Towards a Computational Model of Creative Cultures

Introduction and Background

Creative behaviour is personally, socially and culturally situated: creative individuals work within environments rich with personal experiences, social relationships and accumulated cultural knowledge. Creative individuals are often drawn to particular locations at the intersections of cultures because they offer the richest opportunities for novel and diverse cultural experiences. For example, Vienna at the beginning of the 20th Century was a fertile environment for creative ideas because of its geographic location at the crossroads of Eastern and Western cultures.

Csikszentmihalyi et al's Domain Individual Field Interaction (DIFI) framework is a unified approach to studying human creativity that provides an integrated view of individual creativity within a social and cultural context. According to this framework, a *creative system* has three interactive subsystems: *domain*, *individual* and *field*. A domain is an organised body of knowledge, including specialised languages, rules, and technologies. An individual is the generator of new works in a creative system, based on their knowledge of the domain. A field contains all individuals who can affect the content of a domain, e.g., creators, audiences, critics, and educators.

The interactions between individuals, fields and domains (illustrated in Figure 1) form the basis of the creative process in the DIFI framework: individuals acquire knowledge from domains and propose new knowledge evaluated by the field; if the field accepts a proposed addition, it becomes part of the domain and available for use by other individuals.

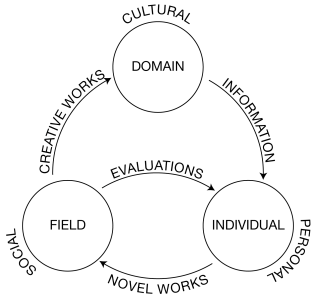

Figure 1: The DIFI model of creative systems

Previous Work

Computational models of creative individuals, developed by the authors, attempted to model some of the motivations that drive individuals to be creative. Curious agents embody a model of curiosity based on studies of humans and other animals, where curiosity is triggered by a perceived lack of knowledge about a situation and motivates behaviour to reduce uncertainty through exploration. Unlike earlier models of creative processes that try to maximise some utility function, curious agents are motivated to discover 'interesting' works based on their previous experiences.

Inspired by the DIFI framework, we have used curious agents to develop computational models of creative fields to investigate emergent social phenomena, e.g., the formation of cliques. Using curious agents to model creative fields allowed us to produce a simple model of the creative fields where curious agents share 'interesting' works with peers for evaluation. Works that are determined to be 'interesting' by individuals other than the creator are added to a central repository of 'creative' works.

Our current research project extends our previous work by incorporating additional aspects of the cultural situation that affect the production, evaluation and adoption of creative works. Significantly, this involves the development of a new model of the evolution of language in creative cultures.

The Proposed Model

As a first step towards developing a model of culturally situated creativity, we are initially focussing on developing a model of the evolution of specialised languages associated with one or more creative domains. In doing so, we are exploring the ways in which the evolution of language and creative behaviour of individuals and fields affect each other. How does creative behaviour affect the evolution of language? How does the evolution of language affect creative behaviour?

To develop our new model, we are extending the earlier work of Steels who developed a model of the evolution of language as a consequence of a population of agents playing 'language games'. Such models are capable of producing lexicons of words with meanings grounded in experience and that these meanings can differ between social groups. Anyone who has communicated across disciplinary boundaries will likely have experienced something similar, e.g., familiar words having unfamiliar meanings. The resolution of tensions created when individuals from different fields communicate has the potential for creative output as the meanings of words are negotiated.

We are currently extending the existing models by developing language games for based on the interactions within a creative systems, where *speaker* and *listener* become *creator*, *audience* and *critic*.

Discussion

Exploring the relationship between language and creativity opens up the potential to develop a computational model of creative cultures. In contrast to existing social models, such a cultural model will allow agents to record traces of their interactions, experiences and related artefacts. These records and descriptions serve as starting points for agents to study and develop new knowledge as well as to transfer knowledge between domains. The proposed model represents the next step towards modelling the cycle of production in creative systems; from the domain to the individual to the field and back to the domain.

Keywords: creativity, culture, language