

# 20th International Conference on Geoinformation and Cartography

Zagreb and online, September 5–7, 2024

The 20th International Conference on Geoinformation and Cartography was held in Zagreb and online on 5–7 September 2024. By organizing this conference, the Croatian Cartographic Society and the Faculty of Geodesy, University of Zagreb wanted to contribute to the development of geoinformatics, cartography, geodesy, geography and related fields with a special emphasis on new achievements. A wide range of topics and renowned invited speakers guaranteed the interesting nature of the lectures and a modern approach.

79 people registered for the conference.

The members of the Organizing Committee were: Miljenko Lapaine, Marija Brajković, Mia Maras, Dubravka Mlinarić, Marijo Seničić, Krunoslav Špoljar, Marina Viličić, Martina Triplat Horvat and Robert Župan.

The sponsors were the International Cartographic Association (ICA) and the Ministry of Science, Education and Youth (MZOM).

Geomatika d.o.o. was the gold sponsor, and the other sponsors were GeoModeling d.o.o., ListLabs d.o.o. and Zavod za fotogrametriju d.d.

The invited speakers were:

**Prof. Emer. Wolfgang Kainz,**



Professor Emeritus of Cartography and Geographic Information Sciences at the Department of Geography and Regional Research, University of Vienna, Editor-in-Chief of the ISPRS International Journal of Geo-Information, former President of the Austrian Cartographic Commission.



**Prof. Emer. Evangelos Livieratos** of the Faculty of Technology of the Aristotle University of Thessaloniki (AUTH).

Elected Full Professor (1979) at the Department of Higher Geodesy and Cartography, Faculty of Rural Geodesy, Faculty of Technology, AUTH. Author, organizer and Chairman of the ICA Digital Cartographic Heritage Committee (2005–2019). He is the founder and editor of the international web journal e-Perimtron.



**Prof. Dr. László Zentai** is Professor and Head of the Department of Cartography and Geoinformatics at the Eötvös Loránd University in Budapest.

He is the Vice-Rector of the University. He was the Secretary General and Treasurer of the ICA. He is an active orienteering athlete and a member of the International Orienteering Federation Council.

The first two days, 5 and 6 September 2024, the following lectures were held:

Dino BEČIĆ: Spatial Patterns and Housing Inequalities – An Exploratory Analysis in the City of Zagreb  
 Wolfgang KAINZ: From GIS and Remote Sensing to Spatial Data Science  
 Krisztián KERKOVITS: Low-Distortion Authalic Sphere for Regional Maps  
 Vinka KOLIĆ BUBIĆ, Valerija FILIPOVIĆ: Hydrographic Institute of the Republic of Croatia – Development and Activities

Miljenko LAPAINE: Hammer Projection  
 Evangelos LIVIERATOS: Importance of Cartographic Literacy in GI Science: Maps vs Images

Tome MARELIĆ: Are Portolan Charts and Portolan Mile Geometrically Rooted in Classical Antiquity? Cartometric Analysis of the Carte Pisane, Cortona, Avignon, Lucca Charts, and Al-Shirazi's "Greek Map"

Damir MEDAK, Mario MILER, Luka RUMORA, Dino DOBRINIĆ, Ivan BRKIĆ: The First LiDAR Survey of Croatia – a 3D model for a webGIS

Dubravka MLINARIĆ: Teaching Cartography at the Academic Level in Croatia: Preliminary Results

Dušan PETROVIĆ: Archiving Analogue Material of the Basic Topographic Plan of Slovenia

Denis RADOŠ, Branimir VUKOSAV, Mislav Stjepan ČAGALJ: Ergonyms Associated with the Name "Dalmatia" in Croatia

Julijan SUTLOVIĆ: Case Study of Geopolitical Discourse Conflict: Lokrum Island's Geographical Name

Atima THARATIPYAKUL, Haw Yuh LOH, Simon T. PERRAULT, Yong WANG, Michael T. GASTNER: Effectiveness of Large-Language Models in Recognizing Spatially Intensive Statistical Data

László ZENTAI: European Higher Education Area, European University Alliances: Chance for Inter- and Multidisciplinary University Programmes, Chance for Cartography and Geoinformatics

Robert ŽUPAN, Stanislav FRANGEŠ: Web Cartography Using AI

On the third day of the conference, an expert visit to Medvednica was organised.

# 20th International Conference on Geoinformation and Cartography

Zagreb i online, 5–7. rujna 2024.

U Zagrebu i online održana je 5–7. rujna 2024. godine 20. međunarodna konferencija o geoinformacijama i kartografiji. Organiziranjem te konferencije Hrvatsko kartografsko društvo i Geodetski fakultet Sveučilišta u Zagrebu željeli su doprinijeti razvoju geoinformatike, kartografije, geodezije, geografije i srodnih područja s posebnim naglaskom na nova dostignuća. Širok izbor tema i renomirani pozvani predavači jamčili su zanimljivost predavanja i suvremen pristup.

