The Concept of Geographical Area Effect in present scenario

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Abstract :

The present paper examines whether the formal topological characterization of spatial relations between moving geographic regions provides an adequate basis for the human conceptualization of motion events for those regions. The paper focuses on gradual changes in topological relationships caused by continuous transformations of the regions (specifically, translations). Using a series of experiments, the conceptualization and perception of conceptual neighborhoods is investigated. In particular, the role of conceptual neighborhoods in characterizing motion events is scrutinized. The experiments employ a grouping paradigm and a custom-made tool for presenting animated icons. The analysis examines whether paths through a conceptual neighborhood graph sufficiently characterize the conceptualization of the movement of two regions. The results of the experiments show that changes in topological relations—as detailed by paths through a conceptual neighborhood graph—are not sufficient to characterize the cognitive conceptualization of moving regions. The similarity ratings show clear effects of perceptually and conceptually induced groupings such as identity (which region is moving), reference (whether a larger or a smaller region is moving), and dynamics (whether both regions are moving at the same time).

Keywords: Event, structure, perception, Topology, Spatio - temporal reasoning, Conceptual neighborhoods.

Introduction:

The almost ubiquitous access to geographic information has become a commodity owing to affordable and powerful mobile devices, widespread availability of mobile network connectivity, provision of spatial data sets, and services built upon them. Such mobile services employing geographic information, for instance location-based services (LBS) or mobile traffic and tourism related services are increasingly developed and deployed. The acceptance and success though is still lagging behind expectations for different reasons (Reichenbacher 2009). The main hindering factor is the lack of utility due to information mismatch, inadequacy or irrelevance of information and unsatisfying usability because the presentation of information is not adapted to the mobile Internet and designed according to cognitive principles. Missing in the majority of mobile services, including LBS is a broad and comprehensive and theoretically grounded concept of relevance. Although relevance has been studied for long in information science with respect to information retrieval, it has not been investigated under a geographic perspective that is indispensable if dealing with geographic information relevance. Such a notion of relevance is proposed here and termed geographic relevance.

DISTANCE AND GEOGRAPHIC RELEVANCE

Our approach to GR is guided by the basic assumption derived from the first law of geography (Tobler 1970). Other things being equal we assume the shorter the distance in any relevance dimension (space, time, property, etc.), the more relevant an information object is in a given usage context. This becomes intuitively obvious, if we think of the potential of nearer objects to be either perceived, reached (accessibility), to fit into existing knowledge, or to be efficiently used in solving a problem or to be supporting an activity. Apart from spatial distances we propose to also use an abstraction of distance for capturing non-physical distances such as conceptual or semantic distances between the user's activity and the object itself. The combination of a set of "real" and "conceptual" distances should provide a more comprehensive relevance notion. Recent developments in Artificial Intelligence and Data Mining techniques give us the opportunity to better understand the environment described by both spatio-temporal and semantic data. First, the analysis of spatio-temporal clusters and patterns could lead to a broader relevance evaluation, that would take into account not only a single geographic information object (GIO) but also its surroundings. Secondly, Common-Sense Knowledge Bases (Liebermann 2008) could contribute to fill up a part of the knowledge gap between humans and computer systems, i.e. the knowledge that is obvious for humans but missed by computers. These are huge databases that collect relationship between concepts, where this relationship describes some kind of knowledge usually common to everyone, such as "A tourist can visit a museum" or "A mall is for shopping".

REPRESENTATION OF GEOGRAPHIC RELEVANCE

Following the relevance assessment each GIO will possess a value of relevance. A further question is how best to represent this information effectively for users of mobile systems. An overall aim of the representation will be to effectively communicate the concept of relevance to the user. A good conceptual basis for the representation is important (Peuquet 1988). Experimentation has proved physical or conceptual phenomena are cognitively separated at a fundamental level and so representation of them must also be treated differently (MacEachren 1995). GR is a non-physical quality of a real-world entity and so any representation is best classified as conceptual. Raper (2007) describes GR as extending over space. A further consideration is therefore whether this spatial extension is object (discrete) or field like (continuous). Recent research into conceptual theories of spatial representation have suggested that reality is more field like but human perception of the external world is more similar to the discrete view (Liu et al. 2008; Goodchild et al. 2007). There is also some evidence that these differing concepts can coexist (Cova and Goodchild 2002). It is expected that both discrete or continuous concepts will be necessary to fully realise the representation of GR. Which concept is most applicable will depend upon several contextual factors including activity type, real world characteristics of entity, conception of space, computational environment and spatial scale (Paay and Kjeldskov 2005). Theories of representation, activity, spatial cognition, cartography, information seeking behaviour and HCI will be used to fit the representation to the contextual factors.

