

# PRIHODNOST GEODEZIJE THE FUTURE OF SURVEYING

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*glavna in odgovorna urednica | Editor-in-chief*

Drage bralke in bralci Geodetskega vestnika! Pred nami je prva številka letnika 2021, ki prinaša zanimive prispevke s širokega geodetskega in geoinformacijskega področja. Verjamem, da boste našli marsikatero zanimivo vsebino tako med raziskovalnimi in strokovnimi članki kot med novicami iz stroke in društev.

Tokrat se v uvodniku dotikam ravno »širine« našega raziskovalnega in strokovnega področja. Ne le v Sloveniji, ampak tudi na mednarodni ravni je trenutno zaslediti več razprav o prihodnosti geodezije. Pred kratkim so tako vodje komisij mednarodne zveze geodetov FIG razpravljali o globalnih in tehnoloških silnicah, ki vidno vplivajo na razvoj geodetske stroke. Jasno je, da postajajo geoprostorski podatki skupaj s celotno infrastrukturo za pridobivanje in rabo geoprostorskih informacij eni izmed temeljev delovanja naše družbe. Brez ustreznih informacij ne moremo sprejemati kakovostnih odločitev niti spremljati napredka glede na mednarodno sprejete razvojne usmeritve, kot sta zeleni razvoj, na evropski ravni poznan tudi kot zeleni dogovor, in trajnostni razvoj.

Med globalnimi silnicami, ki bodo močno vplivale na razvoj geodetske stroke, moramo zagotovo omeniti pester prostorski razvoj z urbanizacijo, vse močnejšo soodvisnostjo urbanega in ruralnega okolja ter številne interese v ruralnem prostoru, ki jih je treba usklajevati s potrebami zemljišč za zagotavljanje prehranske varnosti in ustreznega bivalnega okolja. Kakovostni prostorski podatki in informacije, vključno z infrastrukturo za geodetsko izmero na eni strani in naprednim sistemom zemljiške oziroma nepremičninske administracije na drugi strani, so ključnega pomena za smotrni prostorski razvoj. Upravljanje grajenega okolja zahteva nove pristope geodetske izmere, modeliranja podatkov in razvoj naprednih geoinformacijskih storitev v 3D- in 4D-digitalnem okolju. Z grajenim in naravnim okoljem so povezani izzivi za zagotavljanje varnosti prek sistemov za pravočasno zaznavanje premikov ali deformacij, pri čemer se zahtevajo natančna geodetska opazovanja z visoko prostorsko in časovno ločljivostjo. Tudi upravljanje tveganj ter ukrepanje pri naravnih nesrečah zahtevata sistematično spremljanje prostora na globalni in lokalni ravni ter sodobne lokacijske storitve.

Pri tehnoloških silnicah, ki že danes vplivajo na razvoj geodetske stroke, izpostavljam avtomatizacijo geodetskih opazovanj, sisteme za množičen zajem prostorskih podatkov z raznolikimi senzorji ter razvoj informacijske in komunikacijske tehnologije s 5G-omrežji. Pametna mesta in vasi, razvoj gradbeništva

<sup>1</sup> *Key Global and Technology Drivers Impacting Surveying. Reflection by the FIG Commissions Chairs. GIM International 1, 2021: <https://www.gim-international.com/content/article/key-global-and-technology-drivers-impacting-surveying>.*

in prodor tehnologije BIM, avtomobilska industrija s samodejnimi vozili – vse to zahteva napredne prostorske podatkovne modele, ki temeljijo na združevanju podatkov iz različnih virov v »skoraj realnem« času. Umetna inteligenca, strojno učenje ter obdelava velikih podatkov na zmogljivih računalniških sistemih v oblaku odpirajo novo obzorje za geodetsko stroko, kjer je cilj zagotavljati ustrezne prostorske informacije in algoritme v podporo odločitvam v prostoru.

Vse večja potreba po ustreznih prostorskih informacijah in tehnološki razvoj torej ponujata izjemne priložnosti geodetski in z geodezijo povezanim strokam. Da se bomo uspešno spopadli z vsemi temi izzivi, bomo morali veliko pozornosti nameniti kakovosti in standardiziranim rešitvam, ob hkratni skrbi za izobraževanje in vseživljenjsko usposabljanje kadra. Stroko torej zagotovo čakajo velike spremembe in za take strateške spremembe so potrebni ljudje, ki razmišljajo široko in napredno ter priložnosti za stroko iščejo zunaj sedanjih »okvirjev« njenega delovanja.

