

## Tomaz Podobnikar – Curriculum Vitae

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Links: [LinkedIn](#), [ResearchGate](#), [ACADEMIA](#), ([Portfolio](#), [SCGIS](#), [Geospace](#)), [Full CV](#), [Hybrid CV](#), [2p CV](#)

Publications: [Google Scholar](#), [Semantic Scholar](#), [ORCID](#), [ScopusID](#), [ResearcherID](#), [SICRIS](#), [COBISS](#)

*I am fascinated by innovation and science. Understanding the natural and social phenomena in (geo-)space over time is paramount before discovering feasible technical solutions. Taking into account a very broad perspective, I discovered that art and science make excellent bedfellows.*

### Career:

- 25+ years professional experiences
- worked for 13 academic, governmental, NGO, IGO, and consulting organizations in 9 countries
- 22 awards and 2 prizes as researcher, 3 awards as teacher
- supervised 17 BSc, 1 MSc, 5 PhD, 8 other/international students

### Professional activities:

- a proficient, self-motivated researcher (1450+ citations, reviewed 210+ papers, editorial board of 7 journals), officer, R&D, teacher (lecturer, supervisor), trainer, consultant, communicator
- managed 30+ & contributed to 90+ international projects (at least 18 with industry)
- evaluated 75+ scientific and industrial international projects and programmes
- team leader (Head of the dept., Chief GIS) and player; cross-disciplinary and multicultural involvements

### Keywords, key skills and specialization:

- **Applied Sciences (natural, social, environmental, engineering), Geosciences, Geoinformatics, Geomatics, GIScience, GIS, Earth Observation Information Science, Geodesign**
- spatial analytics, geospatial data science, geostatistics, spatial statistics, SDI, spatio-temporal, algorithm design, database design, remote sensing, geomorphometry, cartography, image processing, geovisual analytics, GeoAI, machine learning, network analysis, location-based services, application development
- environmental geography, hazard and risk management, spatial modelling for conservation (environment, cultural heritage), climate change issues, landscape archaeology, palaeoenvironmental analysis, space research
- spatial reasoning, cognition and decision making, participatory concepts, multi-source spatial data integration, combined geostatistical and geovisual spatial data and information quality/uncertainty assurance, spatial generalization, interoperability, spatial database management, semantic modelling
- geodetic (and GNSS) surveying and mapping, computer programming with coding, cloud GIS, VM
- management, governance

**Core competencies:** • proactive management/leadership since 2000, • highly organized self-starter, • comfortable in communicating at all levels, • having well-rounded experience, • seeing a research potential where other may not, • always make feasible own risky ideas, • enthusiastic teacher, • effective in team approaches to performing at their best

### Key achievements:

- **Multi-source spatial data conflation** (merging with enrichment) – a novel methodology and computer application for digital elevation model (DEM) production with integration. I have built everything from front-end to back-end and everything in between. The derived landform map has been used nationwide in all high schools and integrated into the European model (EuroDEM – EuroGeographics) and Google Earth model. The **reduced cost** of the final product **up to 25-times**, realized for the [National DEM of Slovenia](#) (from 32 data sources!) and Central Dalmatia. This methodology is one of the future trends in geospatial technology.
- **Multidirectional Visibility Index (MVI)** – a generic and multimodal based on a novel geomorphometric technique. I developed the MVI for analytical hill shading and adapted it for predictive modelling (alluvial fans/talus cones), feature recognition and description (mountain highs, karst depressions), geovisualization (visual quality control) and photography (imagery enhancement with image processing). The solution for the geomorphological highs determination was used in the Esri World Topographic Map.

**Current position:** • Sustainable Development Officer (GIS)

**Education, habilitations:** PhD, Associate Professor (2 universities), Scientific Councillor

**Courses/teaching:** • Geographic Information Systems, • Environmental Information Systems and GIS, • Management of spatial data quality, • Quality of Information, • Digital terrain modelling for natural hazards assessment, • Photogrammetry

**Biography:** Personalities : Great Slovenian Biographical Lexicon; Podobnikar, Tomaž (Osebnosti : veliki slovenski biografski leksikon), Ljubljana, Mladinska knjiga, 2008.

**Language skills:** Slovenian (mother tongue); English, Serbian and Croatian (fluent); German, Italian, Spanish, Russian, French, Arabic (basic)

### **Current position**

2021-09-06—present; **Sustainable Development Officer (GIS)**, Regional Advisor, P3; United Nations, ESCWA, Beirut, Lebanon (*IGO*)

### **Previous positions**

2008—present; Associate Professor; Faculty of Information Studies in Novo Mesto, Slovenia (*Academic: Higher Education, on demand*)

2020-09-01—present; Freelancer and Associate Professor; University of Ljubljana, University of Alaska Fairbanks (*Academic: Research & Higher Education, on demand*)

2019-05-19—2020-08-31; **Chief GIS**; United Nations; 2020-01-20—2020-08-31 (Geospatial Information Officer, P3), MINUSMA. GIS Unit, Field Technology Section (FTS), Bamako, Mali; 2019-05-19—2020-01-19 (Geospatial Information Officer, FS6), Solutions and Support Unit, Client Solutions Delivery Section Service for Geospatial, Information and Telecommunications Technologies, United Nations Global Service Centre, United Nations Department of Operational Support, Brindisi, Italy (*IGO*)

2009-11-01—2019-06-30; **Associate Professor**; Faculty of Civil and Geodetic Engineering, University of Ljubljana, Slovenia; 2014—2019, Chair of Hydrology and Hydraulic Engineering, Department of Environmental Civil Engineering; Research Institute of Geoenvironmental and Hydrological Threats – RIGHT; 2009—2014, Department of Geodetic Engineering (*Academic: Research & Higher Education*) – obtained international research projects, developed spatial models in geomorphometry, geostatistics, AI, georadar, etc.; teaching, supervising students at different levels

2013—2018; External Consultant; Oxford Policy Management Ltd, UK (*Consulting, on demand*)

2008—2013; Assistant Professor; School of Advanced Social Studies in Nova Gorica, Slovenia (*Academic: Higher Education, on demand*)

1995-11-09—2013-06-11, **Scientific Councillor** (Research Advisor); Institute of Anthropological and Spatial Studies, Scientific Research Centre of the Slovenian Academy of Sciences and Arts, Slovenia, research leaders: Zoran Stančič, Tomaž Podobnikar (2008—2013, Head of the Department of Environmental Studies) (*Academic: Research*)

2012-10-01—2013-09-30; Project Manager and Consultant; Mura Regional Development Agency Ltd, Slovenia (*NGO, part-time*)

2008-10-01—2011-08-31; Assistant Professor; School of Environmental Sciences, University of Nova Gorica, Slovenia, research leader: Tomaž Podobnikar (*Academic: Research & Higher Education, part-time*)

2007-01-01—2008-12-31; Project Assistant; Institute of Photogrammetry and Remote Sensing, Vienna University of Technology, Austria, research leaders: Norbert Pfeifer, Josef Jansa (*Academic: Research*)

1995-08-01—1995-11-08; Civil Servant; Surveying and Mapping Authority of the RS, Ministry of Environment of the Republic of Slovenia, Ljubljana, Slovenia (*Governmental*)

### **International mobility (postdocs, research visits)**

Realized 9 research periods abroad of at least 1 month, altogether 15 months (+ employment for 30 months at Vienna University of Technology):

2019; Fulbright Visiting Scholar Program; Department of Marine Geosciences - Rosenstiel School of Marine and Atmospheric Science, University of Miami, USA; Developing Geomorphic Methods for the Automated Recognition of Reef Features – A Case Study in Monitoring Coral Reef Resilience (*Academic: Research*)

2006-09-01—2006-12-31; Quality Researcher; C.N.R.S., Laboratoire de Chrono-écologie, Université de Franche-Comté, Besançon, France (*Academic: Research*)

