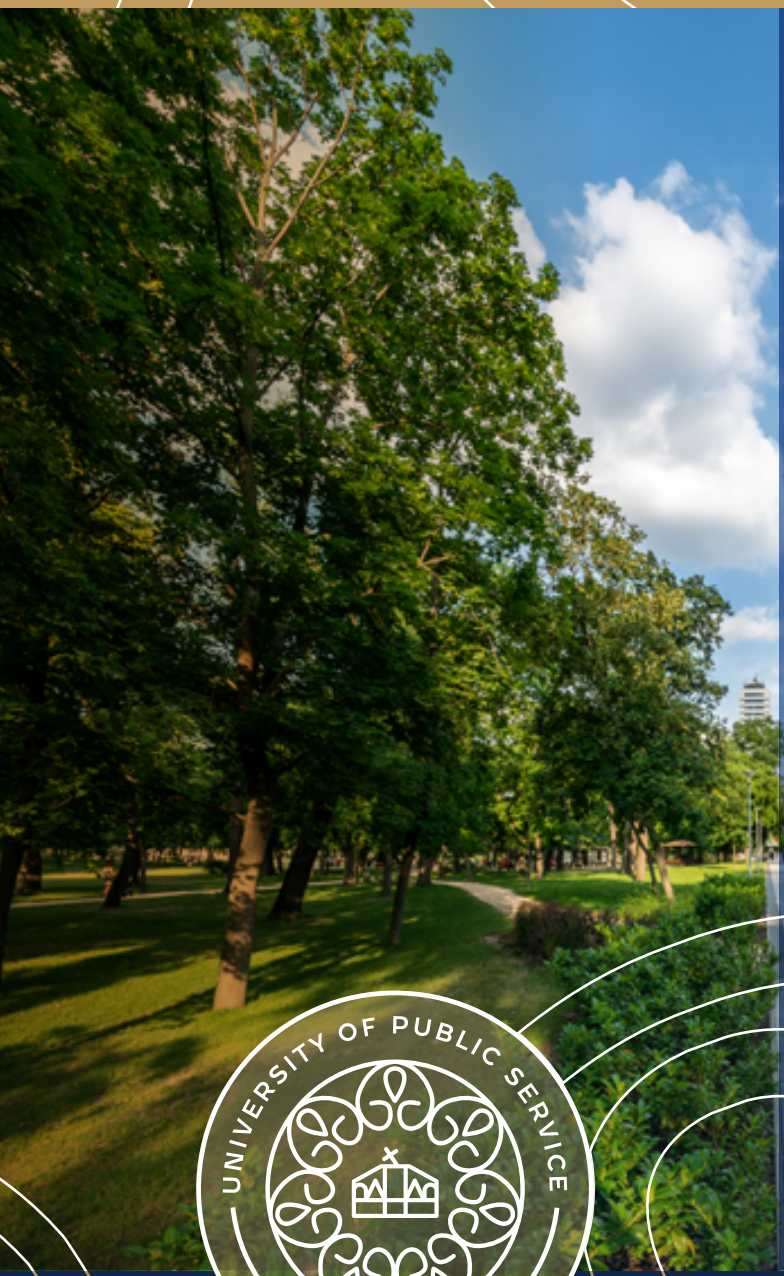