Takšne lastnosti je imel tudi pred kratkim preminuli *prof. Milan Naprudnik*, ki je s svojo energijo in iskričastostjo sogovornikom vedno vplival optimizem. Pred leti, ko je prebiral moje »študentske zapise« v Geodetskem vestniku, se je vljudno najavil na sestanek in ob najinem srečanju dejal »*Spoštovana mlada kolegica! V veselje mi je, da sva se spoznala. Moral sem vas srečati. Želim vam osebno povedati, da z veseljem berem vaše zapise. Nadaljujte, prosim, z vašim pisanjem ...*«. Seveda se je klepet nadaljeval, v spominu pa so mi ostale predvsem te prve Milanove besede, besede gospoda, ki sem ga takrat srečala prvič in nisem niti vedela, kdo je. Težko rečem, ali je bil ta pogovor res ključen za moje nadaljnje delovanje v stroki, zagotovo pa je imel vpliv.

Bodimo torej svetlogledi, spodbujajmo drug drugega in ne skoparimo z motiviranjem svojih sodelavcev, kolegov – skupaj bomo zagotovo uspešneje tlakovali razvoj stroke. Srečno!

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*Dear Readers of Geodetski vestnik! You are holding the first issue of the journal for the year 2021; it brings interesting submissions from the wide field of surveying and geoinformation. I believe you will be able to pick more than one good read from among the academic and professional papers, including the news from the field and from societies.*

*This editorial is dedicated to the breadth of our research and professional fields. At the moment, several discussions on the future of surveying are taking place in Slovenia and globally. Thus, FIG (International Federation of Surveyors) Commission Chairs have been discussing global and technological drivers that markedly influence the surveying profession. It is clear that geospatial data, together with the entire infrastructure to obtain and use them, are becoming crucial to our society's functioning. A lack of suitable information hinders the decision-making process and makes it impossible to follow advancements measured by globally accepted development policies, such as green development, also known as the Green Deal on the level of the EU, and sustainable development.*

*When discussing global drivers that will powerfully influence the development of surveying, one should not neglect to mention the complexity of spatial development with urbanisation, the ever-increasing interdependence of urban and rural environments, and numerous interests in rural areas that should not jeopardise the need*

*for arable land, which ensures food security, and good living environments. High-quality spatial data and information, combined with surveying infrastructure on the one hand, and the contemporary system of land or real estate administration, on the other, are of key importance for sound spatial development. The management of the built environment calls for new approaches in geodetic measurement, data modelling, and the development of state-of-the-art geoinformation services in 3D and 4D digital environments. Built and natural environments also pose security challenges in systems for the timely detection of movements and deformations of natural and built features, which calls for detailed surveying with high spatial and time resolutions. Risk management and natural disaster response also call for systematic monitoring of space, globally and locally, and new location services.*

*Regarding the technological drivers that already influence the development of the surveying profession, I would like to mention autonomous surveying techniques, systems for the mass acquisition of spatial data with various sensors, and the development of information and communication technologies with 5G networks. Smart cities and villages, developments in construction and the breakthrough of BIM technology, the car industry with automated vehicles – all these features depend on advanced spatial data models that require an ‘almost real-time’ fusion of data from different sources. Artificial intelligence, machine learning, and the processing of large data in highly-potent cloud computing systems are opening up new horizons for the surveying profession, which strives to provide suitable spatial data and algorithms to support spatial decision-making processes.*

*To conclude, the ever-growing need for suitable spatial information and technological development offers exceptional opportunities for surveying and linked professions. To be able to successfully rise to all these challenges, we will have to devote much attention to quality and standardised solutions, with the need for learning and lifelong training in the workplace. So, there is no doubt that the profession is due to face significant changes, and such strategic changes call for people that can think widely and progressively, for individuals that look for opportunities for their professions outside the existing ‘boundaries’ of its field.*

*These were also the characteristics of Professor Milan Naprudnik, who has recently passed away. He was a man of great energy and drive who was always able to arouse enthusiasm in others. Many years ago, when he came across my ‘student pieces of writing’ for Geodetski vestnik, I received a gentlemanly announcement that someone would like to meet me. Later, when we actually met, he began: ‘Dear young colleague! It is a really great pleasure to meet you. We simply had to be introduced. I wanted to tell you personally that I always enjoy reading everything from you. I just wanted to ask you to please continue to write...’ Obviously, the conversation continued, but I will never forget Milan’s first words, the words of a gentleman that I met for the first time and really had no idea who he was. It is difficult to say if the conversation had been decisive for my future professional work, but one cannot deny that it left its mark.*

*So, let us look brightly into the future, stimulate one another, and never fail to motivate our co-workers – together, we will undoubtedly be better able to pave the way for the development of the profession. Best of luck!*