Geography of the Region

The term "region" has been either viewed as merely a concept and mental construct or a reality that exists in space. According to Dov Nir, these two views can be compatible in "so far as the regional studies are in fact studies of places, spatial relationships and values attached to place and relationship." 1 The classical view of region gave emphasis on the homogeneneity of physical condition of any portion of the earth's surface. Later the term has been associated with a definite portion of earth's surface. And therefore, at present, it is considered as a geographic and aerial unit with certain limits and bounds. Various types of regions have been noticed by the geographers. Where only the physical characteristics of the land are taken into account, the physical geographic regions are highlighted. Where cultural factors are considered as bases for delineation, the socio-cultural regions are reconstructed. Where various criteria come together, we get a "compage".2 The concept of a compage further leads us to the concept of regionalization which is actually "the temporal, spatial or time-space differentiation of regions, either within or between locales"; the locales being the physical regions involved as part of the setting of interaction and having definite boundaries. The interaction between locales points again to the aerial linkage which is necessary for regionalization.

Indian Peninsula: a regional division

Indian subcontinent has three major structural elements or macro-regions or first order regions which is nothing but a physiographic division at the highest level of generalization. These are the Himalayan mountains, the peninsular India and the middling depressions now filled with sediments deposited by the north Indian rivers. All the three macro-regions are divided into meso-regions and all the meso-regions can be classified into microregions. "As the regions based on surface relief features and the drainage basins of rivers have acted as break-points between one region and the other", each region is compelled to develop some specialities which are unique to it and the formation of cultural complex can become of a particular nature. So, first of all, it is necessary to describe the features of peninsular India of which Andhra Pradesh is a part. The Peninsular Plateau consists the largest physiographic division and the oldest part of the country. It is characterized by:- i) hard granites as resistant blocks, metamorphosed under great pressure to form gneisses ii) less intensively altered sedimentary rocks as pleateaus iii) relatively younger, but very ancient sedimentary rocks in dips or basins forming plateaus and scraplands, intersected by waterfalls, particularly in the northern Deccan iv) much younger sediments lying in the long depressions, especially in the east of the peninsula fringed by coastal plains and deltas The northern boundary of peninsular plateau has been formed by the Vindhya, Satpura, Mahadeo and Maikal mountain-ranges.lt is bordered on by the Nilgiri hills, the meeting point of the Eastern and Western Ghats, in the south. These two hill-ranges also surrounded the plateau on the east and west respectively. The coastal region of the Peninsula can broadly be divided into eastern and western coast with the former stretching through Orissa, Andhra and Tamil Nadu and the latter having portions of Gujarat, Maharashtra, Goa, Karnataka and Kerala. In the western coastal area:- i) the portion of Gujarat is drought prone where rainfall is less than 75 cm.; only the southern coastal strip being an exception. The process of settlement has led to large-scale deforestation with only the eastern margins having some forest-cover. ii) the part of Maharashtra Konkan is a lowland Here

ridges and spurs project out from the Western Ghats. Valley bottoms witness intensive rice cultivation while millets and pulses are the main crops in the clearings of the wooded hills. iii) the coast of Goa is occupied by a tiny delta made by the Mandovi river originated from the Western Ghats. iv) the Karnataka section is more hilly than plain. Its northern portion is an extension of the Western Ghats and southern part consists of dissected hills, open valleys and coastal lowlands. v) the coastline of Kerala is emergent, contrary to the rest of the western coast of India, which mostly experienced submergence resulting in several coastal villages as "islands". The eastern coast has also some variations in physiography which are described as follows:-

i) Orissa coast broadly coincides with the M ahanadi delta. Marshes and dunes on the coastal fringe, wide alluvium in the middle and lateritic shelves on the upland margins form its physiography.

ii) The coast of Andhra is mainly formed by the two deltas of the Godavari and the Krishna. In the north, topography tends to be hilly near the sea and in the south is located the Nellore peneplain carved out by the Pennar. (Map 2)

iii) The Tamil Nadu coast is a wide plainland with the Kaveri delta in the middle. To its north, there is alluvium deposited by the palar and Ponnaiyar rivers, and in its south, there remains the plain watered by the Vaigai and other rivers. All the geographers have not marked the sub-regions similarly. While some of them divided the peninsula into some second-order regions like Telengana plateau, Eastern Ghats, Deltaic tract of Orissa, Mahanadi, Brahmani, Baitarani rivers, Andhra coastal plains and Deltaic tract of Krishna and Godavari rivers, Coromandel coast from Krishna delta to the southern tip of the peninsula , there are others who have classified the Peninsula into Central Highlands and Plateaus and the Deccan plateau, the later subdivided into Maharashtra plateau, Karnataka plateau and Tamil Nadu plateau. If only the physiographic features were kept in mind, there is no cause of dividing the Deccan plateau according to the names of the States. But, as the object of geography of today is stretching of social relations over space which has led to the incorporation of sociology, anthropology and cultural studies, the regions are being identified as 'experienced, valued and conceived' by individuals and groups.

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