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Week 5 Summary

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In the article “Graph Neural Networks for social Recommendation”, the authors point out the three challenges of building social recommendation systems based on GNN – combining social graph and user-item graph inherently, capturing interactions and opinions between users and items jointly, distinguishing social relations with heterogeneous strengths. To solve these problems, the authors propose a novel graph neural network named GraphRec for social recommendations. The architecture of the GraphRec consists of three components: user modeling, item modeling, and rating prediction. User modeling is the first component, and its purpose is to learn latent factors for users. Since there are two different data graphs in social recommendation, which are social graph and user-item graph, there are two aggregations to process these graphs. Item aggregation is used to understand users via interactions between users and items in the user-item graph, and social aggregation is used to model users from the social perspective. Once all the aggregations finished, the information from both item space and social space will be combined to obtain user latent factors. The second component is item modeling, and its purpose is to learn latent vectors of items. It uses user aggregation to aggregate user’s opinions in item modeling. The last component is to learn model parameters via prediction by integrating user and item modeling components. For the experiment and result, the authors use two real world datasets demonstrate the effectiveness of the GraphRec, by calculating its mean absolute error and root mean square error and comparing the results to the other methods including traditional recommendation systems, traditional social recommendation systems, and deep neural network based recommendation systems.