

Tomaž Podobnikar – Curriculum Vitæ

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I am fascinated by innovation and science. What could be more satisfying than unravelling a problem that was considered unsolvable? A deep understanding of natural and social phenomena in geospace over time is paramount before discovering viable technical solutions. Taking a wide-ranging perspective, I discovered that art and science make excellent bedfellows.

Geospatial Information Expert – consultant, civil servant, Scientific Councillor, lecturer and supervisor (PhD, MSc, BSc), recently a **Sustainable Development Officer** with **25+ years of experience** in the areas of geospatial, environmental, natural and social sciences/fields, Earth observation, hazard and risk management, project/programmes evaluation, etc. at 13 academic, governmental, NGO, IGO (UN) and consulting organizations in 9 countries. **Simplifier and constructor** of new algorithms. Able to build every aspect of digital, from the **front end to the back end and everything in between**. Career highlights include **strong leadership** (head of the dept., GIS chief). Fieldwork in ecological, archaeological, anthropological and geomorphological mapping, geodetic survey and humanitarian in **resource-limited settings**. Designed and delivered courses in GIS/RS, cartography, spatial data and information quality, and digital terrain modelling. Documented innovative methods and technical solutions: [1] spatial data integration/conflation with semantic enrichment to **reduce the cost of digital elevation model (DEM) up to 25-times**, realized for the National DEM and implemented into the EU and Google Earth models; [2] geomorphometry based index for feature detection and recognition, visualization and photography enhancement, used in the Esri World Topographic Map; [3] methodology to pre-process any geospatial data with special tools to make them 'analytics ready', realized for the ESCWA Spatial Data Infrastructure and will be realized with ESA (€150m). Awarded with over 25 competitive grants including Skolkovo Innovation Center and **Fulbright**.

Core Skills and Qualifications

- **Team leader** (Head of the dept., Chief GIS and other leaderships) and **team player**; **cross-disciplinary** and **multicultural** involvements; governance.
- A proficient, self-motivated **researcher**, R&D, **teacher** (lecturer, supervisor), **trainer**, **consultant**, professional communicator.
- **Publications**: [Google Scholar](#), [Semantic Scholar](#), [ORCID](#), [ScopusID](#), [ResearcherID](#), [COBISS](#); **1500+ citations** **H-index 20** with the most cited paper being cited 122-times; **editorial board of the 7 journals**, edited 8 monographs/special issues, **reviewed 210+ papers**.
- **Designed and managed** 30+ and contributed to 100+ international projects, of which 20+ with industry.
- **Evaluated** 75+ scientific and industrial international projects.
- **Fields of interest**: applied sciences (natural, social, environmental, engineering), Geosciences, Geoinformatics, Geomatics, GIScience, GIS, cloud GIS, Earth Observation, geospatial data science, Spatial Data/information/knowledge Infrastructure (SDI), Spatial Data Engineering, geodesign, algorithm design, spatial database design and management, GIS, remote sensing, geomorphometry, Lidar, photogrammetry, cartography, satellite image processing, location-based services, GeoAI and machine learning, spatial generalization, spatial reasoning, cognition and decision making; satellite **geodesy** (GNSS), surveying and mapping; computer programming, VM, AR and VR, environmental geography, hazard and risk management, spatial modelling for conservation (environment, cultural heritage), climate change issues, space research, landscape archaeology, palaeoenvironmental analysis, social networks.
- **Computer applications**: CAD and database management since 1990, GIS, cartography and RS since 1994, (spatial) statistics since 1996, Lidar since 2003, various visualization software since 1994. Familiar with programming languages like Python and C to bring developed algorithms beyond the limits of common off-the-shelf analytical software.
- **Links**: [ResearchGate](#), [ACADEMIA](#), [Portfolio \(YouTube\)](#), [SCGIS](#)

Professional Experience

Ministry of Natural Resources and Spatial Planning, Slovenia

2023-11 – current

Undersecretary

Direct assistance in managing professional tasks within the scope of the ministry's or internal organizational unit's work. Leading project teams. Participation and execution of tasks within the Recovery and Resilience Plan "Green Slovenian Location Framework". Independent development of systemic solutions and other most demanding documents. Performing other most demanding tasks. Leading and participating in the most demanding project teams.

