

Network for Statistical and Causal Inference, Pisa, 11 September

:: Lorenzo Casini

Abstract

This article reports the main content of the talks presented at the fourth meeting of the Network for Statistical and Causal Inference, at Sant'Anna School of Advanced Studies, Pisa, 11 September 2025.

Keywords

Causal discovery, machine learning

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The fourth meeting of the Network for Statistical and Causal Inference (NESCI) took place at Sant'Anna School of Advanced Studies, Pisa, on 11 September. It was organized by Alessio Moneta (Sant'Anna), Lorenzo Casini (Bologna), Gustavo Cevolani (IMT), and Francesco Serti (IMT). It was sponsored by the Dept of Excellence "Economics, Management and Law in the Era of Data Science" (L'EmBeDS) and the grant SMaRT COOnSTRUCT by Future of Artificial Intelligence Research (FAIR).

The workshop was opened by the keynote talk "Causal Modeling with Stationary Processes" by Mathias Drton (Technical University of Munich). The talk focused on causal discovery from multivariate cross-sectional data in the presence of feedback loops and directed cycles. Focusing on the framework of Graphical Continuous Lyapunov Models, Drton presented a central theorem: the model is globally identifiable if and only if the directed graph is simple, meaning there is at most one edge between any pair of nodes.

The second talk "A Causal Framework for Evaluating Deferring Systems" was given by Andrea Pugnana (University of Trento). He introduced a causal framework for evaluating deferring systems. The core function of such a system is a



deferral policy that decides whether to rely on the AI's prediction or to defer the decision to a human expert based on a potential outcome protocol.

The third talk “High-Dimensional Causal Projection Estimators under Weak Confounding” was given by Alessio Sancetta (Royal Holloway University), who addressed the challenges of causal inference in high-dimensional settings with latent confounders. He proposed a framework using causal projection estimators that are consistent and asymptotically normal, even when faced with weak confounding, fat-tailed distributions, and time series dependence.

The next talk “A Practical Approach to Causal Inference over Time”, given by Isacco Beretta (University of Pisa), presented a practical approach to causal inference using time series data via a formal link between discrete-time dynamical systems and Structural Causal Models (SCMs) under additive and forcing interventions.

The final talk “Identification of One Independent Shock in Structural VARs” was given by Francesca Papagni (University of Bergamo). She discussed a method for the partial identification of a single independent shock in Structural Vector Autoregressive (SVAR) models, which relaxes the standard assumptions of Independent Component Analysis (ICA), including results from Monte Carlo experiments that showed the effectiveness of their estimator and an empirical application to the effect of economic activity on uncertainty.

The workshop was a success. It was well attended both in person and remotely. The next event of NESCI is planned for 2026 and will take place at IMT Lucca.

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