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Prof. Thomas Schulz

Secretary General and Treasurer

International Cartographic Association (ICA)

March 7, 2023

RE: New ICA Commission on Digital Transformation of National Mapping Agencies

ICA Executive Committee,

I am writing in response to Professor Bin Jiang's proposal for the establishment of a new International Cartographic Association (ICA) Commission focused on the digital transformation of national mapping agencies. As Chair of the ICA Working Group on Digital Transformation of National Mapping Agencies and with several important roles held at another ICA Commission and Working Group since 2005, Professor Jiang has made significant contributions to the development of the organization and gained rich experience in its operation.

The proposed new commission aims to promote international technological innovation and exchanges in the fields of surveying and mapping, geographic information science, remote sensing, and related areas. Professor Jiang's leadership as Chair will also encourage Chinese scientists to participate more actively in ICA activities, further enhancing the organization's global reach and impact.

I strongly support Professor Jiang's proposal and believe that the new commission will play an invaluable role in the development of ICA. Please let me know if you have any questions.

Sincerely,

Zhenzhong Peng

Vice President and Secretary General

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A proposal for a new ICA commission on digital transformation of national mapping agencies

Over the last 50 years, national mapping agencies (NMAs) have fulfilled the transition from paper maps to national geodatabases through the first digital transformation, digitization. This shift has made maps and mapping tools ubiquitous in our daily lives, and without it, tools like Google Maps would not exist. However, NMAs are now facing new challenges in the era of big data, AI/deep learning, and cloud computing, which require a second digital transformation - digitalization - to stay competitive in the industry.

The second digital transformation involves converting big data into geographic knowledge for the purposes of spatial planning and decision-making, solving unsolved mapping problems, such as fully automatic map generalization. It is crucial for NMAs to undergo this transformation to survive the big data era, as the emergence of open sources like OpenStreetMap poses a threat to their relevance. NMAs also need to be able to define their societal role in a rapidly evolving field of collecting geographic knowledge and map making, and express it in an understandable manner to decision makers. Through this transformation, NMAs can continue to prosper for decades to come.

To address these challenges and based on two-year ICA working group activities, a new International Cartographic Association (ICA) commission on digital transformation of national mapping agencies is to be established. This new ICA commission aims to facilitate the digital transformation of NMAs in the era of big data, advocating and promoting new ways of mapping in a cloud or mobile computing environment. The commission will also explore how to harness emerging technologies to enable NMAs to deliver better and more up-to-date maps and data services for their users and society.

The commission's mission is closely related to those of other commissions, and collaboration and cooperation within the ICA community and beyond are strongly encouraged. The commission is committed to ensuring the survival and continued prosperity of NMAs in the era of big data through the second digital transformation.

Curriculum Vitae (Bin JIANG)
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Dr. Bin Jiang is Professor of Urban Informatics at the Hong Kong University of Science and Technology (Guangzhou), China, and previously Professor of GeoInformatics at the University of Gävle, Sweden. He founded in 2007 the *International Cartographic Association (ICA) Commission on Geospatial Analysis and Modeling*, and had since been the sole chair, chair, and vice-chair for 12 years. He founded in 2020 the *ICA Working Group on Digital Transformation* and has since been acting as chair. From 2009–2014 he was the European associate editor of the international journal *Computers, Environment, and Urban Systems*. He is currently Associate Editor of three international journals and an editorial member of over 20 international journals, including *International Journal Geographical Information Science*. He is currently honorary director of BeijingCityLab, a member of the Scientific Committee of the *International Society of Biourbanism*, and a member of the European Advisory Board of *Building Beauty* master program in architecture. He used to be a visiting professor (2016) of the *University of Vienna*, and visiting fellow (2012) of the *Japan Society for the Promotion of Science*.

Education:
1992-09 till 1996-02, Ph.D. in GeoInformatics, Utrecht University, The Netherlands
1988-09 till 1991-06, M.Sc., Remote Sensing and Computer Cartography, Chinese Academy of Surveying and Mapping, China
1984-09 till 1988-06, B.S. in Cartography, Wuhan University, China

Postdoctoral experience：
1996-03 till 1996-12, Free University of Berlin, Germany

Research and academic work experience：
2023-01 till now, Professor of Urban Informatics, Hong Kong University of Science and Technology (Guangzhou), China
2007-04 till 2022-12, Professor of GeoInformatics, Division of GIScience, University of Gävle, Sweden.
2006-02 till 2008-09, Assistant Professor of GeoInformatics, Land Surveying and Geoinformatics, The Hong Kong Polytechnic University, China.
2005-11 till 2007-03, Associate Professor of GeoInformatics, Division of Geomatics, University of Gävle, Sweden.
2000-01 till 2005-10, Senior Lecturer of Cartography and GIS, University of Gävle, Division of Geomatics, Sweden.
1997-01 till 1999-12, Senior Research Fellow, Center for Advanced Spatial Analysis, University College London, UK.
1991-07 till 1992-08, Research Assistant, Division of Cartography, Chinese Academy of Surveying and Mapping, China.

