

Forecasting financial markets by means of information filtered graphs

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In this talk we propose network-theoretic tools [1] to filter information in large-scale datasets and we show that applications to financial data-sets can meaningfully identify industrial activities and structural market changes. Network filtering procedures are valuable tools for risk management and portfolio optimization too [2,3] and they allow to construct probabilistic sparse modeling for financial systems that can be used for forecasting, stress testing and risk allocation [4,5].

In particular we look at correlation-based information filtering networks, we show that there exists a deep interplay between past changes in correlation structure and future changes in market volatility and we use such empirical evidence to provide a new tool to forecast portfolio risk [4].

[1] G. Previde Massara et al., *J. Complex Network* **5(2)**, 161 (2016).

[2] N. Musmeci et al., *JNTF* **1(1)**, 1 (2015).

[3] N. Musmeci et al., *PLoS ONE* **10(3)**, e0116201 (2015).

[4] N. Musmeci et al., *Sc. Rep.* **6**, 36320 (2016).

[5] W. Barfuss et al., *Phys. Rev. E* **94**, 062306 (2016).