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Participatory Interaction Modeling of Online Geographic Decision Making

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Public participation, for example within public decision making contexts meant to choose among alternatives for land, transportation, and water resource improvements within a community, is an important part of exercising democracy. Unfortunately, few people participate because of time and meeting constraints. Online geographic information systems technologies have held great promise for enabling larger groups of residents to engage in decision making; however, designs for software systems have been ad hoc, thus few successes have been demonstrated and/or reported for scaling participation to large numbers of people. Modeling participatory interaction of online public participation geographic decision making is an important basis for scaling participation along three significant dimensions that can improve our understanding of participation. First is scaling the range of the *in-out* dimension from smaller to larger numbers of diverse people. Second is scaling the range of the *down-up* dimension from local to regional areas. Third is scaling the range of the *lesser-greater* dimension from simpler to richer conversations for demonstrating technical competence and breadth of perspective about regional problems.

This project develops a framework for participatory interaction modeling of online public geographic decision making by using three objectives: (1) developing a computationally-based model of public participation that characterizes human-computer-human interaction (HCHI) processes, (2) refining geovisual analytic technique called a “grapevine” for evaluating participatory HCHI data, and (3) developing scaling metrics and performance indicators that quantitatively characterize public participation HCHI processes. The computational model is being developed using a database system that stores data from two previous field experiments. A “grapevine” prototype visualization software is being extended to broaden and deepen representations of HCHI process. Scaling metrics and performance indicators for public participation are being developed that provide a quantitative assessment of the success for online public participation.

The database-based systems model on online public participation provides an empirically-grounded foundation for moving forward with how to (re)design software systems that implement online participatory geographic decision support. The refinement of the grapevine technique extends the opportunity for social-behavioral scientists to more broadly and deeply explore complex social-behavioral systems. The public participation performance indicators provide a measurable form of the creative and transformative contributions to new directions for enhancing social-behavioral systems modeling within participatory interaction modeling. This project benefits society by developing a framework that will help software designers and practitioners construct cyber-enabled geographic decision support systems that can scale potential group participation *out* to very large groups of people, *up* to larger and more diverse parts of society over wider geographic areas, and *greater* to include more robust technical competence within the technical content of the discourse being offered. In addition to those broad-based impacts, the project includes graduate and undergraduate student researchers in geography seminar classes in analysis and overall evaluation about how participatory systems can support disadvantaged and traditionally underrepresented groups. Student research assistants help organize and conduct those classes. Results of the study, in terms of data, presentations, preliminary reports, and publications, are being disseminating via a project web site.