Scientific research projects in the past five years:
2017-09 till 2023-07, BIGDATA Project: Geospatial analysis of big data based on fractal geometry and power law statistics, funded by the University of Gävle, 2.5 million SEK.
2018-10 till 2021-09, City Ventilation, funded by the Swedish Research Council FORMAS, 5.35 million SEK.
2018-01 till 2020-12, Alexander project: Automated generation of living structure for biophilic urban design, funded by the Swedish Research Council FORMAS, 2.88 million SEK.
2019-03 till 2019-12, LifeCities: Investigating the degree of life in cities for sustainable development, 0.49 million SEK.

Representative publications

Jiang B. and Rijke C. (2023), Living images: A recursive approach to computing the structural beauty of images or the livingness of space, *Annals of the Association of American Geographers*, x(xx), 1-19.

Jiang B. and Huang J.-T. (2021), A new approach to detecting and designing living structure of urban environments, *Computers, Environment and Urban Systems*, 88(101646), 1-10.

Jiang B. and Ren Z.(2019), Geographic space as a living structure for predicting human activities using big data, *International Journal of Geographical Information Science*, 33(4), 764-779.

Jiang B. and Yin J. (2014), Ht-index for quantifying the fractal or scaling structure of geographic features, *Annals of the Association of American Geographers*, 104(3): 530-541.

Jiang B. (2013), The image of the city out of the underlying scaling of city artifacts or locations, *Annals of the Association of American Geographers*, 103(6), 1552-1566.

Other representative outcomes

Jiang B. (2019), Methods, apparatus and computer program for automatically deriving small- scale maps, USA Patent, US 10,319,260 B2

Jiang B, (2022), Keynote: Computing the structural beauty that exists in the underlying living structure of space or big data, *The 22nd International Conference on Computational Science and Its Applications*, July 4-7, 2022, Malaga, Spain.

Jiang B. (2919), Keynote: Living structure as the scientific foundation of spatial DATA science, *2019 Seoul Big Data Forum*, November 7-8, 2019, Seoul, South Korea

Jiang B. (2018), Keynote: Scaling law and Tobler's law for characterizing asymmetries in geography, *FEAS 2018: First European Asymmetry Symposium*, March 15-16, 2018, Nice, France.

Jiang B. (2017); Keynote: Geospatial big data and living structure for better understanding and making cities, *ILUS 2017: International Land Use Symposium 2017*, November 1-3, Dresden, Germany.

Jiang B. (2017), Keynote: Why topology matters in spatial cognition and analysis?, *COSIT 2017: 13th International Conference on Spatial Information Theory*, September 4-8, 2017, L'Aquila, Italy.

To whom it may concern

Re: ICA Commission of Digital Transformation of National Mapping Agencies

I am writing to express my willingness in serving as the Chair of the ICA Commission on Digital Transformation of National Mapping Agencies for the next four years, pending approval by the ICA executive committee.

With my experience and knowledge in digital transformation and mapping, I believe I can make a valuable contribution to the commission and its goals. I am committed to advancing the use of AI and big data technologies in national mapping agencies, and I am eager to collaborate with other members of the commission to achieve this objective.

If you require any additional information, please do not hesitate to contact me. I look forward to the opportunity to serve as Chair and to work with the commission to promote digital transformation in national mapping agencies.

Sincerely,

Bin Jiang

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Terms of reference

- To facilitate NMAs for their second transformation in the big data era
- To promote NMA alignment to the United Nations' new Integrated Geospatial Information Framework
- To network geospatial researchers who are interested in the digital transformation of NMAs
- To organize sessions and workshops for exploring related issues on new ways of mapping, AI/deep learning, new maps/data services in a cloud/mobile environment
- To communicate, disseminate, and publish as appropriate the efforts and findings of the commission through various communication and publication channels