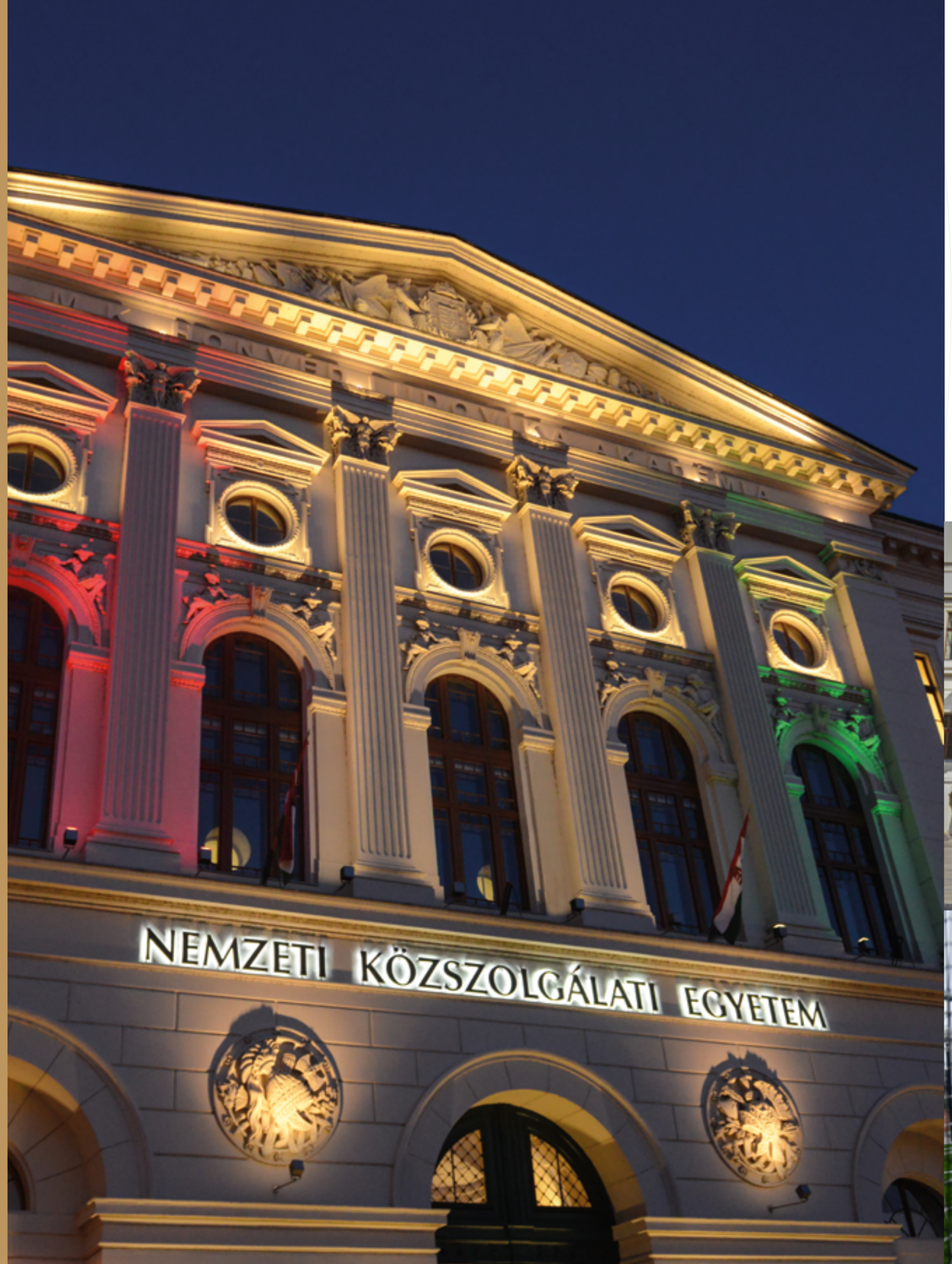
UNIVERSITY OF PUBLIC SERVICE



