Memes and Mutation: 
Societal Implications of 
Evolutionary Agents in Push Technologies

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ABSTRACT

Push technologies are rapidly moving toward autonomous and evolutionary intelligent agents for seeking, organizing, and creating information via the Web and other pervasive and innovative information technologies. We describe and define autonomous and evolutionary agents designed for push technologies. Memes, which are messages one agent broadcasts to another, causing the agent to evolve are introduced and we explore how memes will influence evolutionary agents. We develop the social implications of meritorious and malevolent memes exchanged by evolutionary agents. In the conclusion we explore the interactions among humans, evolutionary agents, and memes in order to reflect upon the future. Finally, we raise a series of future research questions regarding genetic determination of evolutionary agents, whether it is possible to predict if a meme will be meritorious or malevolent, and ask whether it is desirable to legislate the evolution of agents that are evolved from malevolent memes. Our contribution is to raise awareness of the movement toward push technologies deploying evolutionary agents and its promise and caveats, as well as to provide future research directions.

Keywords: agent technology; autonomous agent; evolutionary agent; memes; push technology; virus

INTRODUCTION

In Web-based push systems, intelligent agents are used to personalize and filter out unsolicited messages. The agent is able to employ user profiles to screen out unwanted content based on a set of predetermined criteria. When agents act on their own without immediate, direct input from users, they are called autonomous agents. When agents can change based on what they observe, they can be called evolutionary agents.

In this paper we explore the world of autonomous versus evolutionary agents that support and aid information seekers
on the Web. We accomplish this by the use of illustrative examples of push technologies. We then introduce the concept of memes, messages that evolutionary agents use to communicate with each other, and how they influence evolutionary agents. The heart of the paper describes the social implications of meritorious and malevolent memes and their interplay between humans and evolutionary agents. Finally, the conclusion explores what will happen in the upcoming generations of evolutionary agents, humans, and memes, and future research directions are provided.

AUTONOMOUS AGENTS AS USED IN PUSH TECHNOLOGIES

Autonomous agents develop their rules through the use of user profiles and data mining. User profiles are general preferences set up far in advance; for example, a user might prefer an aisle seat. The agent must then determine whether the seat preference or the airline preference be given more weight. Data mining (Codd, 1995; Gray & Watson, 1998; Watson & Haley, 1997) uses a wide range of methods to determine patterns that may predict a user’s preference.

Autonomous agents are used not only to automate information gathering, but ultimately to steer the user in the direction it thinks the user wants to go. For example, Amazon.com, the large online bookseller, uses agents to track customers’ preferences and report the results using collaborative filtering. Recommendation systems are used to suggest which Web site a user visits (Stohr & Viswanathan, 1999).

Autonomous agents can find cheaper airfares, worthwhile books to purchase, parts to upgrade your computer, stock tips, and other opportunities. Agents may also advise stock brokers and travel planners to call you and generate e-mail messages that include suggestions for books and computers to purchase. Some of these recommendations may be perceived to be desirable while others may not.

Autonomous agents attempt to match what the content provider wants to send and what it thinks users want to receive. This assumes that an agent can actually know what the user wants. Agents require complex models and insights about human behavior to obtain, systematically analyze, and act on information collected from and about users.

EVOLUTIONARY AGENTS AS USED IN PUSH TECHNOLOGIES

Evolutionary agents can observe the behavior of an individual over time and notice, not only those patterns observed by the autonomous agent, but the changes in the patterns.

Individuals change. They receive education that transforms their thinking, they hear opinions of friends and family, and they may also be evangelized or recruited so that they see everything in a new light. Evolutionary agents notice these changes and act accordingly. Evolutionary agents deliver what the user needs, not merely what the user wants.
Evaluating E-commerce Trust Using Fuzzy Logic

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