

Description of the talk in 'Next Generation Cartographers: A cartographic colloquium'

Name: Tong Qin (PhD student)

Affiliation: CartoGIS research group, Geography Department, Ghent University

Title: Visual attention and neuro-cognitive processes in map use

Abstract: Maps as visual abstract information of the geographic environments, have irreplaceable roles in our life. Understanding where we look at the map, and how our brain copes with the daily map tasks, are long-standing challenges for fields of GIScience/Cartography and cognitive science, which help design better/usable maps. State-of-the-art studies on map cognition mainly employ eye-tracking with conventional empirical methods, which only reflect the overt aspects of users' cognitive processes (e.g., visual attention). However, the covert aspects (e.g., neural activities) of the cognitive processes during map use, which are not visible from outside, are still largely unexplored. To close this research gap, my research aims to investigate user's cognitive processes in different map tasks, integrating both overt (e.g., eye movements) and covert (e.g., neural activities) perspectives.

The hypothesis of the study is that different map tasks lead to distinct eye movements and brain activities. The independent variables are four popular map tasks in daily use (i.e., global search; distance comparison; route following and route planning), and the dependent variables are eye movement and brain activities metrics. We have recruited 50 participants and conducted a map-use experiment using eye tracker and Electroencephalography (EEG). The ET and EEG metrics will be compared between tasks to investigate the similarity and differences of the cognitive process.