中 国 测 绘 学 会

Chinese Society for Geodesy Photogrammetry and Cartography

Chinese Society for Geodesy, Photogrammetry and Cartography

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Prof. Thomas Schulz
Secretary General and Treasurer
International Cartographic Association (ICA)

March 6,2023

Nomination Letter to the International Cartographic Association (ICA)

March 7, 2023

ICA Executive Committee,

On behalf of the Chinese Society for Geodesy Photogrammetry and Cartography, I am proud to nominate Prof. Hua Liao from School of Geographical Sciences, Hunan Normal University, as a Co-Chair of Cognitive Issues in Geographic Information Visualization (CogVis) Commission, International Cartographic Association (ICA). We support Hua to cochair the Commission with Dr. Pyry Kettunen from Finnish Geospatial Research Institute, Finland (point of contact), Prof. Petr Kubicek from Masaryk University, Czechia, and Dr. Tumasch Reichenbacher from University of Zurich, Switzerland.

Prof. Hua Liao majored in cartography and geographic information science (GIScience) and obtained his Doctorate degree from Beijing Normal University in 2019. As a young researcher, he has been actively involved in cognitive issues in GIScience, focusing on user and cognitive issues in map reading, map interaction based on eye tracking, and pedestrian navigation in virtual and real environments. Prof. Hua Liao is administrating and participating in geospatial cognition related

projects from National Natural Science Foundation of China. He has various publications related to CogVis topics and obtained the Award for Scientific and Technological Advancement in GIScience from China Association for Geospatial Industry and Sciences in 2022. His skills, knowledge, achievements, and willingness to serve cartography and GIScience community make him our ICA CogVis Commission Co-Chair nominee.

Thank you for your consideration.

Yours sincerely,

peng zhenzhong

Zhenzhong Peng

Vice President and Secretary General

Chinese Society for Geodesy Photogrammetry and Cartography

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Hua LIAO *Curriculum Vitae*

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EDUCATION

Jun, 2019	Doctor of Science: Cartography and GIS, Beijing Normal University, Beijing, China
Jun, 2014	Master of Science: Cartography and GIS, Beijing Normal University, Beijing, China
Jun, 2011	Bachelor of Science: GIS, Hunan Normal University, Changsha, China

WORK EXPERIENCES

2023 - present	Associate Professor, School of Geographical Sciences, Hunan Normal University
2019 - 2022	Lecturer, School of Geographical Sciences, Hunan Normal University

RESEARCH INTERESTS

user and cognitive issues in map reading, map interaction based on eye tracking, and pedestrian navigation in virtual and real environments

JOURNAL PUBLICATIONS

He, B., Dong, W., **Liao, H.**, Ying, Q., Shi, B., Liu, J. & Wang, Y. (2023). A geospatial image based eye movement dataset for cartography and GIS. Cartography and Geographic Information Science, 1-16. doi:10.1080/15230406.2022.2153172.

Liao, H., Dong, W. & Zhan, Z. (2022). Identifying Map Users with Eye Movement Data from Map-Based Spatial Tasks: User Privacy Concerns. Cartography and Geographic Information Science,49(1), 50-69. doi: https://doi.org/10.1080/15230406.2021.1980435.

Liao, H., Zhang, C., Zhao, W. & Dong, W. (2022). Toward Gaze-Based Map Interactions: Determining the Dwell Time and Buffer Size for the Gaze-Based Selection of Map Features. ISPRS International Journal of Geo-Information,11(2), 127. doi: https://doi.org/10.3390/ijgi11020127.

Liao, H., Zhao, W., Zhang, C. & Dong, W. (2022). Exploring Eye Movement Biometrics in Real-World Activities: A Case Study of Wayfinding. Sensors,22(8), 2949. doi: https://doi.org/10.3390/s22082949.

Liao, H., Zhao, W., Zhang, C., Dong, W. & Huang, H. (2022). Detecting Individuals' Spatial Familiarity with Urban Environments Using Eye Movement Data. Computers, Environment and Urban Systems,93, 1-12. doi: https://doi.org/10.1016/j.compenvurbsys.2022.101758.

Dong, W., Qin, T., Yang, T., **Liao, H.**, Liu, B., Meng, L. & Liu, Y. (2022). Wayfinding Behavior and Spatial Knowledge Acquisition: Are They the Same in Virtual Reality and in Real-World Environments? Annals of the American Association of Geographers, 112(1), 226-246. doi:10.1080/24694452.2021.1894088.