2004-05-12—2004-06-25 and 2005-04-20—2005-06-07; Research Expeditions; National Geographic Society (CRE grant); South Campeche, Reserva de la Biósfera de Calakmul, Yucatán and Mexico City, Mexico (*Academic: Research*)

1999-05-10—1999-06-10, 2000-03-27—2000-04-30 and 2001-04-18—2001-04-22; Visiting Researcher; Institute of Photogrammetry and Remote Sensing, Vienna University of Technology, Austria, research leader: Karl Kraus (*Academic: Research*)

1997-01-01—1997-05-01; Visiting Researcher; Faculty of Geodesy, Delft University of Technology, The Netherlands, research leaders: Theo Tijssen, Mathias Lemmens, Theo Bogaerts (*Academic: Research*)

1994-07-01—1994-08-31; Research Expedition; Island of Brač, Croatia, research leader: Zoran Stančič  
(*Academic: Research*)

#### *Other previous positions*

2017-09-04—2017-10-11; Associate Geospatial Information Officer; Global Service Centre, Brindisi, Italy  
(*United Nations* – selected for the position)

1986-09-17—1987-09-11; Pioneer (guard engineering); Compulsory one-year military service, Belgrade

#### *Countries of work experience*

Albania, Austria, Croatia, France, Germany, Italy, Lebanon, Mali, North Macedonia, Mexico, the Netherlands, Serbia, Slovenia

#### *Education*

2001-09-28 (1998—2001); **PhD** – Doctor of Science: [Digital terrain model from various data sources of different quality](#) (cited 26 times) (*geospatial, GIS, geoinformatics, geomorphometry, geovisual analytics, spatial analysis, cartography, multi-source data conflation [integration/fusion/merging], semantic enrichment, photogrammetry, remote sensing, physical and regional geography*), Faculty of Civil and Geodetic Engineering, **University of Ljubljana** (UL FGG), supervisors: Zoran Stančič and Karl Kraus (**Vienna University of Technology**)

1998-05-15 (1995—1998); MSc in Geodesy: Monte Carlo simulation methods in spatial analysis (*geospatial analysis, GIS, Monte Carlo methods, geoinformatics, geovisualization, cartography, geostatistics, regional geography*), UL FGG, supervisor: Zoran Stančič

1995-07-06 (1991—1995); BSc – Bachelor of Geodetic Engineering: Spatial modelling with geographic information system (*geospatial analysis, GIS, landscape archaeology, environmental geography, coordinate systems, modelling, geodesy*), Faculty of Architecture, Civil Engineering and Geodesy, University of Ljubljana, supervisor: Zoran Stančič

1987—1990; BSc: Faculty of Mathematics and Physics, University of Ljubljana (*meteorology, technical physics*)

1986-06-24 (1982—1986): Structural Technician; Secondary School of Civil Engineering, Ljubljana

#### *Institutional responsibilities, leadership*

Leadership skills realised in the following positions:

2020; **GIS Chief**, MINUSMA. GIS Unit, Field Technology Section (FTS), United Nations, Bamako, Mali (IGO)

2011—2015; Co-founder of Vedomec, Institute for the Spatial Culture, Slovenia (*NGO*; on my initiative)

2007—2013; **Scientific Councillor** (Research Advisor) and **Head of the Department of Environmental Studies** of the Institute of Anthropological and Spatial Studies (established on my initiative), Scientific Research Centre of the Slovenian Academy of Sciences and Arts, Slovenia

2004—2008; **Member of the Science Council** of the Institute of Anthropological and Spatial Studies, Scientific Research Centre of the Slovenian Academy of Sciences and Arts, Slovenia

Active participation in **12 training on leadership** and ethics since 2007.

#### *Habilitations / qualified teacher status*

2015-12-18; **Associate Professor**, Geodesy and Geoinformatics (University of Ljubljana)

2010-10-14; **Scientific Councillor** (Scientific Research Centre of the Slovenian Academy of Sciences and Arts) – permanent academic rank

2010-06-02; Assistant Professor, Cartography (University of Ljubljana)

2008-01-17; Assistant Professor, Spatial Informatics (University of Nova Gorica)

2005-09-21; Senior Scientific Associate (Scientific Research Centre of the Slovenian Academy of Sciences and Arts)

2001-12-13; Scientific Associate (Scientific Research Centre of the Slovenian Academy of Sciences and Arts)

#### *Memberships of scientific associations*

Active membership of a number of working groups, councils, boards, committees, networks, scientific associations; particularly:

2020—present; The European Location Interoperability Solutions for e-Government (ELISE)

2018—present; European AI Alliance

2015—present; Society for Conservation GIS (SCGIS)  
 2012—present; Slovenian Association of Geodesy and Geophysics (IUGG)  
 2010—present; Geomorphological Society of Slovenia  
 2009—present; Section for Cartography at the Association of Surveyors of Slovenia  
 2009—present; ICA Commission on Cartography in Early Warning and Crises Management  
 2009—present; ICA Commission on Generalisation and Multiple Representation  
 2007—present; ICA Commission on Mountain Cartography  
 2007—present; European Geosciences Union (EGU)  
 2007—2010; International Association of Hydrology Sciences (IAHS)  
 1998—2012; Association Geographic Information Laboratoires Europe (AGILE)

### **Research activities**

Worked on different types of projects and focused my research activities on other complementary topics in spatial analysis, but especially those related to GIS, remote sensing, or DEM.

#### *Areas of interest (alphabetically)*

Domains: **Geoinformatics, Geomatics, GIScience, Earth Observation Information Science, Engineering, Environmental and Social Sciences**; analytical shading; cartography [computational, historical]; cognition; crowdsourcing; decision-making and GIS; digital elevation/terrain models (DEMs/DTMs); Earth observation; extract, transform, load (ETL); feature detection and recognition; flipped learning; generalization; generic methods development; geodesign; geographic information system (GIS); geographic object-based image analysis (GEOBIA); geography [environmental, physical, regional, cognitive]; geodesy; geomorphology and geophysics; geomorphometry and digital terrain analysis; geoprocessing; geostatistics; geovisual analytics; geovisualization; ground-penetrating radar (GPR); hazard and risk management; heuristic methods; image processing; interpolation methods and sampling; lidar (ALS) analysis; multimethod research, participatory/collaborative methods; remote sensing; semantic enrichment; spatio-temporal analysis; spatial [databases development and management, modelling and reasoning, statistics, thinking concepts]; spatial data [conflation/integration/fusion/merging, mining, quality/information/uncertainty analysis and management, warehouse]; standardization and interoperability

#### *External research funding history*

Very successful in obtaining research grants at national, regional, EU and other international levels. Since 1990 actively involved, as a major team player, in more than **90+ national and international collaborative research projects**, also in cooperation with the **policy**, in Slovenia, Croatia, North Macedonia, Italy, Austria, Hungary, France, Russia, Mexico, as well as in a project covering the entire Earth and the planet Mars. Worked in different types of groups and alone. This has given me access to excellent networks of people from EU countries and other parts of the world. Successfully **designed and raised competitive research funds for 20+ projects (€1.5 million)**, **managed** and implemented these projects (e.g. co-financed by the ERDF: FP6, FP7), and have been a part of **18+ joint cooperation projects with industry (R&D)**, co-financed by Skolkovo Foundation, Telekom, DARS, UN, etc. The work includes a number of basic research projects co-financed by FFG/ALR, ASAP, ARRS, etc. Highlighted projects with their acronyms: OBSERVE, PARAMount, TransEcoNet, TMIS.plus.II, TMIS.morph, CAENTI, SISTEMaPARC, Alpine Windharvest, AQUADAPT, ArchaeDyn, Adriatic Island Project, National Program of Water Management – within the framework of Interreg programs, Central Europe, Inter-American Development Bank, [National Geographic Society](#) (CRE grant), INiTS, etc. An excellent result of 88.50% for the 2012 MSCA call.

