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Sub-model aggregation for scalable spatially varying coefficient modeling

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This study aggregates/combines global and local sub-models to build a fast and flexible spatially varying coefficient model. An approach inspired by the generalized product-of-experts method is used to aggregate the sub-models. The aggregated model has the following properties: (i) computationally efficient; (ii) the marginal likelihood is available in closed-form; (iii) each sub-model can be estimated independently to maximize the likelihood. Owing to (ii) and (iii), the proposed model describes complex spatial patterns flexibly and computationally efficiently. The accuracy and computational efficiency of the proposed method are compared with alternatives through Monte Carlo simulation experiments. Then, the method is applied to a regression analysis of residential land prices in Japan.

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