

## Commission on Cognitive Issues in Geographic Information Visualization

The CogVis Commission was established at the 25<sup>th</sup> ICC in Paris in 2011 and renewed in Rio de Janeiro in 2015. We continue to be an active commission, holding at least one event each year in a variety of locations, typically in conjunction with at least one other Commission.

The overall goals of our Commission in the current term were set through our terms of reference. For each term below, we provide a non-exhaustive list of examples of Commission activities that have worked towards achieving each of these goals.

### Progress Against Terms of Reference: 2015-2019

- Promote the awareness of cognitive issues in cartography, developing human-centered cartographic theory and practice based on sound empirical findings on the use of cartographic displays for spatiotemporal inference and decision-making.

Our commission now includes 216 members from over 34 countries, including all six inhabited continents, making it a truly international Commission. Nevertheless, we are underrepresented in some areas of the world, so improving that situation is an explicit term of reference of the next term of the commission, should our commission be renewed by the General Assembly. We are committed to expanding access to the activities of our Commission both in person by making sure activities are held in different regions and through technological support to enable remote participation in whatever form is possible. To that end, we try to publish our scientific proceedings in open access outlets and will pioneer the use of Zoom videoconferencing technologies at the 2019 workshop on Mobile UX for interested participants who are not able to join us physically and to record at least some components of the meeting.

After the ICC 2019 pre-conference workshops, we will have organized scientific events on four continents, as we are cooperating to hold two workshops in different countries in Asia (Beijing, China and Tokyo, Japan) before ICC 2019. We have assisted with organizing CogVis sessions at ICC 2017 (16 papers, 8 posters) and ICC 2019 (16 papers).

We have organized several workshops or scientific meetings on particular topics, often in collaboration with other commissions (France, 2 x USA, Czechia, China, Japan). We also supported organisation of special sessions at larger meetings in some years (AAG in the USA).

We use various publication types and our website to further disseminate scientific knowledge presented at and/or developed in our workshops and meetings.

Peer-reviewed special issues that have been produced in this term of the commission include:

- Christophe, S. and Çöltekin, A. (eds). (2015). Papers from GeoVIS '15 at ISPRS Geospatial Week [ISPRS Annals and ISPRS Archives](#). [open access]
- Griffin, A.L., Robinson, A.C., and Roth, R.E. (2017). Special issue including a research agenda for interactive cartography. *The International Journal of Cartography*, 3(Supp1), [open access].
- Griffin, A.L. and S. Caquard. (eds). (2018). Special Issue on Maps and Emotions. *Cartographic Perspectives*, 91, <https://cartographicperspectives.org/index.php/journal/issue/view/cp91>, [open access].

- Kubiček, P., and A.L. Griffin. (2019, forthcoming). Special issue of *Geografie Journal* based on papers presented at the ICA Commissions' joint workshop "Atlases, Cognition, Usability" held in Olomouc (CZ) at Palacký University in April 2018. [open access]

Tutorial materials are also made freely available for reuse by members of the community through our webpage at: <https://cogvis.icaci.org/tutorials.html>.

The tutorials page will be updated with new materials following the ICC2019 Pre-conference Mobile UX Workshop in Beijing.

- In conjunction with the Commission on Geovisualization, Commission on Use and User Issues, and Commission on Map Design, develop and publish a research agenda for that outlines major research challenges for interactive cartography that we should work towards addressing as a community.

This ToR was successfully completed with the open-access publication of a special issue of *The International Journal of Cartography* in 2017 (Volume 3, Issue Sup1). The 2015/2016 workshops led to the production of three research agenda papers and an introduction written by the Chairs of the CogVis, Use Users and Usability, and Visual Analytics commissions. Two additional papers written outside of the workshop framework by members of the four commissions and that related to broad research challenges for interactive cartography were also included in the special issue.

- Define short and medium term research goals that fall within the scope of this research agenda and that address key issues associated with building a sound theoretical base to support the construction and use of cognitively adequate and perceptually salient visual displays of geographic information.

The special issue of *The International Journal of Cartography* that included the research agenda papers outlined a number of research goals that can be focused upon in the short- and medium-term.

Some of the papers presented at the 2017 pre-ICC workshop on Maps and Emotion engaged with one of the research goals identified in the Griffin et al. (2017) research agenda paper.

[Opportunity #3: How are individual differences associated with affective and emotional responses to maps? Which design factors are effective in arousing emotional responses that lead to a map user changing his or her attitudes and behaviors?]

These workshop papers have been subsequently published in the recent *Cartographic Perspectives* special issue.

A second research goal identified in the Griffin et al. (2017) research agenda paper was the topic of a commission meeting within the 2018 workshop on "Atlases, Cognition, Usability".

[Opportunity #4: Systematize individual difference definitions to allow studies to be more easily comparable and support meta-analysis of individual difference effects.]

Together with the Use User and Usability Commission, we have discussed practical community actions that could be taken to achieve this research goal and are working towards additional

activities to be undertaken at a workshop in 2020 or 2021 that help to could achieve this outcome, should our commission be renewed.

- Encourage interdisciplinary and international collaboration with cognate disciplines and relevant stakeholders, including other ICA commissions and working groups.

During this term, the commission has collaborated with a number of other ICA Commissions (Art and Cartography, Atlases, Generalisation and Multiple Representation, Location Based Services, Map Design, Topographic Mapping, Use User and Usability Issues, and Visual Analytics) as well as the ISPRS Working Group on Geovisualization, Augmented and Virtual Reality.

### **Flagship results, 2015-2019**

While a full accounting of our Commission's activities can be found on our website (see: <https://cogvis.icaci.org/activities.html> and <https://cogvis.icaci.org/publications.html>), two activities that we would particularly like to highlight include the following:

- The development and publication of the Interactive Cartography Research Agenda special issue. This involved a series of workshops and collaborative writing exercises and included scholars from four continents in the author list. We provided opportunities for both junior and senior scholars to participate and contribute to the shaping of these research agenda papers.
- The Maps and Emotion workshop we ran in collaboration with the ICA Commissions on Art and Cartography and Topographic mapping in Washington DC before ICC 2017 was very successful. It attracted more than 50 participants from a range of countries and disciplines including practicing artists. It has now resulted in a scientific publication that includes papers presented at and based upon activities conducted at the workshop.