<i>Project (aggregated)</i>	<i>Result (cross-disciplinary)</i>
Computational cartography and geovisualization	Assessment of water quality in Slovenia; National program of water management; Major polluters of waters in Slovenia; National plans for gas supply; POP TV (Slovenia, Europe and Earth); mental maps (Albania)
National projection system – program codes for transformations, knowhow	National topographic maps in a new coordinate system; a framework for mobile network planning (Telekom)
Spatial database – design, implementation and management	Archaeological database of Central Dalmatia (for regional planning); Cultural and Natural Heritage Database of Slovenia
Digital elevation/terrain models (DEMs/DTMs) processing, including lidar	<a href="#">National DEM 12.5, 25 and 100 m</a> ; A DEM of Slovenia, city models for mobile network planning (Telekom), and DEM of Central Dalmatia (including bathymetry), Croatia; DEM landform visualizations for Slovenia, Europe, Earth (POP TV)

Archaeological predictive models (empirical, geostatistical) and analysis (ancient paths, visualsapes, catchment)	For planning road construction (DARS), anthropological reconnaissance and prospection (Croatia, Slovenia, France, Mexico), understanding social and natural environment
Predictive modelling in natural and cultural environments (including geomorphometric factors)	Models of fans on the planet Mars (Mars Express); wet meadows; invasive species ( <i>Robinia pseudoacacia</i> , <i>Fallopia japonica</i> ); national soil information system; sea level rise
Degradation of landscapes and hazard management – spatial analysis	Anthropogenic impact on karst geomorphology; fans and debris flow detection for prediction (Alps: Slovenia, Austria)
Methodology and platform of dynamical toll collection factors	Proposal of a spatial model for toll collection in Slovenia (Eurovignette) and a prototype spatial model
Spatial datasets and simulations for film (“Nature and the City”) – spatial analysis and modelling	GIS-layers as a result of automated palaeo relief modelling and historical maps applications used as a basis for ancient landscape reconstruction (City Museum of Ljubljana)
Wind conditions and solar radiation energy modelling	Assess suitable locations for wind power plants and photovoltaics power stations
Dialects/languages modelling and formalizing	Slovenian Linguistic Atlas – maps, processed with spatial analysis and geomorphometry principles
Quality management – qualitative & quantitative control and improvement	National topographic and other datasets, tasks that require high quality datasets
Web GIS, geostatistical servers, dashboards – architecture and implementation	<a href="#">Web GIS server</a> platform for national Cultural and Natural Heritage Database, Archaeological Cadastre of Slovenia ( <a href="#">ARKAS</a> ), <a href="#">Maya heritage in Yucatán</a> , Mexico
Three interconnected projects <a href="#">Unite GeoPortal</a> , Unite Aware, and Unite Maps Initiative to develop web GIS applications	Designed and deployed in the UN Field Missions; standardised technologies to collect and manage data, information via visualisation, reporting and analysis, etc. to provide enhanced situation awareness

Recently involved in the following funded projects:

- 2019–2020: United Nations: »Unite Aware platform« in »Unite Maps initiative« and initiate idea of the COVID-19 spatial platform
- 2017—2020; Recognition of potentially hazardous torrential fans using geomorphometric methods and simulating fan formation (2 related projects: ARRS and International Programme on Landslides – IPL)
- 2016—2019; Water science and technology, and Geotechnics Programme [P2-0180] (ARRS), contributor (UL FGG)

#### *Fellowships and grants*

**Awarded with over 25 competitive grants**, scholarships and fellowships, with invitations to international workshops, conferences and study advancement: European Community grants; a grant from European Space Agency and Euroimage (1995); grants from the Open Society Fund – Slovenia (1995, 1996, 1997); the Mršič grant from the Scientific Research Centre of the Slovenian Academy of Sciences and Arts (1999); a grant from Gotland University College (2001); a grant from Digital Earth (2003); grants from Esri (2004) and AGILE (2009). Below is a list of selected grants/awards:

- 2015-07-10—29; a **scholarship award from the Society for Conservation GIS (SCGIS)**; to attend and present at the 18th Annual SCGIS Conference and at the 35th Annual Esri International User Conference, and to receive a GIS training at UC Davis: California, USA
- 2000-06-18—24; a **scholarship award by Center for Spatially Integrated Social Science (CSISS)**, Santa Barbara; for workshop Perspectives on Spatial Analysis in the Social Sciences; Washington University, Seattle, USA
- 1995-11-09—2001-06-30; Young Researcher; Ministry of Science and Technology, Slovenia
- 1993-01-01—1995-05-31; Intern Scholarship; Surveying and Mapping Authority of the Republic of Slovenia, Ministry of Environment, Slovenia

#### *Start-ups in the industry (successfully accepted)*

- 2021; Start-up project in the UiG 2021, SmartDEM <https://kwf.at>
- 2020; Start-up Slovenija, Future 4.0 <https://future40.si>
- 2019; START:IP, INiTS; Top Topography <https://www.inits.at>
- 2014, 2017, 2018; “Spatial data integration, Space Technologies and Telecommunications grant” (*excellent score: 34/1!*) and “Information Technologies grant” (*excellent score: 21/4*) (2 related projects), project

manager and principal investigator (Skolkovo Foundation – Russian Skolkovo Innovation Center)  
<https://old.sk.ru/foundation>

#### *Scholarly networks and accomplishments*

Glad to see that students and researchers mentored and taught have subsequently gone on to pursue academic research and some of them currently hold positions at renowned European and other research institutions. Similarly, **recruited interdisciplinary and international staff** for my own research teams, such as geoscientists, geodesists, geologists, geographers, landscape ecologists, linguists, physicists, etc., all with equal success.

Established a number of **scientific collaborations**, especially with the Vienna University of Technology, Eötvös University, Finnish Geospatial Research Institute, Dresden University of Technology, Stockholm University, University of St Andrews, UC Davis, University of Miami, etc. Actively involved in setting up research teams of considerable size at various institutions, has taken the initiative to set up databases of high-quality spatial datasets of cultural and natural heritage and has collaborated with **governments** (e.g. Slovenia, Austria, Croatia, Nepal), **industry** (e.g. Telekom, DARS, GDi, Esri, SmartIS, Terabee, Ovinto, Sinergise, Aerovision) and **NGOs** (e.g. ICARDA, ICIMOD) and others (USAID, ESA) as a member of the Scientific Council and project manager.

#### *Organization of scientific meetings (conferences, workshops)*

Organizer of a number of conferences and workshops, such as Geographical Information Systems in Slovenia, which builds networks of researchers, producers of databases and software, teachers and other users of geoinformatics.

1997—present; Geographical Information Systems in Slovenia, Slovenia, biennial symposiums, steering/organising committee, ~150 participants (across academia, industry, government)  
2009-06-24—26; 27th Urban Data Management Symposium, Ljubljana, Slovenia, local organising committee  
2009-04-24—25; HRSC Team Meeting (for Mars Express project), Vienna University of Technology, Vienna, Austria, local co-organizer  
2007-07-01—07; ISPRS WG VI/5 & SC Summer School “Theory and Application of Laser Scanning”. Ljubljana, Slovenia, local organizer support  
2000-02-02—05; ISPRS WG VI/3 and WG IV/3 joint meeting Bridging the Gap, Ljubljana, Slovenia, local organising committee

#### *Scientific committee member, reviewer, evaluator, editorial experiences (commissions of trust)*

<i>Journal Reviewer</i>	<i>Publisher</i>
Int J Geogr Inf Sci, J Spat Sci, Int J Digit Earth, Int J Remote Sens, Cartogr J, Mar Geod, Remote Sens Lett	Taylor & Frances
Acta geod. geophys., J. Mt. Sci.-Engl., LNGC (Cartography in Central and Eastern Europe), Int. J. Phys. Sci., Earth Sci. Inform., SN Applied Sciences, Arab. J. Geosci.	Springer
Appl Geogr, ISPRS J Photogramm, Comput Geosci, Acta Astronaut	Elsevier
Trans GIS	John Wiley & Sons
Open Geosci	De Gruyter
Remote Sens, Entropy, ISPRS Int J Geoinf, Sensors, J Mar Sci Eng, (BDCC), Water, Symmetry	MDPI
Prog Phys Geogr	Sage
Int J Wildland Fire	CSIRO Publishing
Geogr Pannon, Acta Carsologica, Journal of Civil Engineering and Architecture, Hydrol Earth Syst Sc, Geod list, Geod vestn (Journal of Geodesy), Gradbeni vestnik (Journal of Civil Engineering), Arheo Journal, Acta Silvae et Ligni, Austrian Journal of Earth Sciences	other

Formally a **member of the programme/scientific committee**: ISIT, International Conference on Information Society and Information Technology, Slovenia; Varstvo narave (Nature Protection), Slovenia (in Slovenian); Savremene tendencije u turizmu '99, (in Serbian). Novi Sad, Yugoslavia (now Serbia); 1<sup>st</sup> ICA Symposium on Cartography for Central and Eastern Europe 2009; GeoCart'2010: 5th New Zealand Cartographic Conference / 1<sup>st</sup> ICA Symposium on Cartography for Australasia and Oceania; Spatial Analysis and GEomatics (SAGEO), France (in French and English) (6 years).

