

A SOCIAL NETWORK ANALYSIS OF THE ORIE FACULTY HIRING NETWORK

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ABSTRACT. We study the Operations Research/Industrial-Systems Engineering (ORIE) faculty hiring network, consisting of 1,179 faculty origin and destination data together with attribute data from 83 ORIE departments. A social network analysis of the faculty hires can reveal patterns that have an impact on the dissemination of educational innovations within a profession. We first statistically test for the presence of a linear hierarchy in the network and for its steepness. We proceed to find a near linear hierarchical order of the departments, which we contrast with other indicators of hierarchy, including published rankings. A single index is not able to capture the structure of a complex network, so we next fit a latent variable exponential random graph model for the faculty hires, which is able to reproduce the main observed network characteristics: high incidence of self-hiring, skewed out-degree edge distribution, low density (except at the top of the hierarchy) and clustering. Finally, we simplify the network to one where faculty hires take place among three groups of departments. We discuss the implications of these findings for the flow of education and teaching ideas within the ORIE discipline and compare our findings with those reported for other related disciplines, Computer Science and Business.

Keywords: academic market analysis, hierarchical networks, exponential random graph models, latent location graph model.