University of Ljubljana / Faculty of Information Studies in Novo Mesto, Slovenia

2023-04 – current

Associate Professor

Deliver innovative and effective teaching, teaching curriculum (courses), and learning materials, attracting students from different disciplines and involve GIS in new disciplines curricula. Supervision international and other PhD students. Teaching in the doctoral study 'Built Environment', for two courses that I developed: "Digital terrain modelling for natural hazards assessment" (mainly for civil engineers); "Management of spatial data quality" (mainly for geodesists). Teaching undergraduates: "Quality of Information" and "Geographic Information Systems" (lectures, tutorials, lab work).

United Nations, ESCWA, Lebanon

2021-09 – 2023-03

Sustainable Development Officer, Regional Advisor

Managed 3 ICT specialists. Worked for [1] Information Communication Technology Section (ICTS); [2] Statistics, Information Society and Technology dept., and [3] Climate Change and Natural Resource (Arab Centre for Climate Change Policies) dept. Proposed conceptual frameworks for humanitarian risk models, and spatial data infrastructure. Developed optimized solutions for several projects aimed to deliver state-of-the-art GIS and remote sensing solutions. Provided technical solutions for organizational GIS and remote sensing software. Prepared and provided training, lectures, and consultancy on numerous geospatial topics, from GIS roots to cartography, geodesy, photogrammetry, remote sensing, image processing, database development, spatial analytics, visual analytics, geovisualization, etc. Promoted interdisciplinarity and cross-lateral solutions and systematic "geospatial reasoning". Collaboration with UN-GGIM – Arab States and numerous other UN agencies, especially in Lebanon in the fields of GIS, EO, cartography and geodesy.

United Nations, MINUSMA, Mali

2020-01 – 2020-08

Chief GIS, Geospatial Information Officer

Managed 12 employees. Leadership and HR Management. As leader of the GIS Unit, the FTS (Field Technology Section) took on the responsibility of integrating gender perspectives into our work. Collaborated across disciplines with MINUSMA colleagues to achieve our organizational goals, and valued others' ideas and expertise by actively soliciting input. Supported the organization's decisions and shared credit for team accomplishments, while also accepting joint responsibility for team shortcomings. Technological Awareness: Employed an in-depth knowledge of the latest technological developments in GIS, image processing, the internet of things (IoT), GNSS, and web applications. Considered the applicability and limitations of technology in office work and stay up-to-date on available technology, proactively seeking to apply it to appropriate tasks.

United Nations Global Service Centre, Italy

2019-05 – 2020-01

Geospatial Information Officer

Managed geospatial databases and provided geospatial platforms, solutions and services to clients. Outreach, business partnerships and partnership with field missions and UNHQ. Supported NYHQ goals for the "Cloud-first" initiative and managed cloud instances as per guidance from NYHQ and SGITT. Employed efficient project and service management. Complied with organizational security regulations. Strengthen the institutionalization of FTS project/program management and associated Governance Process.

University of Ljubljana, Slovenia

2009-11 – 2019-06

Associate Professor

Mentored 15 BSc, 1 MSc, 5 PhD, 1 young researcher. Worked for Faculty of Civil and Geodetic Engineering, Research Institute of Geoenvironmental and Hydrological Threats – RIGHT (2014-2019), and Department of

Geodetic Engineering (2009-2014). As a researcher, developed advanced methods for spatial models, particularly in fields of geomorphometry, spatial statistics, AI, georadar, and spatial data integration, mostly in the field of degradation of landscapes and hazard management due to climate changes. As a professor, developed courses and taught and supervised students at different levels, such as “Photogrammetry II” (tutorials for graduate students), and many others. Proposed research ideas in the field of flipped and collaborative learning.

Oxford Policy Management Ltd, United Kingdom

2013 – 2018

External Consultant

Consulting in the fields GIS, spatial predictive modelling, spatial statistics, and environmental science for developing countries, e.g. for “Identifying Frontiers of Digital Financial Services in Tanzania”.