AS A UNIVERSITY OF SUSTAINABILITY

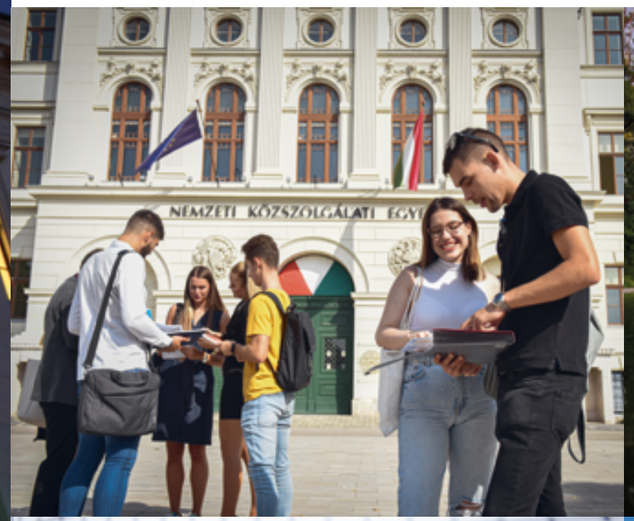


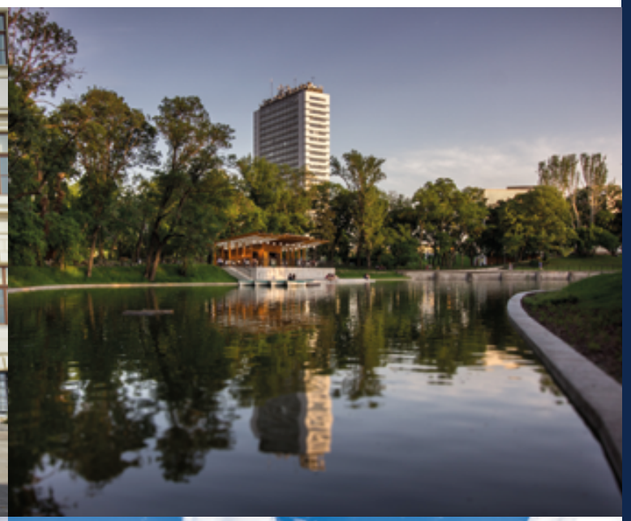
Introduction to UPS

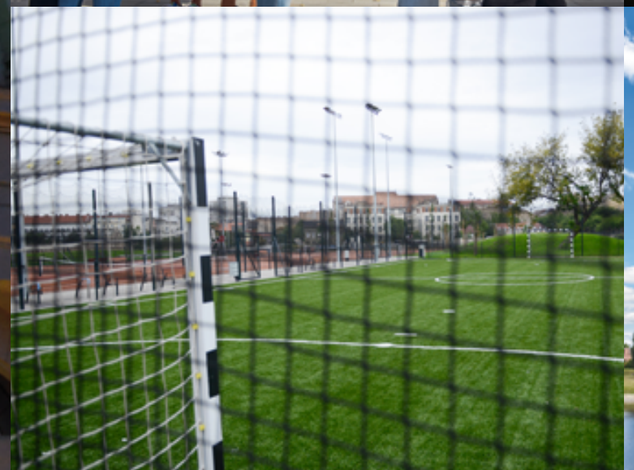
The University of Public Service (UPS) was established in 1 January 2012 with the aim of training professionals for the domestic and international public administration, law enforcement and defense sectors. As of today, UPS has four faculties, the Faculty of Military Science and Officer Training, the Faculty of Law Enforcement, the Faculty of Public Governance and International Studies and the Faculty of Water Sciences, four doctoral schools, a dedicated research hub (Eötvös József Research Centre), and four inter-faculty Institutes. Located in the heart of Budapest, the Ludovika campus has 26 hectares of green area, providing a great environment for getting away from the noise of the city. The campus is the place for those who seek active recreation, as it offers a wide choice of indoor and outdoor sport facilities including a running track, swimming pool, gyms and an indoor shooting range. The park offers cultural programs and various leisure activities not only for students but also for the public. The renovated historical facilities and the new Educational Centre bear the infrastructural qualities of leading European universities.