Also **editor or a member of the editorial board** of the following journals and monographs:

2021—present; [Remote Sensing](#), MDPI (ISSN 2072-4292), Topic Editor  
2019—present; [Remote Sensing](#), section “Remote Sensing in Geology, Geomorphology and Hydrology”, MDPI (ISSN 2072-4292), Editorial Board (Section Editor)  
2016—present; [Geoinformatics FCE CTU](#) (ISSN: 1802-2669), Editorial Board  
2015—present; [International Journal of Earth and Environmental Sciences](#) (ISSN: 2456-351X), Editorial Board  
2013—2016; [ISPRS Journal of Photogrammetry and Remote Sensing](#), Elsevier (ISSN: 0924-2716), Editorial Board  
2010—2014; [Geodetski vestnik / Journal of Geodesy](#) (ISSN 0351-0271), Editorial Board  
1997—present; [Geographical Information Systems in Slovenia](#) (monographic series, ISSN: 1855-4954), Editor/Editorial Board

In addition, **edited monographs** and **special issues**:

**Podobnikar, T.**, 2022: Spatio-Temporal Analysis of Urbanization Using GIS and Remote Sensing, *Remote Sens.*, Special Issue, [https://www.mdpi.com/journal/remotesensing/special\\_issues/0A11OY66O6](https://www.mdpi.com/journal/remotesensing/special_issues/0A11OY66O6)

**Podobnikar, T.**, 2021: Perspectives on Digital Elevation Model Applications, *Remote Sens.*, Special Issue, [https://www.mdpi.com/journal/remotesensing/special\\_issues/dem\\_perspectives#editors](https://www.mdpi.com/journal/remotesensing/special_issues/dem_perspectives#editors)

**Podobnikar, T.**, Oksanen, J. 2020: Advances in Global Digital Elevation Model Processing, *Remote Sens.*, Special Issue, <http://www.mdpi.com/si/27711#editors>

**Podobnikar, T.**, Čeh, M. 2012: Universal Ontology of Geographic Space: Semantic Enrichment for Spatial Data, *IGI Global*, XXVII, 276 p. DOI: [10.4018/978-1-4666-0327-1](https://doi.org/10.4018/978-1-4666-0327-1) (cited 11 times)

**Podobnikar, T.** et al. 1998, 2000, 2002, 2004, 2006: [Geographical Information Systems in Slovenia](#), *ZRC Publishing*, (5 monographs)

Edited and wrote Standard Operating Procedures (SOP-s) and other manuals during United Nation appointments.

Appointed for **assessments for** a number of **academic posts**, as Scientific Councillor at Slovenian Academy of Sciences and Arts and internationally.

#### *Expert tasks*

Having referred 2 monographs and have also been an evaluator and a referee (wrote **experts' reports**) of 55+ national and 20+ international programmes and projects (basic research, applied science and industry – R&D) since 2003 (Slovenia, Czech Republic, Belgium, Bulgaria, Croatia, France, Montenegro, Netherlands). Additionally, registered and active external **expert (evaluator)** or **board member** of:

2021—2025; Malta Council for Science and Technology (MCST)

2019, 2021; Fulbright: Fulbright Senior Award

2018—present; IBF International Consulting

2018—present; Montenegrin Ministry of Science

2018—present; COST (European Cooperation in Science & Technology)

2017—2018; Marie Skłodowska-Curie Individual Fellowships (MSCA-IF) 2017 call

2017—present; Ministry of Economic Development and Technology, Slovenia (EUREKA, DEMO PILOTI, RRI2)

2017—present; SPIRIT Slovenia (Public Agency for Entrepreneurship, Internationalization, Foreign Investments and Technology)

2017—present; Ministry of Science and Education, Croatia

2016—2020; CMEPIUS

2016—present; REGIO (to support Cohesion Policy, regional and urban development) of the European Commission

2014—present; Horizon 2020 Advisory Groups (European Commission)

2003—2008; Slovenian Research Agency (ARRS)

Appointed as an independent government consultant for the high-resolution lidar terrain models:

2010—2011; Member, Working group for preparation of the starting points for acquisition of terrain data with lidar (Ministry of the Environment and Spatial Planning of the Republic of Slovenia)

#### *Fieldwork and research expeditions*

Having contributed to several fieldwork projects my own scientific outputs were improved during the process. The main areas of fieldwork are **ecological, archaeological, anthropological and geomorphological mapping, geodetic survey**, including various **land cadastre, GNSS and lidar measurements**, and other **survey and geospatial data**. The archaeological fieldworks (1994–2005) lasted between one and eight weeks and included geodetic measurements, online mapping using innovative GIS-

based quality control, design and creation of databases, archaeological prospection, etc., all of which served as a basis for further spatial analysis. Also, participated in fieldwork (archaeological reconnaissance, anthropological survey, geodetic surveying and advanced mapping, ecological and speleological investigations, etc.): in particular on the island Brač, in Makarska, and Cetina Valley in Croatia (1994 and 1999); at Tonovcov grad in Slovenia (1996); and in South Campeche, Yucatán, Mexico (2004 and 2005). Other experiences with fieldwork included GNSS (GPS) campaigns in Slovenia and (North) Macedonia (1994–1998), which usually lasted 10 days: EUREF'94, Slovenia'95, EUREF MAK'96 to name a few. The other types of fieldworks included the measurement of trees position for lidar data calibration and making detailed relief measurements for lidar data control (2004), anthropological surveys in Albania (2007), mapping of invasive plants in Slovenia (*Fallopia japonica* and *Robinia pseudacacia*) (2009–2011), geomorphological survey (2014), and fieldwork for stabilization purposes in Mali (United Nations, 2020).

### Publications

Active Contribution	No.
Peer-reviewed original scientific papers for journals / Commentary articles / Monographs	55 / 2 / 27
Popular science articles / Invited talks & tutorials / Interviewee	54 / 52 / 17
International / National conferences & meetings with oral or poster presentation & papers	60 / 7
Editor / Reviewer of international journals / Reviewed papers	7 / 49 / 210
Citation (Google Scholar / <a href="#">Scopus</a> )	<a href="#">1421</a> / <a href="#">563</a>
H-index (Google Scholar / Scopus)	<a href="#">17</a> / <a href="#">11</a>

A complete list of publications (615 records) is documented in COBISS (Bibliographic System of Slovenia), [Personal Bibliographies](#) with WoS. The most visible paper was cited 112-times (Google Scholar). Published in the following selected internationally recognized journals and books: Int. J. Geogr. Inf. Sci., Trans. GIS, Int. J. Appl. Earth Obs., Cartogr. J., Planet. Space Sci., Remote Sens., Int. J. Remote Sens., Acta Geod. Geophys., Comput. Geosci., Environ. Geol., Int. Arch. Photogramm., Int. J. Wildland Fire, Biol. Conserv., (books in IGI Global, BAR International Series, Archaeopress, Springer).

