

# **Grouped fixed effects regularization for binary choice models**

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## **Abstract**

We study the application of the Grouped Fixed Effects (GFE) estimator (Bonhomme et al., ECMTA 90(2):625-643, 2022) to binary choice models for network and panel data. This approach, which discretizes the unobserved heterogeneity via k-means clustering in the first step and performs maximum likelihood estimation in the second, has the advantage of effectively reducing the number of fixed-effects to be estimated in finite samples. Such regularization could be particularly useful to practitioners in the analysis of small/sparse networks and rare events: it reduces the instances of complete separation, that entails losing a large portion of the data. As leading examples, we focus on dynamic binary choice models in presence of phenomena with few state transition and network formation models for small and sparse networks. The effectiveness of the regularization in both scenarios is provided via simulations and applications on real data.