School of Advanced Social Studies in Nova Gorica, Slovenia

2008 – 2013

Assistant Professor

Managed 1 employee. Delivered innovative and effective teaching, teaching curriculum (courses), and learning materials, attracting students and involve GIS in new disciplines curricula. Teaching activities: “Quality of Information” (lectures, tutorials, lab work).

Scientific Research Centre of the Slovenian Academy of Sciences and Arts, Slovenia

1995-11 – 2013-06

Scientific Councillor (Research Advisor), Head of the Department

Managed 5 employees, supervised 2 Leonardo da Vinci Programme students, and 3 young researchers. Through leadership, management, mentoring, lecturing and supervising, conducted international teams, of researchers, students, technical staff and other stakeholders, and engaged them in projects, programmes, innovative advanced research, studies, applications, conferences, etc. Ensured the development of novel methods in the fields of natural and cultural environment spatial analysis in GIS, geomorphometry, advanced archaeological prediction modelling to optimise the fieldworks, integration of geodetic survey and GIS-based mapping techniques for the fieldworks, etc. Apart from delivering lectures for students, global public and professional audiences and fellows, ensured education in the following subjects for individual postgraduate students: Cartography, GIS and environment, GIS and dialectology, GIS and habitats, at the Faculty of Civil and Geodetic Engineering, Biotechnical Faculty and the Faculty of Philosophy (University of Ljubljana), since 2008.

Mura Regional Development Agency Ltd, Slovenia

2012-10 – 2013-09

Project Manager and Consultant

A leader and consultant for the application of advanced research in regional development through the EU development project “REG-NET, Slovenia – Hungary”. Preparation and management of project workshops.

University of Nova Gorica, Slovenia

2008-10 – 2011-08

Assistant Professor

Managed 5 employees and successfully supervised 2 BSc students, one of them got awards. As a fellow at the School of Environmental Sciences in higher education, developed and lectured two courses: “Environmental Information Systems and GIS” with tutorials for undergraduate students, and “Geographic Information Systems” with tutorials for postgraduate students. In addition, lead a team of researchers in an interdisciplinary field after successfully acquired an international project. Managed this project.

Vienna University of Technology, Austria

2007-01 – 2008-12

Project Assistant

Employed to contribute as a researcher, supervisor and project manager in the series ESA Mars Express projects, as well as in Christian Doppler Laboratory “Spatial Data from Laser Scanning and Remote Sensing”, at the Institute of Photogrammetry and Remote Sensing. The main research topics were: planet Mars exploration, developing algorithms for enhanced digital terrain model (DTM) production and methods for lidar applications development. They included novel methods for quality control, geomorphological extraction of different terrain features, and geovisualization. Other research activities were: remote sensing applications in invasive plants, applications in environmental archaeology, and natural hazards and risks management applications (launched all 3 projects).

At the Surveying and Mapping Authority of the RS, involved in operative work, research and administration in various fields, such as geodesy, GIS, photogrammetry, land surveying, cartography, remote sensing, spatial database design and management, and national coordinate systems transformation.

International mobility (postdocs, research visits)

Realized **9 research periods** of at least 1 month, altogether 15 months:

- **Fulbright Visiting Scholar Program** (grant); Department of Marine Geosciences - Rosenstiel School of Marine and Atmospheric Science, University of Miami, USA, 2019
- **Quality Researcher** (grant); C.N.R.S., Laboratoire de Chrono-écologie, Université de Franche-Comté, Besançon, France, 2006
- **Research Expeditions** (National Geographic Society CRE grant); South Campeche, Reserva de la Biósfera de Calakmul, Yucatán and Mexico City, Mexico, 2004 and 2005
- **Visiting Researcher** (grants); Institute of Photogrammetry and Remote Sensing, Vienna University of Technology, Austria, 1999, 2000 and 2001
- **Visiting Researcher** (grant); Faculty of Geodesy, Delft University of Technology, The Netherlands, 1997
- **Research Expedition** (grant); Island of Brač, Croatia, 1994

Education**PhD (Doctor of Science)**

University of Ljubljana
1998 to 2001

MSc in Geodesy

University of Ljubljana
1995 to 1998

BSc (Bachelor of Geodetic Engineering)