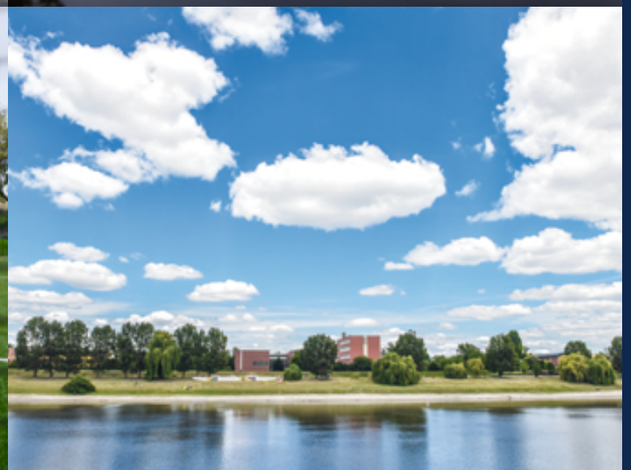
Mission Statement

„It is the school's job to teach us how to learn, to arouse our appetite for knowledge, to teach us the joy of job well done, and the excitement of creation, to teach us to love what we do and to help us find what we love to do." *(Albert von Szent-Györgyi, 1893-1986, Hungarian biochemist who won the Nobel Prize in Physiology or Medicine in 1937.)*



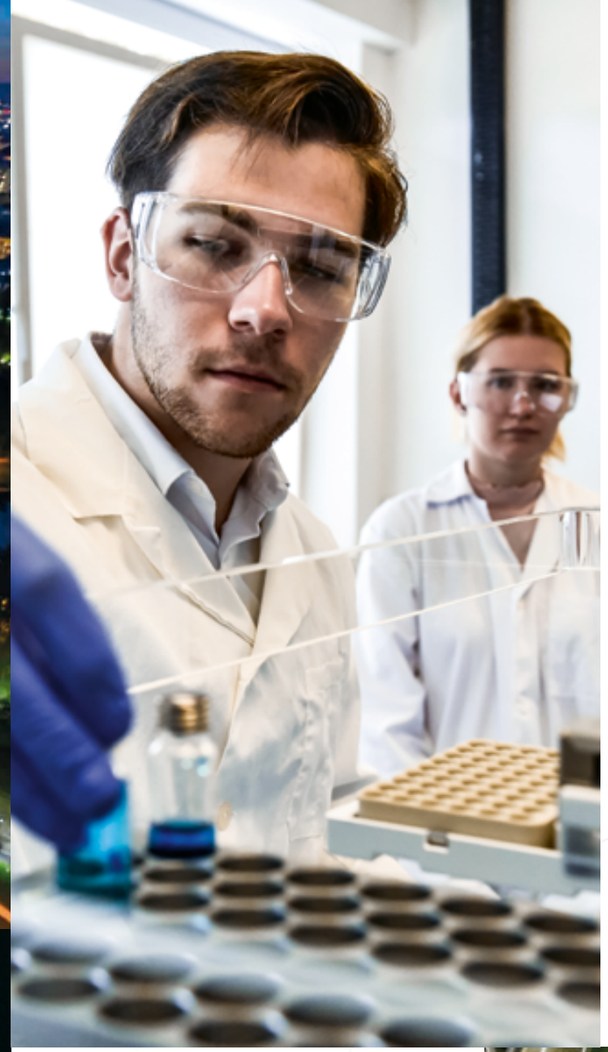






Fundamentals of sustainability

The operation of the whole university is linked to the principles of sustainability in terms of energy use, water use and waste management. UPS has several campuses, all of which have been surveyed to ensure sustainable operation. New buildings have had to meet high energy standards due to the new energy regulations, while the renovation and conservation of old buildings has led to a number of solutions, in particular to promote energy saving, selective waste collection and responsible water use. Active elements in building maintenance engineering e.g., the use of smart grid elements in the electricity network together with passive elements, e.g. insulation and differentiated heating played a major role in the field of energy. The installation of low-flow taps and the possibility of grey water recycling were also implemented in the field of water supply. Social patterns to reduce waste production and selective collection in the field of waste management, and the responsible use of electricity have contributed to transform office and educational habits. The design and implementation phases involved building management professionals and university management, staff and students.