Dong, W., **Liao, H.**, Liu, B., Zhan, Z., Liu, H., Meng, L. & Liu, Y. (2020). Comparing pedestrians' gaze behavior in desktop and in real environments. Cartography and Geographic Information Science,47(5), 432–451. doi: https://doi.org/10.1080/15230406.2020.1762513.

Dong, W., Yang, T., **Liao, H.** & Meng, L. (2020). How does map use differ in virtual reality and desktop-based environments? International Journal of Digital Earth, 13(12), 1484-1503.

Dong, W., Zhan, Z., **Liao, H.**, Meng, L. & Liu, J. (2020). Assessing Similarities and Differences between Males and Females in Visual Behaviors in Spatial Orientation Tasks. ISPRS International Journal of Geo-Information, 9(2), 115. doi:10.3390/ijgi9020115.

Dong, W., Qin, T., **Liao, H.**, Liu, Y. & Liu, J. (2020). Comparing the roles of landmark visual salience and semantic salience in visual guidance during indoor wayfinding. Cartography and Geographic Information Science, 47(3), 229-243. doi:10.1080/15230406.2019.1697965.

Liao, H., Dong, W., Huang, H., Gartner, G. & Liu, H. (2019). Inferring user tasks in pedestrian navigation from eye movement data in real-world environments. International Journal of Geographical Information Science,33(4), 739–763. doi: https://doi.org/10.1080/13658816.2018.1482554.

Liao, H., Wang, X., Dong, W. & Meng, L. (2019). Measuring the influence of map label density on perceived complexity: A user study using eye tracking. Cartography and Geographic Information Science,46(3), 210–227. doi: https://doi.org/10.1080/15230406.2018.1434016.

Wang, C., Chen, Y., Zheng, S. & **Liao, H.** (2018). Gender and Age Differences in Using Indoor Maps for Wayfinding in Real Environments. ISPRS International Journal of Geo-Information, 8(1), 11. doi:10.3390/ijgi8010011.

Liao, H.& Dong, W. (2017). An exploratory study investigating gender effects on using 3D maps for spatial orientation in wayfinding. ISPRS International Journal of Geo-Information,6(3), 1-19. doi: https://doi.org/10.3390/ijgi6030060.

Liao, H., Dong, W., Peng, C. & Liu, H. (2017). Exploring differences of visual attention in pedestrian navigation when using 2D maps and 3D geo-browsers. Cartography and Geographic Information Science,44(6), 474-490. doi: https://doi.org/10.1080/15230406.2016.1174886.

Liu, Z., Anderson, B., Yan, K., Dong, W., **Liao, H.** & Shi, P. (2017). Global and regional changes in exposure to extreme heat and the relative contributions of climate and population change. Scientific reports, 7, 43909.

Dong, W., Zhang, S., **Liao, H.**, Liu, Z., Li, Z. & Yang, X. (2016). Assessing the effectiveness and efficiency of map colour for colour Impairments using an eye-tracking approach The Cartographic Journal, 53(2), 166-176. doi:10.1179/1743277413Y.0000000053.

Liao, H., Dong, W., Liu, H. & Ge, Y. (2015). Towards Measuring and Visualizing Sustainable National Power—A Case Study of China and Neighboring Countries. ISPRS International Journal of Geo-Information,4(3), 1672-1692. doi: https://doi.org/10.3390/ijgi4031672.

Dong, W., Li, X., Wang, P., **Liao, H.**, Wang, X., & Wang, Q. (2015) The Effects of Weather Factors on Hand, Foot and Mouth Disease in Beijing. Scientific Reports. DOI: https://doi.org/10.1038/srep19247.

Chen, J., Dong, W., Li, R., **Liao, H**., & Cheng Y. (2015) A GIS Perspective for Borderlands Modelling and Understanding: Challenges and a Research Agenda. ISPRS International Journal of Geo-Information, 6, 661-676. DOI: https://doi.org/10.3390/ijgi4020661.

Dong, W., Liu, Z., **Liao, H.**, & Tang, Q. (2015) Global Human Health Sustainability Challenges from Heat Risk under the New IPCC Scenarios. Climatic Change, 130(4): 505-518. DOI: https://doi.org/10.1007/s10584-015-1372-8.

Dong, W., Liu, Z., **Liao, H.**, Tang, Q. & Li, X.e. (2015). New climate and socio-economic scenarios for assessing global human health challenges due to heat risk. Climatic Change, 130, 505-518.