University of Ljubljana
1991 to 1995

Professional Membership

- **ELISE** (The European Location Interoperability Solutions for e-Government), since 2020
- **European AI Alliance**, since 2018
- **SCGIS** (Society for Conservation GIS), since 2015
- **IUGG** (Slovenian Association of Geodesy and Geophysics), since 2012
- Geomorphological Society of Slovenia, since 2010
- Section for Cartography at the Association of Surveyors of Slovenia, since 2009
- **ICA Commission on Cartography in Early Warning and Crises Management** (International Cartographic Association), since 2009
- **ICA Commission on Generalisation and Multiple Representation** (International Cartographic Association), since 2009
- **ICA Commission on Mountain Cartography** (International Cartographic Association), since 2007
- **EGU** (European Geosciences Union), since 2007
- **IAHS** (International Association of Hydrology Sciences), 2007-2010
- **AGILE** (Association Geographic Information Laboratories Europe), 1998-2012

Leadership

- **GIS Chief** of GIS Unit, Field Technology Section (FTS), United Nations, Mali, 2020
- **Co-founder** of Vedomec, Institute for the Spatial Culture, Slovenia (on my initiative), 2011-2015
- **Head of the Department of Environmental Studies** of the Institute of Anthropological and Spatial Studies, Scientific Research Centre of the Slovenian Academy of Sciences and Arts, Slovenia (established on my initiative), 2007-2013

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

Editor

Editorial Board and member of the scientific committees: Remote Sensing journal, MDPI, [Topic Editor](#), since 2021, and Section Editor “[Remote Sensing in Geology, Geomorphology and Hydrology](#)”, since 2019; Geoinformatics FCE CTU, since 2016; IJEES, since 2015; ISPRS Journal of Photogrammetry and Remote Sensing, 2013–2016; Journal of Geodesy, 2010–2014; Geographical Information Systems in Slovenia, since 1997 (also organized biennial symposiums). **Edited** following monographs and special issues:

- [Geospatial Data Quality: Unraveling the Essentials](#), Revue Internationale de Géomatique, 2023
- [Spatio-Temporal Analysis of Urbanization Using GIS and Remote Sensing](#), Special issue, MDPI, 2022
- [Perspectives on Digital Elevation Model Applications](#), special issue, MDPI, 2021
- [Advances in Global Digital Elevation Model Processing](#), special issue, MDPI, 2020
- [Universal Ontology of Geographic Space: Semantic Enrichment for Spatial Data](#), monograph, IGI Global, 2012
- Geographical Information Systems in Slovenia, monographic series, ZRC Publishing, 1998, 2000, 2002, 2004, 2006 (5 monographs)

Expert tasks: Reviewer, Evaluator and Board Membership

A reviewer of 49 international journals. Reviewed 210+ papers. Refereed 2 monographs, 7 national and 5 international projects. An **evaluator and a referee** (wrote experts’ reports) of **55+ national and 15+ international programmes and projects** (basic research, applied science and industry – R&D) since 2003 (Slovenia, Czech Republic, Belgium, Bulgaria, Croatia, France, Montenegro, Netherlands). Registered an active **expert, evaluator or board member** of:

- EQA (European Quality Assurance), since 2023
- MCST (Malta Council for Science and Technology), 2021-2025 (evaluator board)
- Fulbright: Fulbright Senior Award, 2019, 2021 (evaluator board)
- IBF International Consulting, since 2018
- Montenegrin Ministry of Science, since 2018 (evaluator board)
- COST (European Cooperation in Science and Technology), since 2018 (expert board)
- MSCA-IF (Marie Skłodowska-Curie Individual Fellowships), 2017 call (evaluator board)
- Ministry of Economic Development and Technology, Slovenia, since 2017 (evaluator board)
- SPIRIT Slovenia (Public Agency for Entrepreneurship, Internationalization, Foreign Investments and Technology), since 2017 (evaluator board)
- Ministry of Science and Education, Croatia, since 2017 (evaluator board)
- CMEPIUS, 2016-2020 (evaluator board)
- REGIO (to support Cohesion Policy, regional and urban development) of the European Commission, since 2016 (experts board)
- Horizon 2020 Advisory Groups (European Commission), since 2014 (evaluator board)
- Ministry of the Environment and Spatial Planning of the Republic of Slovenia, “Preparation of the starting points for the recording terrain with lidar”, 2010-2011 (Independent government consultant for the high-resolution lidar terrain models)
- ARRS (Slovenian Research Agency), 2003-2008 (evaluator board)