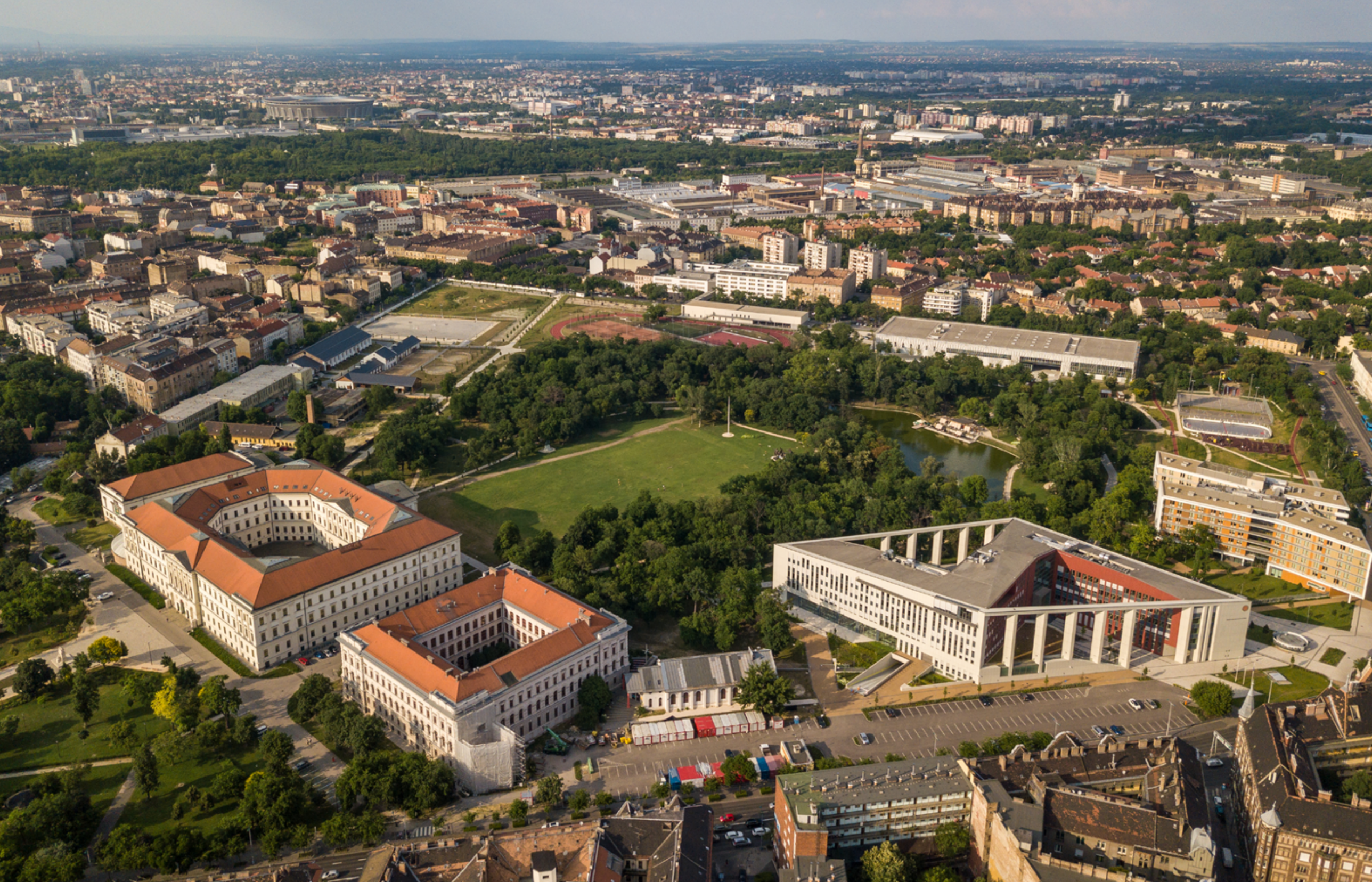
Sustainability in research and education

