Pixie Algorithm Explained

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Pixie was developed by Pinterest to provide real-time, personalized, content recommendations at large scales. It uses a bipartite graph to leverage the interconnected content of Pinterest. It uses users, pins, boards, and topics, represented as nodes connected by edges that signify interactions such as follows, saves, clicks, as well as the pin topics and boards.

Starting from either the user that needs a recommendation or content that the user has interacted with, the graph can be randomly traversed revealing pins, boards, topics and users that the target user may want to follow or otherwise interact with. It is very fast and efficient to traverse this graph so recommendations can be made very quickly

Random walks reveal relevant recommendations because inherently by the structure of the graph, only similar items will be connected directly or by a short walk. The algorithm also finds non obvious recommendations because if two or more communities have a lot of overlap, they may in fact be one community. This will be revealed by a moderate walk.

This algorithm can be applied almost anywhere that recommendations are needed. It is dynamic to the number of features available as well as users. Recommendations can be made if the collective data is enough rather than relying on any single feature such as users or item data, it is a hybrid approach. Due to the use of bipartite graphs, it is also highly adaptable to any situation that recommendations are needed such as movies, comics, videos, games, or even food and shopping.