Članovi Organizacijskog odbora bili su: Miljenko Lapaine, Marija Brajković, Mia Maras, Dubravka Mlinarić, Marijo Seničić, Krunoslav Špoljar, Marina Viličić, Martina Triplat Horvat i Robert Župan.

Pokrovitelji su bili Međunarodno kartografsko društvo (International Cartographic Association – ICA) i Ministarstvo znanosti, obrazovanja i mladih (MZOM).

Geomatika d.o.o. bila je zlatni sponzor, a drugi sponzori bili su GeoModeling d.o.o., ListLabs d.o.o. i Zavod za fotogrametriju d.d.

Pozvani predavači bili su:



**Prof. Emer. Wolfgang Kainz**, profesor emeritus kartografije i geografskih informacijskih znanosti s Odjela za geografiju i regionalna istraživanja Sveučilišta u Beču, glavni urednik časopisa ISPRS International Journal of Geo-Information, bivši predsjednik Austrijske kartografske komisije.



**Prof. Emer. Evangelos Livieratos** s Tehničkog fakulteta Aristotelovog sveučilišta u Solunu (AUTH). Izabran u zvanje redovitog profesora (1979) na Katedri za višu geodeziju i kartografiju Ruralno-geodetskog fakulteta Tehničkog fakulteta AUTH. Autor, organizator i predsjedavajući Povjerenstva za digitalnu kartografsku baštinu ICA-e (2005-2019). Osnivač i urednik međunarodnog web časopisa e-Perimeteron.



**Prof. Dr. László Zentai** je profesor i voditelj Odsjeka za kartografiju i geoinformatiku na Sveučilištu Eötvös Loránd u Budimpešti. Rektor je sveučilišta. Bio je glavni tajnik i blagajnik ICA-e. Aktivni je orijentacijski sportaš i član Vijeća Međunarodne orijentacijske federacije.

Prva dva dana, 5. i 6. 9. 2024. održava su ova predavanja:

Dino BEČIĆ: Spatial Patterns and Housing Inequalities – An Exploratory Analysis in the City of Zagreb

Wolfgang KAINZ: From GIS and Remote Sensing to Spatial Data Science  
Krisztián KERKOVITS: A Low-Distortion Authalic Sphere for Regional Maps

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Robert ŽUPAN, Stanislav FRANGEŠ: Web Cartography Using AI

Trećeg dana konferencije organiziran je stručni posjet na Medvednicu.



Medvednica is a mountain in central Croatia, just north of Zagreb, marking the southern border of the historic region of Zagorje. Its highest peak, at 1,035 m is Sljeme. Most of the area of Medvednica is a nature park. During the Miocene and the Pliocene, the mountain was an island within the Pannonian Sea.

The tour departed on Saturday, 9 September 2024 at 10 a.m. from the first station of the cable car.

On Sljeme, at the top of Medvednica, we saw the place where a trigonometre used to be and a wooden pyramid above it. The first wooden

structure on Sljeme was erected in 1869 and served as a trigonometre of the first order. The public was able to enjoy the view from Sljeme for the first time in 1870, when the forest on its summit was completely cut down. In the same year, German surveyor Nitzl brought Zagreb merchants Lovrenčić and Meško to Sljeme, who were so delighted by the view from the mountain that they decided to build a solid wooden pyramid at the summit. Although only 4 meters high, the small pyramid was the first object in the history of Croatian mountaineering!

As the forest grew, so did the pyramid: in 1877, a new 8-m-high wooden structure was built, and in 1889, it was replaced by a 12-m iron lookout tower. With the construction of the first iron TV tower on Sljeme in 1960, the pyramid became redundant, so it was moved to Japetić in Samoborska Gora, where it still welcomes mountaineers today. In 1973, a new TV tower was designed. The new Sljeme tower was conceived as a paradise for visitors looking for distant views, with an elevator that would take them up 81 m to an open observation deck or to a slightly lower cafe with a view of all corners of the world. There was even a luxury restaurant with a rotating platform in the plan, which was never built. Unfortunately, the tower was only open to visitors for less than two

years, after which visitors to Sljeme had to make do "merely" with the view of Zagorje from the viewpoint on the top of the mountain. Today, the OIV (Odašiljači i veze / Digital signals and networks) Sljeme tower is one of the symbols of Zagreb, it is the trademark of Medvednica, and the highest tourist point of the Croatian capital, well worth visiting and experiencing. It is only 50 m away from the top station of the new, modern Sljeme cable car.