Led or worked in some very interesting groups, or did research independently, under different conditions, which is reflected in publications by one or more authors. An example of representative publications (all references available upon request):

- Šarlah, N., **Podobnikar, T.**, Ambrožič, T., Mušič, B. 2020: Application of Kinematic GPR-TPS Model with High 3D Georeference Accuracy for Underground Utility Infrastructure Mapping: A Case Study from Urban Sites in Celje, Slovenia. *Remote Sens*, 12(8). DOI: [10.3390/rs12081228](#) (cited 2 times)
- Šarlah, N., **Podobnikar, T.**, Mongus, D., Ambrožič, T., Mušič, B. 2019: Kinematic GPR-TPS Model for Infrastructure Asset Identification with High 3D Georeference Accuracy Developed in a Real Urban Test Field. *Remote Sens*, 11(12). DOI: [10.3390/rs11121457](#) (highly accessed article in July and August 2019) (cited 4 times)
- Podobnikar, T.**, Štefančič, M., Verbovšek, T. 2019: [A](#) GIS-based approach to karst relief cyclicity by using Fast Fourier transform. *AGILE 2019 – Limassol, June 17-20, 2019*, 5 p.
- Podobnikar, T.** 2018: Palaeotopography concerning sea level changes to rethink past human activities in Central Dalmatian islands, Adriatic Sea. *Acta hydrotechnica*, 31(55), 143-156. DOI: [10.15292/acta.hydro.2018.09](#)
- Šturm, T., **Podobnikar, T.** 2017: A probability model for long term forest fire occurrence in the karst forest management area of Slovenia. *Int J Wildland Fire*, 26(5), 399-412. DOI: [10.1071/WF15192](#) (cited 9 times)
- Podobnikar, T.**, Székely, B. 2015: Towards the automated geomorphometric extraction of talus slopes in Martian landscapes. *Planet Space Sci*, 105, 148-158. DOI: [10.1016/j.pss.2014.11.019](#) (cited 6 times)
- Podobnikar, T.** 2012: Detecting Mountain Peaks and Delineating Their Shapes Using Digital Elevation Models, Remote Sensing and Geographic Information Systems Using Autometric Methodological Procedures. *Remote Sens*, 4(3), 784-809. DOI: [10.3390/rs4030784](#) (cited 44 times)
- Podobnikar, T.** 2012: Multidirectional Visibility Index for Analytical Shading Enhancement. *Cartogr J*, 49(3), 195-207. DOI: [10.1179/1743277412Y.0000000012](#) (cited 13 times)
- Podobnikar, T.**, Vrečko, A. 2012: Digital Elevation Model from the Best Results of Different Filtering of a Lidar Point Cloud. *Trans GIS*, 16(5), 603-617. DOI: [10.1111/j.1467-9671.2012.01335.x](#) (cited 37 times)
- Dorigo, W., Lucieer, A., **Podobnikar, T.**, Čarni, A. 2012: Mapping invasive *Fallopia japonica* by combined spectral, spatial, and temporal analysis of digital orthophotos. *Int J Appl Earth Obs*, 19, 185-195. DOI: [10.1016/j.jag.2012.05.004](#) (cited 86 times)
- Podobnikar, T.** 2009: Methods for visual quality assessment of a digital terrain model. *S.A.P.I.EN.S.*, special Issue 2(2), [15-24](#) (cited 97 times)



- Podobnikar, T.** 2009: Georeferencing and quality assessment of Josephine survey maps for the mountainous region in the Triglav National Park. *Acta geod geophys Hung*, 44(1), 49-66. DOI: [10.1556/AGeod.44.2009.1.6](https://doi.org/10.1556/AGeod.44.2009.1.6) (cited 57 times)
- Podobnikar, T.,** Ščoner, M., Jansa, J., Pfeifer, N. 2009: Spatial analysis of anthropogenic impact on karst geomorphology (Slovenia). *Environ geol*, 58(2), 257-268. DOI: [10.1007/s00254-008-1607-3](https://doi.org/10.1007/s00254-008-1607-3) (cited 24 times)
- Podobnikar, T.** 2005: Production of integrated digital terrain model from multiple datasets of different quality. *Int J Geogr Inf Sci*, 19(1), 69-89. DOI: [10.1080/13658810412331280130](https://doi.org/10.1080/13658810412331280130) (cited 82 times)
- Other representative publications:
- Podobnikar, T.** 2017: Semantic generalization of the multi-source digital elevation model (DEM). *ICC 2017*, 9p.
- Podobnikar, T.** 2016: Combination of error characterization and spatial error model to improve quality of digital elevation models. Proceedings of *Spatial Accuracy 2016*, 241-248.
- Podobnikar, T.** 2016: Relevant Quality of Digital Elevation Models in Earth and Environmental Studies? *Int J Earth Environ Sci* 1-106. DOI: [10.15344/2456-351X/2016/106](https://doi.org/10.15344/2456-351X/2016/106) (cited 1 times)
- Bec, D., **Podobnikar, T.** 2015: Collaborative and individual approach in the flipped learning by assessing students on the basis of spatial data quality control. *Dela*, 44, 103-133. DOI: [10.4312/dela.44.1.103-133](https://doi.org/10.4312/dela.44.1.103-133)
- Obu, J., **Podobnikar, T.** 2013: Algorithm for karst depression recognition using digital terrain models. *Geod vestn*, 57(2), 260-270. DOI: [10.15292/geodetski-vestnik.2013.02.260-270](https://doi.org/10.15292/geodetski-vestnik.2013.02.260-270) (cited 30 times; my highly cited article in Slovenian language)
- Sodnik, J., **Podobnikar, T.,** Petje, U., Mikoš, M. 2013: Topographic data and numerical debris-flow modeling. *Landslide Science and Practice*. 1, 573-578. DOI: [10.1007/978-3-642-31325-7\\_75](https://doi.org/10.1007/978-3-642-31325-7_75) (cited 9 times)
- Podobnikar, T.,** Čeh, M. (eds.) 2012: Universal Ontology of Geographic Space: Semantic Enrichment for Spatial Data, *IGI Global*, 276p. DOI: [10.4018/978-1-4666-0327-1](https://doi.org/10.4018/978-1-4666-0327-1) (cited 10 times)
- Somodi, I., Čarni, A., Ribeiro, D., **Podobnikar, T.** 2012: Recognition of the invasive species *Robinia pseudacacia* from combined remote sensing and GIS sources. *Biol Conserv*, 150(1), 59-67. DOI: [10.1016/j.biocon.2012.02.014](https://doi.org/10.1016/j.biocon.2012.02.014) (cited 51 times)
- Smole, D., Čeh, M., **Podobnikar, T.** 2011: Evaluation of Inductive Logic Programming for Information Extraction from Natural Language Texts to Support Spatial Data Recommendation Services. *Int J Geogr Inf Sci* 25(11), 1809-1827. DOI: [10.1080/13658816.2011.556640](https://doi.org/10.1080/13658816.2011.556640) (cited 13 times)
- Podobnikar, T.,** Škofic, J., Horvat, M. 2010: Mapping and analysing the local language areas for Slovenian linguistic atlas. In: Gartner, G.F., Ortig, F. (eds.). Cartography in Central and Eastern Europe: selected papers of the 1st ICA Symposium on cartography for Central and Eastern Europe, *Lecture notes in geoinformation and cartography*, Springer, 361-382. DOI: [10.1007/978-3-642-03294-3\\_23](https://doi.org/10.1007/978-3-642-03294-3_23) (cited 1 times)
- Podobnikar, T.** 2008: Simulation and representation of the positional errors of boundary and interior regions in maps. In: Geospatial vision: New dimensions in cartography; selected papers from the 4th National Cartographic Conference Geocart'2008, New Zealand, *Lecture notes in geoinformation and cartography*, Springer, 141-169. DOI: [10.1007/978-3-540-70970-1](https://doi.org/10.1007/978-3-540-70970-1) (cited 12 times)
- Podobnikar, T.,** Oštir, K. 2008: Geographical information systems and remote sensing analysis. In: Šprajc, I. (ed.). Reconocimiento arqueológico en el sureste del estado de Campeche, México: 1996-2005, (BAR international series, Paris monographs in American archaeology, 1742, 19). Oxford: Archaeopress, 243-261. (cited 4 times)
- Zakšek, K., Fovet, E., Nuninger, L., **Podobnikar, T.** 2008: Path modelling and settlement pattern. In: Posluschny, A. (ed.). Layers of perception: proceedings of the 35th International Conference on Computer Applications and Quantitative methods in Archaeology (CAA), Berlin, Germany, April 2-6, 2007, *Kolloquien zur Vor- und Frühgeschichte, Bd. 10*, 309-315. DOI: [10.15496/publikation-3609](https://doi.org/10.15496/publikation-3609) (cited 29 times)
- Podobnikar, T.,** Oštir, K., Zakšek, K. 2006: Influence of data quality on solar radiation modeling. In: Campagna, M. (ed.). GIS for sustainable development. CRC Press, Taylor & Francis, 417-430. DOI: [10.1201/9781420037845.ch24](https://doi.org/10.1201/9781420037845.ch24) (cited 2 times)
- Zakšek, K., **Podobnikar, T.,** Oštir, K. 2005: Solar radiation modelling. *Comput geosci*, 31, 233-240. DOI: [10.1016/j.cageo.2004.09.018](https://doi.org/10.1016/j.cageo.2004.09.018) (cited 57 times)
- Oštir, K., Veljanovski, T., **Podobnikar, T.,** Stančič, Z. 2003: Application of satellite remote sensing in natural hazard management: The Mount Mangart landslide case study. *Int. J. Remote Sens.*, 24(20), 3983-4002. DOI: [10.1080/0143116031000103826](https://doi.org/10.1080/0143116031000103826) (cited 90 times) (based on the first activation of the [Space and Major Disasters' Charter](#), in 2000)
- Podobnikar, T.** 1999: Monte Carlo simulations in Slovenia: Modelling and visualization of spatial data error. *GIM International*, 13(7), 47-49. (cited 7 times)