Innovation

Multi-source spatial data conflation (merging with enrichment) 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 by up to 25 times has been realized for the [National DEM of Slovenia](#) (32 data sources!) and Central Dalmatia. The improved solution received “Spatial data integration, Space Technologies and Telecommunications” and “Information Technologies” grants with excellent scores from the Skolkovo Innovation Center (2018). This methodology is one of the future trends in geospatial technology.

Multidirectional Visibility Index (MVI). The generic and multimodal solution is 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 peaks, karst depressions), geovisualization (visual quality control) and photography (imagery enhancement with image processing). The solution for the recognition of the geomorphological peaks was used in the Esri World Topographic Map.

Mapping process with real-time quality control that employed surveying, GNSS, data sampling and spatial analytics. The [challenges](#) in conducting this method have been in resource-limited settings. I developed that innovative method for ancient Maya settlement models and maps in Yucatan, Mexico, which led to significantly better surveying accuracy and faster mapping.

Time-series algorithm for generating GIS layers that involve palaeo relief simulations, automated historical maps analysis and cartographic methods. The results were used for the film “Nature and the City”, produced by the City Museum of Ljubljana.

Participatory management on the relation between individual and group tasks. The method is based on spatial statistic pattern research, which was involved in crowdsourced data. The main findings were that individuals had better respond to constructive critical judgement, have a deeper understanding and a more useful approach to creative thinking. Groups are more successful in finding unique differences, where the synergy effect is an important factor. The findings have been used for didactics, mapping purposes, as well as better capacity building.

Spatial Data Infrastructure (SDI) with properties: [1] high interoperability; [2] Fundamental Data Themes; [3] standard scale levels; [4] solution to avoid edge effect and boundary problem; [5] standard CRSs and map projections; [6] naming convention; [7] traditional and web maps publishing; [8] metadata and catalog of data/services; [9] files operational for an average laptop. Around 7-times reduced cost and considerably better quality of the final product.

Selected software, from architecture to the final product: Coordinate Transformer 1.0, Top Topography (last version 2.0), Visibility Shader (last version 2.0) Peak Mapper (last version: 3.0).

Funding and Research Projects

Very successful in **obtaining research grants** at national, regional, EU and other international levels. Active participation as a major team player, in **90+ national and international cooperation projects** in Slovenia, Croatia, North Macedonia, Italy, Austria, Hungary, France, Russia, Mexico, Mali, Lebanon, 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 very good networks of people from EU countries and other parts of the world.

Successfully designed and raised competitive research funds for 20+ projects, managed and executed them (e.g. co-financed by the ERDF: FP6, FP7), and participated in **18+ joint cooperation projects with industry**, co-financed by Skolkovo Foundation, Telekom, DARS, etc. The work includes numerous 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 – in the framework of Interreg programs, Central Europe, Inter-American Development Bank, National Geographic (CRE grant).

Accepted by **9 competitive start-up projects in the industry** on spatial data handling topics with the following acronyms: SmartDEM (UiG, 2021; Future 4.0, 2020; Skolkovo Foundation, 2014, 2017, 2018) and Top Topography (INITS, 2019). Using project management tools (MS Project, PlantUML, Open Workbench, JIRA, etc.).

Spatial analysis and survey-related studies

Quantitative and qualitative spatial data processing with the development of novel algorithms and methods for spatial data analysis, spatial statistics, geostatistics, visual analytics, spatio-temporal analysis, network analysis; mathematical modelling; processing of various spatial data layers, satellite imagery; Monte Carlo simulations; predictive analytics and spatial data mining; spatial data conflation, integration, fusion and

multi-method approaches; spatial feature engineering; digital photography/imagery enhancement; spatial data quality and uncertainty with innovative approaches to data/information management.

Spatial database development and management: storage, access, transform, analyse, interpretation, and implementation for 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 database 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 database 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 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).