The Tomislavov Dom hotel represents a masterpiece of Croatian and international architecture of the 1930s. It was built in 1937 according to architect Stjepan Planić's idea as a 4-storey building perfectly integrated into the natural environment thanks to the Y floor plan, the first of its kind in Croatia and among the first in Europe. Tomislavov Dom has a glazed dining room and a large terrace for sunbathing in the western wing, an example of the harmonious use of different materials (stone and timber, concrete and glass), characteristic of the Zagreb school of modern architecture between the two world wars. Lunch was served at the Tomislavov Dom hotel at 1 pm. We returned to the city by cable car in the afternoon.

The detailed conference programme and abstracts are available at [www.kartografija.hr](http://www.kartografija.hr)

*Miljenko Lapaine* ■

**Pokrovitelji**  
Under the Auspices of



Međunarodno kartografsko društvo  
International Cartographic Association



Ministarstvo znanosti, obrazovanja i  
mladih (MZOM)  
Ministry of Science, Education and  
Youth (MZOM)

Medvednica je planina u središnjoj Hrvatskoj, sjeverno od Zagreba, koja označava južnu granicu povijesne regije Zagorje. Najviši vrh na nadmorskoj visini od 1035 m je Sljeme. Veći dio područja Medvednice je park prirode. U miocenu i pliocenu planina je bila otok unutar Panonskog mora.

Polazak ture bio je u subotu, 9. rujna 2024. u 10 sati ispred početne stanice žičare.

Na Sljemeni, vrhu Medvednice, vidjeli smo mjesto gdje su nekada bili trigonometar i drvena piramida iznad njega. Prva drvena građevina na Sljemeni podignuta je 1869. godine i služila je kao trigonometar I. reda. Građani su prvi put mogli uživati u pogledu sa Sljemena 1870. godine, kada je šuma na njegovom vrhu potpuno posječena. Iste godine njemački geodet Nitzl na Sljeme doveo zagrebačke trgovce Lovrenčića i Meška, koje je pogled s planine toliko oduševio da su na njezinu vrhu odlučili

sagraditi čvrstu drvenu piramidu. Iako visoka samo 4 metra, ta je piramida bila prvi objekt u povijesti hrvatskog planinarstva!

Kako je rasla šuma, rasla je i piramida: 1877. godine sagrađena je nova drvena građevina visoka 8 m, a 1889. zamijenjena je željeznim vidikovcem od čak 12 m. Izgradnjom prvog željeznog TV tornja na Sljemeni 1960. godine piramida je postala suvišna pa je prešljena na Japetić u Samoborskoj gori,

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gdje i danas dočekuje planinare. Godine 1973. projektiran je novi TV toranj. Novi Sljemenski toranj zamišljen je kao raj za posjetitelje željne pogleda u daljinu, s liftom koji bi ih odveo na 81 metar visine do otvorenog vidikovca ili do nešto nižeg kafića s pogledom na sve strane svijeta. Čak je u planu bio i luksuzni restoran s rotirajućom platformom, koji nikada nije izgrađen. Nažalost, toranj je za posjetitelje bio otvoren samo nepune dvije godine, nakon čega su se posjetitelji Sljemena morali zadovoljiti pogledom na Zagorje s vidikovca na vrhu planine. Sljemenski toranj OIV (Odašiljači i veze) danas je jedan od simbola Zagreba, zaštitni znak Medvednice i najviša turistička točka hrvatske metropole koju vrijedi posjetiti i doživjeti. Udaljen je samo 50 m od gornje stanice nove, moderne sljemenske žičare.

Hotel Tomislavov dom je remek djelo hrvatske i svjetske arhitekture tridesetih godina prošlog stoljeća. Izgrađen je 1937. godine prema ideji arhitekta Stjepana Planića kao četverokatna zgrada savršeno uklopljena u prirodni okoliš zahvaljujući tlocrtu u obliku slova Y, prva takve vrste u Hrvatskoj i među prvima u Europi. Tomislavov dom ima ostakljenu blagovaonicu i veliku terasu za sunčanje u zapadnom traktu, primjer skladne upotrebe različitih materijala (kamen i drvo, beton i staklo) karakteristične za zagrebačku školu moderne arhitekture između dva rata. U Tomislavovu domu uživali smo u finom ručku. Povratak u grad žičarom bio je u poslijepodnevnim satima.

Za konferenciju je bilo prijavljeno 79 osoba. Budući da je konferencija bila uključena u program stručnog usavršavanja ovlaštenih inženjera geodezije HKOIG-a, sudionicima konferencije priznato je za sudjelovanje 7 akad. sati iz područja 2.

Detaljan program konferencije i sažetci dostupni su na [www.kartografija.hr](http://www.kartografija.hr)

Miljenko Lapaine ■