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Introduction

Have you ever wondered why you get along so well with your friends? Most likely, it is because their preferences and interests are similar to yours.

This concept is often referred to as homophily. It also applies to fraud detection, when fraudsters work together to set up malicious collaborations.

In this course, I start by introducing the key concepts of social networks and review some example applications. I then discuss how various metrics can be used to analyze and summarize social networks in a descriptive way. A subsequent section includes using community mining to find meaningful subgroups in networks. I also discuss how social networks can be leveraged in a predictive way with the use of social-network-based inference procedures. I extend unipartite networks to bipartite and even multipartite networks. The course concludes by introducing GOTCHA, a new, social-network-based, fraud detection technique, which was developed by the DataMiningApps research team that I cochair at the KU Leuven university in Belgium.

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