Dong, W., Z. Liu, L. Zhang, Q. Tang, **H. Liao** & X. e. Li (2014) Assessing Heat Health Risk for Sustainability in Beijing's Urban Heat Island. Sustainability, 6, 7334-7357. DOI: https://doi.org/10.3390/su6107334.

Dong, W., **Liao, H.**, Xu, F., Liu, Z., & Zhang, S. (2014). Using eye tracking to evaluate the usability of animated maps. Science China Earth Sciences, 57(3): 512-522. DOI: https://doi.org/10.1007/s11430-013-4685-3.

Dong, W., **Liao, H.**, Roth, R.E., & Wang, S. (2014). Eye-tracking to Explore Potential of Enhanced Imagery Basemaps in Web Mapping. The Cartographic Journal, 51(4): 313-329.
DOI: https://doi.org/10.1179/1743277413Y.0000000071.

董卫华, **廖华***, 詹智成, 刘兵, 王圣凯 & 杨天宇 (2019). 2008年以来地图学眼动与视觉认知研究新进展. 地理学报, 74(3), 599-614. doi:10.11821/dlxb201903015.

周秋文, 杨胜天, **廖华**, 马龙生, 韦小茶 & 颜红 (2016). 地缘环境单元划分方法及实例研究. 世界地理研究, 25(4), 58-66.

WORKSHOP PAPERS

Liao, H. & Dong, W., (2019). Challenges of Using Eye Tracking to Evaluate Usability of Mobile Maps in Real Environments[online]. ICA Workshop on User Experience Design for Mobile Cartography: Setting the Agenda, July 11 & 12, 2019, Beijing, China. Available from: https://use.icaci.org/wp-content/uploads/2018/11/LiaoDong.pdf.

Liao, H., Dong, W., Gartner, G. & Liu, H., (2018). Identifying user tasks in map based-pedestrian navigation from eye tracking data. In: P. Kiefer, Huang, H., Van de Weghe, N. & Raubal, M. eds. Adjunct Proceedings of the 14th International Conference on Location Based Services, 14-17 Jan 2018 Zurich, Switzerland 141-146. doi: https://doi.org/10.3929/ethz-b-000225606.

Liao, H., Peng, C., Dong, W. (Oct, 2013). Using Eye Tracking to Evaluate the Usability of Maps for Pedestrian Navigation. Beijing: 14th National Seminar of Youth Geographers. (in Chinese)

Liao, H., Dong, W. (Oct, 2014). Eye Tracking Based User Visual Search Behaviour Analysis for Map Reading. Xuzhou: Chinese Annual Meeting of GIS Theories and Methods 2014. (in Chinese)

AWARDS

Aug, 2022	Award for Scientific and Technological Advancement in GIScience (5/5), China Association for Geospatial Industry and Sciences
Nov, 2013	National Scholarship, Ministry of Education, P.R. China
Nov, 2010	Encouragement Award of Application Development Event, ESRI China
Jun, 2009	National Encouragement Scholarship, Hunan Provincial Department of Education

Last update: 7 March 2023

March 9, 2023

Declaration

I attest that I am willing and able to serve as the co-Chair for the Cognitive Issues in Geographic Information Visualization (CogVis) Commission of the International Cartographic Association (ICA) in the upcoming term (2023-2027).

Hua Liao

(signature)
Hua LIAO, PhD, Associate Professor (He/His)
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Cognitive Issues in
Geographic Information Visualization (CogVis)
Proposed Terms of Reference:
2023–2027

Pyry Kettunen, Petr Kubicek, Tumasch Reichenbacher, Hua Liao

February 2023

The overall goals of CogVis from 2023–2027 will be to:

- Foster 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 spatio-temporal inference and decision-making.

- Develop events and activities that explore key issues relevant to building innovative maps that work, including those in 3D and immersive environments and those that support human/machine cognition and collaboration (including artificial intelligence).

- Continue engagement with standards organisations (e.g., Open Geospatial Consortium - OGC) to use knowledge from our Commission to positively influence and contribute to standards related to maps and decision making.

- Encourage interdisciplinary and international collaboration with cognate disciplines and relevant stakeholders, including those internal to the ICA (e.g., other Commissions and Working Groups) and external to the ICA (e.g., International Association of Chinese Professionals of Geographic Information Science - CPGIS, ISPRS Working Groups, AGILE).

- Actively seek to encourage more participation in the Commission from researchers in the African, South American, and Asia-Pacific regions, which are currently underrepresented among our membership. We also seek, insofar as possible, to also open participation through electronic means, in workshops by using technologies such as Zoom to livecast and record events to improve access for those who cannot physically travel.