Gaffney, V.L., Oštir, K., **Podobnikar, T.**, Stančič, Z. 1996: [Spatial analyses, field surveys, territories and mental maps on the Island of Brač](#). *Archeologia e calcolatori*, 7, 27-41. (cited 11 times)

#### *Management and interpersonal skills education*

2022; 'ESCWA Agile Introduction Training' certificate by ESCWA

2020; Business Relationship Management Professional (BRMP®) certificate by APMG International (2019; PRINCE2® Foundation certificate)

2017; active participation at the specialization workshop: "Workshop on the use of patent information" (3h), by University of Ljubljana

2016; active participation at the specialization workshop: "Successful Public Speaking in English" (15h), by University of Ljubljana

2015; active participation at the specialization workshop: "Appreciative Inquiry" (8h), by University of Ljubljana

2014; active participation at the 2 specialization workshop: "Management of business processes at educational institutions" (4h); "Creating a working and learning environment for the future" (16h), both by University of Ljubljana

2014; "Open doors day on quality", by Slovenian Institute for Standardization - SIST

2010; active participation at the specialization workshop: "Basis for the preparation and control of the project" (8h), by Association of Civil Society Organizations

#### *Honours*

2014-11; Certificate of Outstanding Contribution in Reviewing of the ISPRS Journal of Photogrammetry and Remote Sensing

2004-05; First prize for the poster; Čeh, M., Smole, D., Podobnikar, T. Geodata – Are they Accessible and Useful?; 7th AGILE Conference on Geographic Information Science, Heraklion, Greece. The prize encouraged our team to pursue research on the topic of the universal ontology of geographic space. Proud to be asked to edit a monograph on the topic, which was published in 2012, as well as a special issue, published in 2020.

#### *Teaching experience and history*

Solid higher education teaching expertise in geoinformatics, geomatics, and GIScience. Allowed to develop and deliver innovative and effective teaching lectures and curricula (courses), and learning materials, I attracted students and colleagues from different disciplines to involve GI in the curricula of new disciplines. My well-designed and delivered lectures, tutorials and lab work enabled me to offer courses that are more dynamic:

2010—present; University of Ljubljana, for doctoral study 'Built Environment': Associate Professor – (1) **Digital terrain modelling for natural hazards assessment** (individual lectures; developed this course; mainly for civil engineers), (2) **Management of spatial data quality** (individual lectures; developed this course; mainly for geodesists)

2008—present; Faculty of Information Studies in Novo Mesto, and the same program for School of Advanced Social Studies in Nova Gorica, for postgraduate students: Associate Professor – (1) **Quality of Information** (lectures, tutorials, lab work; or individual work; 75h; developed this course), (2) **Geographic Information Systems** (lectures, tutorials, lab work; or individual work; 75h; developed this course)

2010, 2011; University of Ljubljana, Faculty of Civil and Geodetic Engineering, for undergraduate students: Assistant Professor – **Photogrammetry II** (tutorials for undergraduate students; 30h)

2008—2011; University of Nova Gorica, School of Environmental Sciences: Assistant Professor – (1) **Environmental Information Systems and GIS** (lectures, tutorials for undergraduate students; 45h; I developed this course), (2) **Geographic Information Systems** (lectures, tutorials for postgraduate students; 45h; developed this course)

2006-01-23—2006-02-07; Erasmus – Socrates Programme, RESPAL (REmote Sensing for PAst Landscapes: Lecturer – **GIS and DEM**; developed this course), Slovenia

In addition to lecturing, I have been teaching the following subjects for individual postgraduates in the **GI and: spatial analysis, DEM/DTM, photogrammetry, cartography, geodesy, spatial data quality, landscape ecology, dialectology, landscape archaeology, habitats**, and other **environmental topics** – at the University of Ljubljana, Slovenia (Faculty of Civil and Geodetic Engineering, Biotechnical Faculty and the Faculty of Arts), since 2008.

A **public examiner** of more than 22 BSc, MSc and PhD theses.

### *Pedagogical (didactics) training and appointments*

2022: training: “*Contemporary monitoring and assessment methods and practices in higher education*” (4h), by University of Primorska  
2021; training: “*Higher education in the conditions of interculturalism*” (3h), by University of Maribor  
2018; 2 specialization workshops: “*Interactive learning materials*” (8h); “*Diversity and dissonance*” (8h), both by University of Ljubljana  
2017; specialization learning lab: “*Active methods for teaching in heterogeneous (multi-cultural) groups of students*” (8h)  
2016; 3 specialization workshops and courses: “*Teamwork for more active study*” (8h), by University of Ljubljana; “*Academic Teaching Excellence – English as a Medium of Instruction (EMI)*” (35h), by **British Council with Oxford University**; “*Contemporary approaches to learning and teaching*” (16h), by Slovenian Institute for Adult Education  
2015; 3 specialization workshops and training: “*Flipped learning*” (8h); “*Assessment for the quality study*” (8h), both by University of Ljubljana; “*Improving study processes using the AI method*” (8h), Ministry of Education, Science and Sport  
2014; 3 specialization workshop, study program and training: “*Rhetoric for university teachers*” (10h); completed a study program, 10 ECTS: “*Principles of higher education didactics*” (40h); “*Creating a working and learning environment for the future*” (16h), all by University of Ljubljana  
2014; appointment as an external member of the School Matura Commission  
2014; participation in e-learning materials (eGradiva) for the gymnasium (high schools) in Slovenia in the field of geography

### *Supervising (mentoring) experience with undergraduate and postgraduate students*

1996—present: 17 BSc, 1 MSc, 5 PhD, 4 young researchers, 2 Leonardo da Vinci Programme students; regularly informal mentor

Particularly:

University of Ljubljana, Slovenia: Faculty of Civil and Geodetic Engineering; Faculty of Arts, Department of Geography; Faculty of Natural Sciences and Engineering, Department of Geology; 2002—present: 13 BSc, 1 MSc, 5 PhD, 1 young researcher

University of Nova Gorica, Slovenia: School of Environmental Sciences; 2009–2011: 2 BSc;

Scientific Research Centre of the Slovenian Academy of Sciences and Arts (ZRC SAZU), Slovenia; 2001—2013: 2 Leonardo da Vinci Programme students, 3 young researchers

My former students now work for the academy, government and industry in Slovenia, Germany, Norway, Sweden, France and Australia.