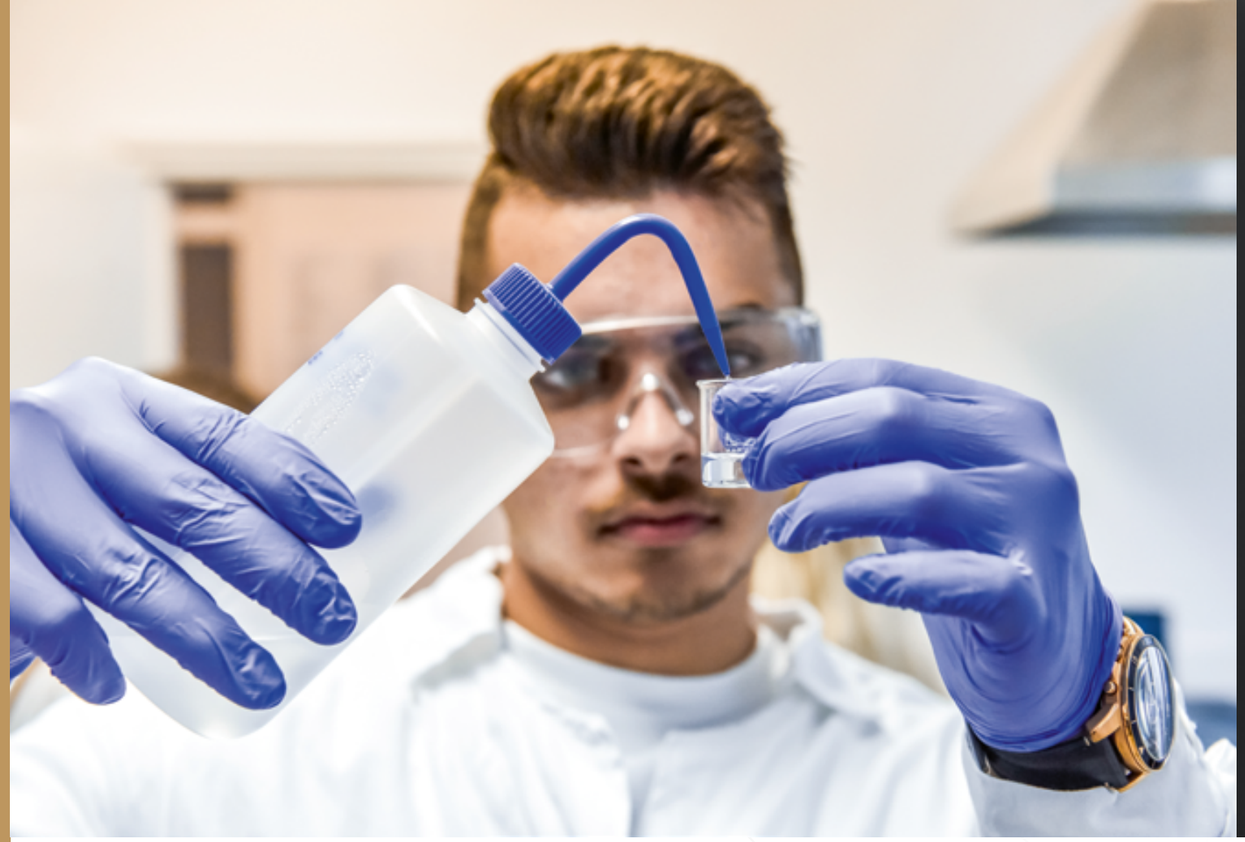
1) Water innovations for a sustainable environment and circular economy

In the midst of the global water crisis, our research at the Faculty of Water Sciences (FWS) of UPS covers the entire water cycle from water acquisition to wastewater treatment and surface water monitoring. Bank filtered aquifers, which provide nearly 40% of drinking water in our country, are vulnerable to climate change and anthropogenic pollutants: changes in the oxygen balance of filtering surfaces, changes in the background/surface water ratio in wells, which can only be avoided by improving treatment methods.

The implementation of digital urban water management is an important element of circular management. This is linked to our research on network hydraulics and coupled water quality models for adaptive water supply. Hydraulic modelling of urban water supply systems allows pressure management according to current needs, determination of water age, monitoring of water quality changes in the water supply system. Today, the development of water engineering works can only be envisaged using numerical flow tools, intelligent process control algorithms, process optimisation based on artificial intelligence. Our models aim to maximize the useful reactor volumes to increase hydraulic efficiency through cost-effective interventions, reactor design and plant upgrade.