Programming, architecture, algorithms, and application development

Computer applications: CAD and database management since 1990, GIS, cartography and RS since 1994, (spatial) statistics since 1996, Lidar since 2003, and various visualization software since 1994.

Programming coding: Familiar with programming languages to bring developed algorithms beyond the limits of common off-the-shelf analytical software: (Visual) Basic, Fortran, C, C++, Python (including ArcPy, PyGRASS, OpenCV, Matplotlib, PySAL, GeoPandas, Fiona, NumPy, and APIs for GDAL, QGIS, SAGA GIS), RPL using RPN (Reverse Polish Notation for HP), MATLAB and Octave, SQL, SQLite, Data Analysis Expressions (DAX), UML, LaTeX, HTML and JavaScript; programming with scripts for AutoCAD, ArcGIS [previously AML – ARC Macro Language] (including ArcGIS Pro, ArcInfo Workstation, FME Workbench, ArcGIS Server, ArcGIS Online, ArcGIS Enterprise portal, ArcSDE), open source GeoServer, eCognition, Google Earth Engine, Idrisi, ERDAS Imagine, Global Mapper, GRASS GIS, SAGA GIS, QGIS; for dashboards (Power BI, ArcGIS Dashboards); TensorFlow; spatial statistical programming in R (including ggplot2), Orange, SPSS; database programming in dBase, MS Access, MS Excel, PostGIS/PostgreSQL, SQLite, Python; implementation of libraries like GDAL, ImageMagick and FFmpeg; 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 and DaVinci Resolve, etc. Microsoft Office 365 skills. **Operating systems:** MS Windows (CMD Shell, PowerShell), Linux (Bash), Unix (Unix Shell), Android.

Fieldwork and research expeditions

Having contributed to several fieldwork projects own scientific outputs were improved during the process. The main areas of fieldwork are **ecological, archaeological, anthropological** and **geomorphological mapping**, based on my **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, and EUREF MAK'96 to name a few. The other types of fieldwork 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 as Main Author

Written, participated in, or actively contributed to more than **55 original scientific papers** for journals, 27 monographs, 54 popular science articles, 7 national, and 60 international conferences and meetings. A complete list of publications (currently 615 records) is documented in COBISS, [Personal Bibliographies](#). The representative publications are in chronological order (all references are available upon request):

- Palacios-Prado, N., Corominas-Sustach, F., Pérez, A.; Verdugo, D., **Podobnikar, T.** 2024: Encoded Landscapes: A Link between Inka Wall Orientations and Andean Geomorphology. *Land*, 13, 463. <https://doi.org/10.3390/land13040463>
- **Podobnikar, T.** 2023: ESCWA Spatial Data Infrastructure (SDI) Governance. *Standard Operating Procedure (SOP)*
- 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](https://doi.org/10.3390/rs12081228) (cited 17 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](https://doi.org/10.3390/rs11121457) (highly accessed article in July and August 2019) (cited 12 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](https://doi.org/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](https://doi.org/10.1071/WF15192) (cited 14 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](https://doi.org/10.1016/j.pss.2014.11.019) (cited 10 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](https://doi.org/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](https://doi.org/10.1179/1743277412Y.0000000012) (cited 14 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](https://doi.org/10.1111/j.1467-9671.2012.01335.x) (cited 50 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](https://doi.org/10.1016/j.jag.2012.05.004) (cited 122 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 121 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 75 times)

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Honours and Awards

Awarded with 25+ competitive grants including **Fulbright** and Skolkovo Innovation Center, as well as:

- Certificate of Outstanding Contribution in Reviewing of the ISPRS Journal of Photogrammetry and Remote Sensing, 2014
- Prešeren Prize for Students of the University of Ljubljana (as supervisor of Obu, J.), 2011
- Alumnus Optimus, Award for best student of School of Environmental Sciences, University of Nova Gorica (as supervisor of Jež, E.), 2010/2011
- Gisdata/Esri Award for exceptional students' results in the development and using of the geographical information systems (as supervisor of Obu, J.), 2010/2011
- First prize for the poster; Čeh, M., Smole, D., Podobnikar, T. Geodata: Are they accessible and usable?, 2004; 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.