### *Awards*

2011; as a supervisor of Jaroslav Obu: [Prešeren Award of University of Ljubljana](#) for best students

2010/11; as a supervisor of Erika Jež: Alumnus Optimus (award for best student of School of Environmental Sciences, University of Nova Gorica)

2010/11; as a supervisor of Jaroslav Obu: Gisdata/Esri Award for exceptional students’ results in the development and using of the geographical information systems

### *Technical experience and innovation*

Experience in computer applications: CAD and database management since 1990, GIS, cartography and RS since 1994, (spatial) statistics since 1996, ALS since 2003, various visualization software since 1994, etc. Familiar with programming languages to bring research ideas beyond the limits of common off-the-shelf analytical software.

Knowledge of programming with development algorithms (software), coding and data processing, since 1987: (Visual) Basic, QBasic, Turbo Pascal, Fortran, C, C++ (GNU), Python (including ArcPy, PyGRASS, OpenCV – computer vision, and APIs for GDAL, QGIS and SAGA GIS), RPL (Reverse Polish Lisp) using [RPN](#) (Reverse Polish Notation for HP), MATLAB and Octave, SQL, Data Analysis Expressions (DAX), HTML and JavaScript; *programming with scripts* for AutoCAD, ArcGIS [previously AML – ARC Macro Language] (including ArcGIS Pro, ArcInfo Workstation, FME, (ArcIMS), ArcGIS Server, ArcGIS Online (AGOL), ArcGIS Enterprise portal, ArcSDE) and open source GeoServer, eCognition (Developer), Google Earth Engine, Idrisi, ProVal, ERDAS Imagine, Global Mapper, GRASS GIS, SAGA GIS, QGIS; for dashboards (Power BI, ArcGIS Dashboards) TensorFlow, Protégé; *geostatistical programming languages R* (including ggplot2), SPSS Statistics, Orange; *database programming languages* dBase, MS Access, MS Excel, (PostGIS, PostgreSQL); implementation of libraries like GDAL and ImageMagick; *more creative programming scripts* for visualization IrfanView, PaintShop Pro, CorelDRAW, Adobe CS now CC (in

particular Adobe Acrobat, Photoshop, Illustrator, Bridge), *and for video editors* Adobe Premiere Pro, DaVinci Resolve, HandBrake, FFmpeg, etc. Strong Microsoft Office 365 skills. Using project management tools (MS Project, Open Workbench, JIRA, etc.).

Qualified in operating systems: MS Windows (CMD Shell, PowerShell), Linux (Bash), Unix (Unix Shell), Android.

#### *Spatial analysis and survey-related studies*

**Quantitative and qualitative** research with the development of my methods for spatial data analysis, geostatistics; mathematical modelling; the processing of various spatial data layers, satellite imagery; Monte Carlo simulations; predictive analytics and spatial data mining; spatial data conflation, integration, and multi-method approaches; digital photography/imagery enhancement; QC/QA and uncertainty management with my approaches to data/information and organizations.

**Spatial database** development and management: storage, access, transform, analyse, interpret, and implement for the massive amounts of data (spatial ETL – e.g., Power BI, RapidMiner, MS Access, ArcGIS); documentation. Good experience in establishing or maintaining a database containing large data sets and a multi-dimensional array of data (OLAP cubes), which is particularly evident in the setting up of a web GIS server platform for the Cultural and Natural Heritage Database in Slovenia (2002-2006), and a Web GIS/Geostatistics portal for the Pomurje region, NE Slovenia (2012-2013), an Archaeological data base of Central Dalmatia, Croatia (1994-1998); geospatial metadata bases for ZRC SAZU (2001-2013), UN spatial metadata base (UNGSC 2019, ESCWA 2021-2022); Database for digital elevation models processing (since 1998); Standard fundamental spatial data themes data base from various sources for the Arab region (2022), and many others.

**Studies, based on various spatial databases:** geodetic **surveying** and mapping (total stations, levels, etc.) including satellite geodesy (GNSS) (since 1994); transformation of coordinate systems and map projection (since 1993); web design and development – now DNN, WordPress (since 1997); individual house design plans (since 1985); experience in working with AWS cloud-based servers (since 2017). Knowledge of design and implementation of the internet of things (IoT), and video surveillance and protection technology (since 2014). Initiated an idea of a [COVID-19](#) (coronavirus) spatial platform in the UN and realized for Minusma on live **survey** data spatial dashboard (2020). Proposal and development of the statistical methods on **survey** data and research methodology for the project “Influence of daily individual meteorological parameters on the incidence of the acute coronary syndrome” (2018-2019). Contribution with a spatial approach to the ESCWA interdisciplinary project ‘Human development, poverty and multiple shocks in the Arab region – A geospatial analysis’ where I manipulate HDX, ACLED, DHS **survey** data, topographic data and highly pre-processed spatio-temporal data like as land cover (2022). From **survey** data in various countries (Croatia, Slovenia, Mexico, Albania, Austria) I modelled mental maps and maps from predictive models based on social and environmental variables (since 1994).

#### *Software, analytics intellectual property and standardisation training*

2021-03-10—24: “*Cloud Skills Challenge: Microsoft Ignite Data Analyst Challenge*” (16 modules, 18 hr 7 min), by Microsoft

2021-03-11—14: “*Microsoft Certified: Azure Data Fundamentals*”, by Microsoft

2017-04-17; workshop: “*The use of patent databases and patent information*” (4h), by The Slovenian Intellectual Property Office (SIPO), Slovenia

2015-07-13—17; 2 trainings: “*Introduction to ArcGIS Pro for professionals*” (16h); “*Web GIS: Using the ArcGIS Platform*” (24h), both by ESRI, UC Davis, USA

2014-09-17; training: “*SIST/ISO standards*” (8h), by Slovenian Institute for Standardization (SIST), Slovenia

2000-06-18—24; specialization workshop: “*Perspectives on Spatial Analysis in the Social Sciences*” (7 days) by Center for Spatially Integrated Social Science, UC Santa Barbara, USA

1998-02-03; training: “*Introduction to SPSS*” (8h), by University of Ljubljana, Slovenia

1995-11-28—30; training: “*User applications of ERS SAR Data*” (24h), by ESRIN, Frascati, Italy

#### *Innovation, intellectual property of the research results, independent thinking*

Independent thinking qualities are demonstrated through numerous initiatives and activities (see the details in other sections). Here are exposed major accomplishments:

<i>Innovation (in Disciplines)</i>	<i>Usability and Impact</i>
<b>Positional and semantic conflation</b> (integration/fusion) from multi-source data of different quality ( <i>for spatial databases enrichment &amp; improvement</i> )	<a href="#">Digital Elevation Model (DEM)</a> of Slovenia with its surroundings in multi-resolution 12.5, 25 and 100 m (national standard since 2005), DEM 12.5 was integrated into the European model and the improved Google Earth model ( <i>up to</i>

