

An Agent Society to Recognize Emerging Consumer Preferences

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Market research often focuses on determining consumer preferences in a variety of dimensions and matching those preferences with product and service feature changes and enhancements. The purpose of this project is to develop a system of cooperating agents which can by continuously searching for emerging consumer preference patterns in an on-line, dynamic, and informationally rich database. Research by one of the authors provides the data collection apparatus which is used for the agent society in the current research. That apparatus is detailed briefly below followed by a description of the agent society.

Consumer Research Online is a state_of_the_art web_based tool that can be used in research applications including consumer research, product development, supply chain management, retail atmospherics, and forecasting. It allows the user to create an on_line, interactive visual database that can be accessed by respondents in retail settings, research facilities, and even in their own homes. The system provides instantaneous feedback from subjects. It can track their choices, the clickstream associated with these choices, and information gathered online can be integrated with other databases.

In the application, respondents first identify images and characteristics of their ideal future lifestyle. This information includes sets of images of people associated with this lifestyle as well as demographic and psychographic descriptors that characterize respondents' lifestyle aspirations. Then the research metaphor is introduced, which involves respondents walking through the hypothetical house of the person associated with their ideal lifestyle. Respondents make selections of items in various product categories, and create product collages that define an aspirational lifestyle. The social and physical settings used to prompt the creation of these product collages as well as the product categories employed are determined by project needs.

The system is a browser_based software interface with an extensive database layer that handles storage and retrieval of visual images. The core functionality of this web tool is designed to perform as a client_server system. However, the software package is adaptable to several formats, including hybrid server/CD_ROM systems, laptop/desktop resident applications, and computer kiosk systems. In each application internet access is used to provide the data stream to centrally maintained databases.

Consumer choices are captured in databases. Our research focuses on agent processing of the

continuous data stream being captured in these databases. We are using an agent society consisting of three types of agents for each study. Each study, for our purposes, produces a single data base consisting of rows of subjects and columns of their preferences on a variety of dimensions. The study is using agents which recognize and store information genetically. The database is the food source for the first type of agent. This agent type consists of specialist subtypes. These subtypes “feed” on the data contained in specific combinations of columns within the database. After each feeding, the agents produce offspring in proportion to how well their current genetic code matches the “code” represented by the data set they are feeding on. Originally, there will be a one-to-one mapping between the genetic material and the data fed on in the database.

The second type of agent in the society “milk” the first type for copies of their genetic information like the symbiotic relationship of certain aphid and ant species. The “ants” in this study are considerably longer lived than the “aphids.” They collect milk across type one subtypes and over time. Both the number of agent type one within a subtype and the variety within the subtype will change according to the suitability of the data for reproduction. The second agent type, worker ants, receive a search pattern template from the third agent type, the ant “queen.” The search template is the rule set for how the worker ant will transverse the data matrix, milking aphids, and then return to the queen. The queen uses the different flavors of milk received from different worker ants to produce the search template communication patterns given to the returning worker ants and an output which contains the emerging patterns of more and less desirable milk.

Moving away from the insect metaphor, the mechanics of the first type of agent are basically genetic and well known. The details of the “milking” are as follows. The first type of agents are essentially recording frequency strength data on those parts of the database where they are designed to feed. The second type of agent collects collections of these subsets in a way determined by the search strategy it receives from the third agent type, the queen. The third agent type performs by comparing search strategy results either among search strategies or with a criterion supplied by the researchers. Search strategies can be produced to satisfy a multitude of criteria, including those which results most nearly match a given pattern. One output of the system produced by the third agent is the matched pattern or the collection of strategies which provide interesting variations as defined by the specific marketing objective. The other output produced by the third agent are the search strategies. The agent society is defined in a general way in order to accommodate a wide range of research projects and questions.