Abstract

We are developing an Internet platform called MediaTeam that provides a marketplace connecting media content consumers to communities of media content creators. The platform is enabled by our method for automated assembly of virtual project teams. Media creators use the automated team assembler to quickly identify and team with collaborators. The team assembly platform factors in how the skills, work, and communication styles of team members complement each other into its team recommendation process. We are now testing the teaming and collaboration platforms with video creators and seek to launch by the summer.

Background

While the need to rapidly assemble, activate and manage virtual teams is acute in video production, these capabilities are increasingly important across the complete spectrum of modern work. Literature surveys of virtual teaming (Ebrahim, Ahmed, and Taha 2009) identify the use of virtual teaming across nearly every professional endeavor. The principle challenge is that of management: how does one manage roles, project deadlines and conflicts in teams that have minimal (if any) physical interaction? This argues for team selection platforms that factor in team cohesion. Yet, our analysis of existing platforms reveals little in the way of support team-specific construction, let alone the ability to factor in cohesiveness. Collaborator recommendation (McDonald, Ackerman 2000) and matchmaking (Diaz, Metzler and Amer-Yahia 2010) systems focus mostly on interest and skills selection and do not consider selection of complementary skills and work styles. Commercial outsourcing platforms (e.g. odesk.com) provide per-skill-set search and recommendation but do...
not consider cohesion-supporting factors important in the selection of a team.

The process of virtual team construction is therefore one in which an individual wishing to form a team describes the complementary skills necessary in team members, defines the budget and time constraints and then submits this description to a system which then returns dossier of individuals recommended for the team, giving consideration to the skills, communication styles, and experiences of the team members. MediaTeam automates this process by running team construction algorithms upon semantic networks derived from profession-oriented websites and social networks.

**How It Works**

The core technology of virtual team creation is an engine that creates a semantic network of individuals, their interests, capabilities, and availabilities from social network data. This semantic network is called the Community Capability Graph (CCG), where vertices correspond to individuals, and edges correspond to relations and community attributes relevant to expertise.

A media creator seeking a team provides either a description of the task that they are seeking help with, a description of the kinds of roles that they need to fill, or the explicit skills they are seeking. This description is used to create a set of team roles. These team roles constrain a search on the CCG; and the result of this search consists of suggested assignments of team roles to individuals retrieved from the CCG.

**Figure 2:** Structure of the Media Team application. Users interact through a variety of social media

The process of project-team creation is defined in Figure 2. A system administrator provides core information sources and constructs templates required to describe the roles and capabilities that a registered user (a team creator) of the system will use to define project team requirements. Information sources include task-specific blogs, online community forums, social networks, member profiles, and websites that directly describe the skills, work and interests of potential team members. For each class of data source document we have developed feature extraction processing pipelines that produce CCGs. To predict cohesiveness, we consider several factors among them: communication style (are the preferred communication modalities of team members complementary) and trust reputation (recommendations attesting to team member reliability). Multiple capability graphs are merged to produce a consolidated semantic network describing the complete span of the knowledge of the team builder of possible team members.

We cast team construction as determining a perfect match between the two graphs where all candidate team members are selected from union of all community capability graphs. This is bounded by $O(V^2*\log(V) + V^2*E)$ using Dijkstra’s algorithm (Fredman 1987), where vertices $V$ correspond to members and roles and edges $E$ correspond to assignments and weighted by scores computed by member evaluation functions. By categorizing the candidate team members by role and keeping a priority queue for each role class, running time can be log linear in $V$.

**Preliminary Findings**

We have evaluated the system using over 5000 profiles from the vimeo.com and imdb.com sites averaging milliseconds to provide a seed set consisting of tens of recommendations.

**Next Steps**

We are currently expanding the search breadth of the system and will launch the service shortly.

**References**