	<i>25-times reduced cost and considerably better quality of the final product)</i>
<b>Analytical hill shading</b> in cartography: <i>generic technique for spatial analytics, feature detection and recognition, geovisualization and photography (it reveals details in a DEM and other surfaces), image processing</i>	<a href="#">Multidirectional Visibility Index</a> (MVI) has been implemented in alluvial fans/talus cones prediction, mountain highs, karst depressions detection and description, visual quality control and aerial photographs enhancement; the algorithm was used for mountain highs detection and applied in the Esri World Topographic Map ( <i>multi-applicable generic method</i> )
<b>Geomorphometric indices:</b> <a href="#">‘Relief Above’ (RA)</a> , <a href="#">‘Relief Below’ (RB)</a> , <a href="#">‘Ridge-Drainage’ (RD)</a> , <a href="#">‘Rim’ (RI)</a> , <a href="#">‘Concave-Convex’ (CC)</a> , with the <a href="#">Annular-shaped Moving Window (AMW)</a> and <a href="#">Annular-Shaped Ring (ASR)</a> approaches, as well as <a href="#">Multidirectional Visibility Index</a> (MVI). ( <i>spatial analysis, reclassification, visualization, visual analytics, etc.</i> )	<i>Later on, I found out that my Concave-Convex (CC) approach is equal to the Topographic Position Index (TPI). I consider the CC as one of the powerful approaches to define a relative (local) relief, whereas the ‘Relative Relief’ (RR) of the MVI has a similar concept, but is in its nature more global with multi-scale impact</i>
<b>Geomorphologically high-quality DEM for geovisualization</b> ( <i>cartography: enhanced topographic edges and multi-scale appearance</i> )	<a href="#">Landform Map</a> of Slovenia in scale 1:250,000 has been used in all high schools in Slovenia since 2005 ( <i>applying various relief visualization techniques, including own techniques, bump mapping, etc., to a standard topographic map production</i> )
<b>Archaeological field mapping</b> process with real-time quality control ( <i>surveying, GNSS, data sampling, spatial analytics</i> )	Maya settlement models (DSMs) & maps in Yucatán, Mexico, since 2004 ( <i>considerably better mapping accuracy, faster mapping &amp; implementation of a survey in low resource setting</i> ); Developed software geodetic adjustment
<b>Participatory management on relation between individual and group</b> tasks, based on geostatistical pattern research ( <i>crowdsourced data, didactics</i> )	Individuals respond better to constructive critical judgement, giving them a deeper understanding and creative thinking approach; groups are more successful in finding unique differences, where synergy effect is an important factor ( <i>improved capacity building</i> )

### ***International invited presentations, conferences, advanced schools, outreach activities***

The first keynote lecture I had at the Archeologia e informatica Conference in Rome in 1995 was my good fortune. Since then, invited to give lectures at the following universities/research institutes: Faculty of Philosophy, Zadar, Croatia; Vienna University of Technology, Austria; Faculty of Sciences at the University of Novi Sad, Serbia; Université de Franche-Comté, Besançon, France; Institut de Recherche de l'École navale (IRENav), Brest, France; University of Nova Gorica, Slovenia; University of Ljubljana, Slovenia; University of Otago, Dunedin, New Zealand; Slovenian Environment Agency; Natural Sciences Society of Slovenia; National and University Library of Slovenia; Geomorphological Society of Slovenia; University of St Andrews, UK; ICARDA, Amman, Jordan; Stockholm University, Sweden; University of Glasgow, UK; Skoltech, Russia; University of Plymouth, UK; Queen's University Belfast, UK; (Cardiff University, UK, University of Iceland, Iceland, British Geological Survey, UK).

Also, delivered a number of guest lectures at conferences and governmental institutions (e.g. for AGILE, ICA, ISPRS). Chaired several conferences and presented my research results at national, regional and local levels. Research outreach, animated simulation effects of sea level rise on the Slovenian coast, was presented in Ljubljana, Slovenia, 2008 for the Nobel laureate **Al Gore**'s visit.

Contributed to a number of **popular scientific articles**, more than **52-times**: [Delo](#) (2015, 2012, 2007, 2006, 1999, 1997, 1996:4-times), [Proteus](#) (2013), [Gea](#) (2013, 2002), *Geodetski vestnik* (2013, 2004:3-times, 2003, 1994), [Planinski vestnik/Slovenian Alpine Journal](#) (2008), [Življenje in tehnika/Life & Technology](#) (2006), [Monitor](#) (2001, 1999), [Geografski obzornik/Geographic Horizon](#) (1998, 1996:2-times), *Slovenec* (1996:10-times, 1995:7-times, 1993), [Nedeljski dnevnik](#) (1996), *Republika* (1995:3-times, 1994:2-times, 1993), *Naša komuna* (1993). **References to articles** in Wikipedia: [‘Digital elevation model’](#) [‘Cetina’](#), [‘Trilj’](#), [‘Gardun’](#).

### ***Media & communication***

**Biography:** [Personalities : Great Slovenian Biographical Lexicon; Podobnikar, Tomaž](#) (*Osebnosti : veliki slovenski biografski leksikon*), Ljubljana, Mladinska knjiga, 2008.

**Interviewee 18-times** in Slovenian, Croatian, Swedish and Dutch: [Radio Slovenia](#) (2020), [Folklornik](#) (2014), Radio Triglav (2009:2-times), [Lider](#) (2008), [Finance](#) (2007), [Slovenske novice](#) (2007), [Več](#) (2005), [Večer](#) (2002), [Nedelo](#) (1999), Geopinie (1997), [Glasbena mladina \(GM, Muska, Glasna\)](#) (1996, 1994, 1993, 1991), Radio glas Ljubljane (1995), Radio Dur (1995), [Dala-demokraten](#) (1991).

Several times **other media appearance**: [Ona Plus](#) (2018), [TV Slovenia](#) (2007) [Delo](#) (2007, 1982), [Muska \(Glasbena mladina, GM, Glasna\)](#) (2002, 1997), [Nedeljski dnevnik](#) (1996:2-times), [Maneken](#) (1977), and more.

#### *Media and communication training*

2018; 2 specialization workshops: “*Public engagement and popular science writing*” (6h); “*Conflict solving*” (8h), by University of Ljubljana

2016; training and specialization workshop: “*Preparing video tutorials suitable for web publishing*” (individual treatment), by Vision ONAIR; “*Successful public speaking in English*” (15h), by University of Ljubljana

2015; specialization workshop: “*Science through the perspective of ethics, integrity/responsibility, gender*” (13h), by University of Ljubljana

2014; specialization workshop: “*Management of business processes at educational institutions*” (4h), by University of Ljubljana

2013; specialization workshop: “*Organizational culture and its effects on communication and the way of working in teams at the University*” (8h), by University of Ljubljana

2010; specialization workshop: “*Communication and interpersonal relations of professionals in the workplace*” (6h), by University of Ljubljana

#### *Other skills and community service*

Fluent in Slovene (mother tongue), English, Serbian (read Cyrillic) and Croatian. Speak/understand also a basic level of German, Italian, Spanish, Russian and French.

My team building skills have been proven in national, international and regional regattas in various categories: Fireball, J24, and open class. As a skipper, I recently won several sailing regattas and even a match race. Actively participated as a volunteer in Scout Association of Slovenia and at International Workcamps Bremen, Germany in 1990 and 1995 (Arbeit für den Frieden).

My extracurricular interests are cross-disciplinary: sailor (skipper), musician (musical saw), photographer, mountaineer, scuba diver, chess player. Created a number of opportunities to present my research and play different styles of music I appeared in interviews on radio and TV, in newspapers and magazines, and on audio CDs. As a musician, I enjoy playing on various instruments, especially the singing saw. I feel honoured to be invited (solo and with a group) to perform at concerts all over the world, but the most prestigious of all was the concert in the Slovenian Philharmonic. As an active member of the administrative board of the Slovenian Cultural and Ethnomusicological Society, I gave lectures on “Selected topics in ethnomusicology” at the Faculty of Arts, University of Ljubljana. I am interested in photography (4 photography exhibitions, e.g. [One Planet, One Water, Burma](#) – the land of modern stilt houses, an accompanying exhibition of the [Wheel - 5,200 Years](#)) and enjoy learning about cultures and wildlife, which I have discovered on my travels to over 80 countries, by bicycle, on foot (including mountaineering and ski touring) and by sailing boat. I am a certified scuba diver with experience in the Adriatic Sea, Great Barrier Reef, and the Fiji Islands. I designed and built one of the first eco houses in Slovenia.