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MASTER'S THESIS PRESENTATION

Copula Linked Univariate Dvine for Modeling Multivariate Time Series

WHEN
July 1, 2022
9:00 AM

WHERE
Location or Zoom info here
For ZOOM presentations, details will be provided in an email announcement for this seminar.

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Modeling the cross sectional and temporal dependence of multivariate time series is of interest in a variety of fields. Traditional models such as AR and GARCH are purely conditional and do not specify the joint distribution of the component time series. Previous copula based approaches specify the joint distribution of all observations which can be computationally expensive for high dimensions.

The Copula-linked Univariate Dvine (CuDvine) represents a flexible alternative to these models wherein the joint distribution of each component time series is specified using a D-vine copula, and the cross sectional at a given time distribution of the component time series is specified by a cross sectional copula conditioned on the dependence in each component univariate time series. Cudvine is able to model complicated high order Markov chains such as Ar(9) processes as well as process with time varying covariance structures with a high level of precision. This will be shown by way of simulation in section 4. Additionally, Cudvine can be adapted to high dimensions by imposing a structure on the cross sectional correlation which allows it to remain computationally feasible for high dimensional data. In section 4.5 Cudvine is applied to real data on the Australian Electricity Pricing. It is shown that Cudvine outperforms commonly used alternatives such as VAR in one day ahead prediction accuracy.

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