

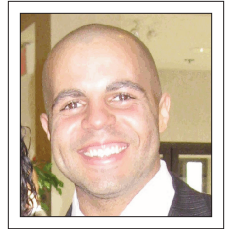
# A SCALABLE GEOWEB TOOL FOR ARGUMENTATION MAPPING

Aaron P. Sani and Claus Rinner

Department of Geography, Ryerson University, Toronto, Ontario

Public participation geographic information systems (PPGIS) support collaborative decision-making in the public realm. PPGIS provide advanced communication, deliberation, and conflict resolution mechanisms to engage diverse stakeholder groups. Many of the functional characteristics of Web 2.0 echo basic PPGIS functions including the authoring, linking, and sharing of volunteered geographic information. However, with the increasing popularity of geospatial applications on the Web comes a need to develop concepts for scalable, reliable, and easy-to-maintain tools. In this paper, we propose a cloud computing implementation of a scalable argumentation mapping tool. The tool also illustrates the opportunities of applying a Web 2.0 model to PPGIS. The searching, linking, authoring, tagging, extension, and signalling (SLATES) functions are associated with PPGIS functionality to produce a participatory GeoWeb tool for deliberative democracy.

Les PPGIS (Public Participation Geographic Information Systems) [systèmes d'information géographique de participation publique] soutiennent la prise de décision coopérative dans le domaine public. Les PPGIS offrent des mécanismes avancés en communication, délibération et résolution de conflits pour faire participer divers groupes d'intervenants. Plusieurs des caractéristiques fonctionnelles du Web 2.0 imitent les fonctions de base des PPGIS, y compris la création, la liaison et le partage de l'information géographique volontaire. Toutefois, avec la popularité croissante des applications géospatiales sur le Web s'ensuit le besoin de mettre au point des concepts pour des outils évolutifs, fiables et faciles d'entretien. Dans cet article, nous proposons la mise en œuvre par l'informatique en nuage d'un outil adaptable de cartographie d'argumentation. L'outil illustre également les possibilités d'application d'un modèle du Web 2.0 aux PPGIS. Les fonctions de recherche, de lien, de création, de marquage, d'extension et de signalisation (SLATES) sont associées à la fonctionnalité des PPGIS pour produire un outil de participation GeoWeb pour une démocratie délibérative.



Aaron P. Sani



Claus Rinner

crinner@ryerson.ca

## 1. Introduction and Background

Sieber [2001] characterized Public Participation Geographic Information Systems (PPGIS) as a “normative field of study” that contains “a bottom-up component of public involvement” (p. 2). More broadly, PPGIS support collaborative decision-making processes in the public realm. Using distributed computing technology, PPGIS can facilitate knowledge exchange towards the resolution of ill-defined spatial decision problems [Jankowski and Nyerges 2001; Balram and Dragicevic 2006]. Ill-defined, or “wicked,” problems are characterized by their inherently ambiguous definitions, objectives, and resolution processes; in addition, these problems are characterized by the difficulty of determining solutions in anything but qualitative terms [Rittel and Webber 1973]. To facilitate the convergence of opinions towards problem resolution, PPGIS seek to offer various modes of communication to decision-makers, which help to develop a common operating picture of the problem domain and its geospatial characteristics. This common operating picture is thought to provide PPGIS users with a joint knowl-

edge base consisting of data relating to the subject matter, which can improve the quality of candidate solutions to the wicked problem. Central to this notion is the engagement of stakeholders, particularly non-GIS savvy laypersons, who participate in online collaboration through highly usable computer interfaces [Jankowski and Stasik 1997; Haklay and Tobón 2003; Sieber 2003].

An argumentation map is a specific example of a PPGIS, one that involves a particularly high level of user contributions through interactions within an online system. The concept of argumentation mapping was proposed by Rinner [2001] to facilitate the geographic referencing of user-generated content (i.e. “arguments”). In the context of Web mapping, the argumentation mapping concept enables linkages between structured discussion and geospatial features, thus going beyond annotated maps and map mashups [Rinner et al. 2008; Rinner and Bird 2009]. The major advantages of this approach are twofold. The first advantage is communicative: Stakeholders,