



Language
Technologies
Institute

Thesis Defense

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Computational Social Roles

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Abstract

Participants in online communities often enact a variety of social roles in the process of helping their communities and the public at large. Better understanding members' roles benefits members by clarifying how they should behave to participate effectively and also benefits the community overall by encouraging members to contribute in ways that best use their skills and interests. Social sciences have provided rich theoretic taxonomies of social roles, while natural language processing techniques enable us to automate the identification of social roles in online communities. However, most social science work has focused on generic roles without accommodating the activities associated with tasks in specific contexts or automating the process of role identification. While there has been work to date about automatic role inference, identification of social roles has not had a corresponding strong emphasis in the language technologies community. Various methods were developed to extract specific "roles" or patterns in different contexts, lacking generalized definitions about what roles are and systematic methods to extract roles.

This thesis advocates for both theories of social science and models of text analysis to better define roles, develop ways to extract roles and optimally recommend roles to users. Concretely, this work defines what social roles are by introducing five facets associated with roles, and proposes a generic methodology for role identification. It also demonstrates how to computationally model roles in two socially important contexts - Wikipedia and Cancer Survivor Network. Via studies on two large-scale contexts, this research reveals details about emergent, behavioral roles, and a set of computational techniques to identify such roles via fine-grained operationalization of users' behaviors. This work fills the longstanding gap in role theory about emergent roles in online communities, and lays the foundation for future work to computationally understand roles that people enacted in groups both online and offline.

https://www.cs.cmu.edu/~diyiy/Diyi_Yang_thesis.pdf

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