

Multimodality on the geometric combination of Bayesian forecasting models*

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Abstract

We propose the geometric combination of predictive probability density functions as an alternative approach to the usually adopted linear combination. We show the conditions under which the geometric combination of Student t -densities is unimodal. Also, unlike the linear methods, geometric combinations are of closed form for densities from the regular exponential family and thus unimodal.

A comparative analysis of linear and geometric combinations of predictive Student t -densities from regression dynamic linear models in a case of beverage sales forecasting in Zimbabwe shows the geometric method consistently producing skewed but unimodal densities. Consequences of decisions associated with both symmetric (quadratic and exponential) and non-symmetric (logarithmic) loss functions are investigated for multimodal linear combination densities when different location parameters (means and largest modes) are chosen as point estimates.

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