Outcomes Models
45 min	14:35–15:20	Michael Kohler: Statistically Guided Deep Learning
30 min	15:25–15:55	Coffee break
45 min	16:00–16:45	Abderrahim Taamouti: Systemic Growth-at-Risk and Growth Spread Measures
45 min	16:50–17:35	Weining Wang: Causal State-Dependent Local Projections
	19:30	Dinner at The Refuge

Talk Information

Robust Estimation in Conditional Moment Models with Time-Varying Parameters

Bertille Antoine, Simon Fraser University

Abstract: In a parametric conditional moment model with time-varying parameters, we develop a new integrated conditional moment (ICM) estimator which uses all information from conditional restrictions seamlessly. Our approach builds on the ICM principle originally proposed by Bierens (1982) and combines it with local smoothing to deliver estimates of the time-varying parameters. Under general regularity conditions - including local stationarity and restrictions on physical dependence - we show that our estimator is pointwise consistent and asymptotically normally distributed. Importantly, our approach is a one-step approach that is robust to parametrizing - and estimating - the relationship between endogenous variables and instruments. In addition, we derive uniform results that enable us to construct asymptotic simultaneous confidence tubes. Our simulation study document the reliability and power of our approach in a variety of cases - and, especially, when the underlying relationship between the endogenous variables and the instruments cannot be reliably estimated - even with flexible time-varying approaches. Our estimation of the traditional Phillips curve that links inflation to unemployment with US data from 1960 to 2024 reveals important fluctuations over time, including the diminishing importance of unemployment, especially after 2006.

Online Learning with Semiparametric Stochastic Approximation

Mingli Chen, University of Warwick

Testing Exclusion and Shape Restrictions in Potential Outcomes Models

Hiroaki Kaido, Boston University

Abstract: Exclusion and shape restrictions play a central role in defining causal effects and interpreting estimates in potential outcomes models. To date, the testable implications of such restrictions have been studied on a case-by-case basis in a limited set of models. In this paper, we develop a general framework for characterizing sharp testable implications of general support restrictions on the potential response functions, based on a novel graph-based representation of the model. The framework provides a unified and constructive method for deriving all observable implications of the modeling assumptions. We illustrate the approach in several popular settings, including instrumental variables, treatment selection, mediation, and interference. As an empirical application, we revisit the US Lung Health Study and test for the presence of spillovers between spouses, specification of exposure maps, and persistence of treatment effects over time.

Statistically Guided Deep Learning

Michael Kohler, Technische Universität Darmstadt

Abstract: A theoretically well-founded deep learning algorithm for nonparametric regression is presented. It uses over-parametrized deep neural networks with logistic activation function, which are fitted to the given data via gradient descent. Motivated by a theoretical analysis of deep learning which takes into account simultaneously optimization, generalization and approximation, a special topology of these networks, a special random initialization of the weights, and a data-dependent choice of the learning rate and the number of gradient descent steps is proposed. A theoretical bound on the expected L_2 error of this estimate is presented, and its finite sample size performance is illustrated by applying it to simulated data.

Systemic Growth-at-Risk and Growth Spread Measures

Abderrahim Taamouti, University of Liverpool Management School

Causal State-Dependent Local Projections

Weining Wang, University of Bristol

Abstract: State-dependent local projections (LPs) are widely used to estimate how responses to exogenous aggregate shocks vary as a function of observable state variables, yet their causal interpretation remains unclear. We show that this interpretation obtains under the sufficient condition that the conditional mean is linear in the aggregate shock at each horizon, and that this condition holds in a broad class of canonical micro–macro environments, including first-order perturbation solutions of heterogeneous-agent models and macro-finance models. Under this condition, LPs recover causal impulse responses without requiring specification of the full data-generating process. We further show that the causal interpretation of state-dependent LPs is robust to the choice of state variable. By contrast, commonly used linear interaction LPs generally fail to recover causal objects. We therefore develop a sieve-based nonparametric LP estimator that restores causal interpretation and delivers valid pointwise and uniform inference in micro–macro panels. Empirically, allowing for nonparametric state dependence materially changes both the pattern of heterogeneous firm investment responses and their aggregate implications for the transmission of monetary policy shocks.