The lack of empirically-derived guidelines about designing cartographic user experiments

Merve Keskin

NLS
FINNISH GEOSPATIAL
RESEARCH INSTITUTE
FGI

Discussion topic 1

No standardization about the experiment set-up for user studies:

- the number of participants and trials
- the age and gender balance of the participants
- the duration of the experiments
  (considering the task variety and the complexity of the stimuli)
- which methods for which tasks *(esp. for interactive maps)*
- which insights to be derived/explored through the chosen methods

This gap in the methodological aspect in the cartographic experimental design affects our research in many ways:

objectivity

repeatability/reliability

generalizability of the findings

making comparisons between similar studies hard or impossible

Discussion topic 2

The majority of the publications communicates

good results or
successful implementation of methods and theories

so we never fail?

Following may help saving the time and effort devoted to the traditionally embraced trial and error approach.

share not only the best practices, but also the flaws in the experimental design and failures

provide in-depth discussions, lessons learned through experiments

mention methodological and technical problems encountered throughout the user experiments (incl. participants, materials, procedures and analyses)

Discussion topic 3

Lack of guidelines about how to mix existing and new methods while designing empirical research

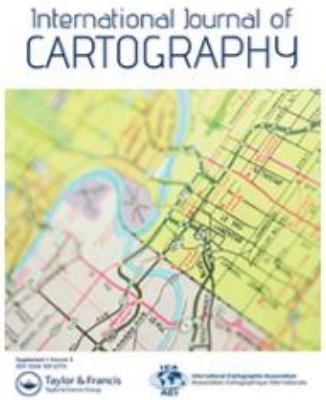
either for user testing

- e.g. EEG, EMG, fMRI, other neurobiological measures (GSR, pulse rate)

or for enhancing the cognition of map users

- e.g. integration of AI and VR as visual aids assisting geo-exploration

Roth et al. (2017) addressed the most issues we discussed today and also the opportunities to meet our methodological needs.



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User studies in cartography: opportunities for empirical research on interactive maps and visualizations

Robert E. Roth, Arzu Çöltekin, Luciene Delazari, Homero Fonseca Filho, Amy Griffin, Andreas Hall, Jari Korpi, Ismini Lokka, André Mendonça, Kristien Ooms & Corné P.J.M. van Elzakker

e.g. interactive maps, combining new methods

Geoinformatica (2019) 23:663–687
https://doi.org/10.1007/s10707-019-00344-3

FeaturEyeTrack: automatic matching of eye tracking data with map features on interactive maps

Fabian Göbel[1] · Peter Kiefer[1] · Martin Raubal[1]

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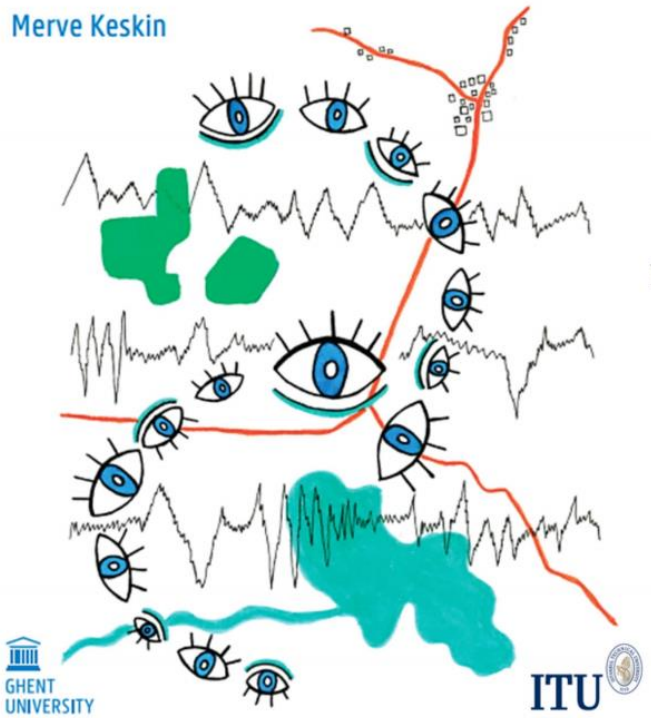

Exploring the Cognitive Processes of Map Users Employing Eye Tracking and EEG

Supervisors : Prof. dr. Philippe De Maeyer
Prof. dr. A. Ozgur Dogru
Co-supervisor : Dr. Kristien Ooms

Take home message

These issues should be discussed more and somehow standardized, if we would like to build a knowledge/know-how that will help the future advancement of our discipline.

We should contribute more on the methodology, comparative analysis, find ways to integrate new methods into cartographic usability research, and most importantly how they can be integrated.

Your input matters

Any literature on

the use of machine learning/AI to design interactive (map) interfaces

- adapting user behaviors
- assisting the understanding of unknown (spatio-)visual phenomena?

«IT'S OK TO BE A CARTOGRAPHER»

Georg Gartner, *Former president of International Cartographic Association (ICA)*

merve.keskin@ugent.be