One branch of our research is the development and dual use of synthetic photoheterotrophic algal-bacterial biodegradation communities for wastewater treatment and heavy metal biosorption coupled bioenergy production. The photoheterotrophic systems and technology developed in the laboratory were designed in collaboration with our national and Indian technical partners (CSIR-CMERI). State-of-the-art genomic, analytical and imaging methods are being used in the development, e.g. shotgun metagenome sequencing, tracking microbial community dynamics.





2) Research of differentiated flood safety measures for sustainability

One quarter of the territory of Hungary is situated on floodplains and the relative length of flood protection dykes in the country is very high compared to the rest of Europe. In addition, river regulation and flood protection measures contributed to an increase of flood water levels and a decrease of low water levels. Recent flood waves exhibited that water levels have risen but discharges have not, clearly indicating that the flood conveyance capacities of our inundation zones have decreased. As a result of shrinking agriculture and farming as well as extended low-flow periods and riverbed incision, the characteristics of inundation zones have changed much in the past 30 years.

Due to the already detectable effects of the ongoing and forecast climatic changes, water coverage of the floodplain areas is decreasing both in its extent and in its durability. These processes impair water management but harm the sustainability of natural values as well. Flood safety in the coming years can be achieved in a cost-efficient way by a well-planned floodplain management to increase both economic and ecological values of inundation zones (flood management, low-flow management, sediment management, the regulation of flood conveying tracks). It is urgent to develop new water management methods and ecological solutions, therefore the FWS Floodplain Research Group has been set up with the following goals:

I) Substantiation and formulation of interventions to increase the flood conveyance capacities of inundation zones together with ecosystem services.
II) Setting up of an indexing system in order to establish an objective comparison of different river stretches.
III) Scientific planning of high importance water management interventions together with impact assessment and risk analysis in relation to these interventions.

3) Supporting integrated water management with digital technologies

Global climate change, its regional and local impacts, and an increasing frequency of extreme weather events pose fundamental new challenges for water management. The crisis of too much, too few, too polluted water is also threatening Hungary - our health, well-being and security are at stake. The data collection and analysis systems that underpin water management are currently operating in isolation. Missing elements are integrated data collection, database management and decision support at the national level, which would allow more efficient water management supported by a digital tool system. In order to step forward in the direction of an integrated viewpoint, the Floodplain Research Group intends to build a research network with Hungarian and international higher education and research institutions. The main goal is to strengthen of the effectuation of integrated approach in water management related research in Hungary through the joint implementation of the lineaments of technical hydrology, ecology, industry, energy production, agriculture, forestry and game management, traffic as well as recreation. The planned program has the following four specific objectives:

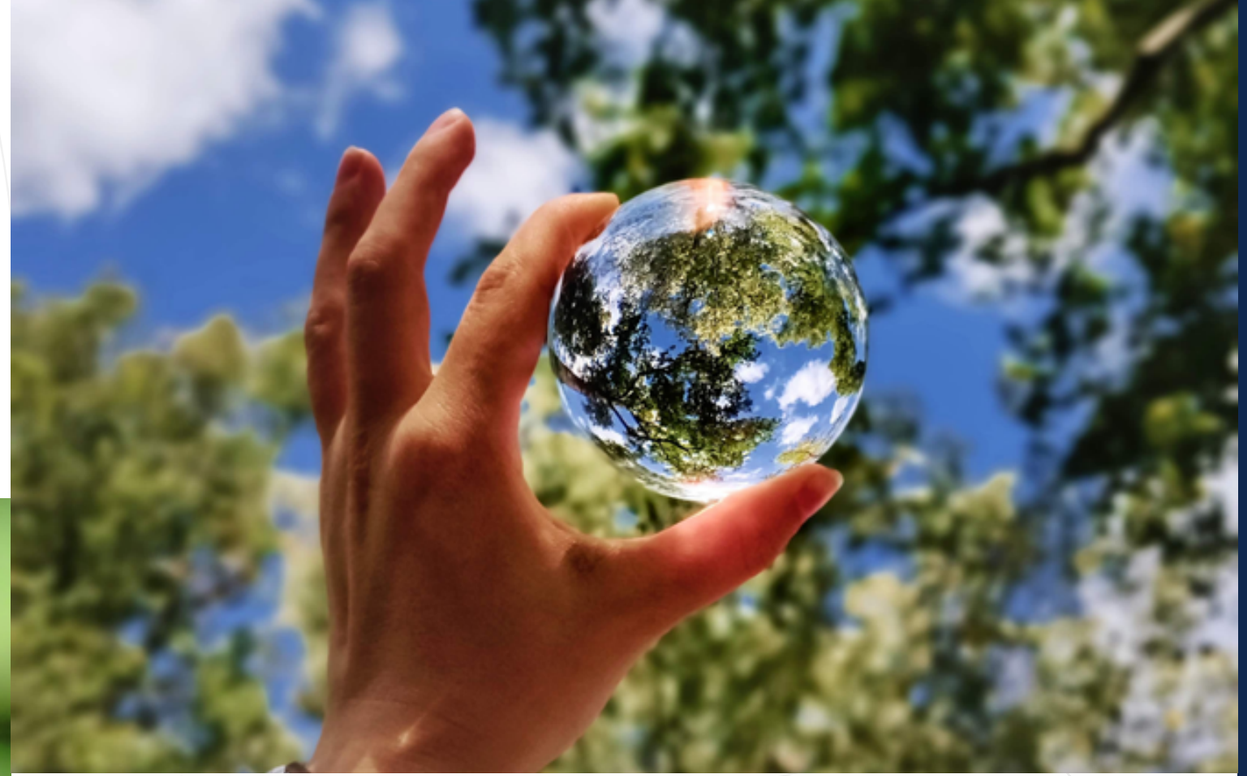
I) Analyze, quantify, map, standardize, and technically integrate complete digital water management databases. Identify and collect missing but key basic data, highlight regional differences.
II) Contribute to the development and implementation of spatially and temporally distributed risk management plans at national, regional and local levels using digital technologies.
III) Develop institutional solutions to regulate and oversee user-side adaptation to legitimate bottlenecks due to changing exploitation needs and conditions, using conflict resolution processes with a wide range of stakeholders at different levels and across different regions.
IV) Support the needs of the sectors, strategic actors and decision-makers, market participants and service providers involved in water management with digital methods, and understand the limitations of water management in their operation.

4) MA in International Water Governance and Water Diplomacy

The Department offers a two year MA programme in International Water Governance and Water Diplomacy since the the academic year 2020/2021. It provides up-to-date, practice-oriented education for practicing and future water managers, diplomats, national and international civil servants engaged in transboundary or global environmental issues. The curriculum comprises the following courses: Introduction to integrated water resources management, Water and the Anthropocene: the sustainability challenges of water management, Introduction to hydrology, Fundamental questions of water governance (institutions, processes, principles), Water economics, Decision-support tools of water management, Environmental conflict management and communication, General questions of water law, International and European water law, Institutions of international water governance, Water in the United Nations systems, Introduction to diplomacy, Military perspectives of natural resources crises, Institutions and procedures of international water conflict management, International water project management.

5) "Ludoviceum" course on Sustainable Development

The service of the common good in the framework of the state organs and institutions has many facets. The graduates of UPS go on to serve in the ranks of the civil service, the foreign office, the armed forces, the police, the institutions of disaster prevention and management, water management, and tax and customs offices. Facing complex problems, time and again they will have to work together in harmony. Neither crises nor development efforts are coming is silos, but they require and benefit from, the systems approach. Our graduates must therefore develop an understanding of the problems their colleagues are facing, and the skills they offer. They also need a common understanding of the main challenges of our times. In order to build this "common language", UPS offers a common module of courses – called „Ludoviceum" - to be accomplished by all students at the beginning of their studies.
Among the main overarching challenges the sustainability of societies – availability and quality of our natural resources, stability of social structures, and the reliability of the economy – is certainly an eminent one. The Faculty of Water Sciences offers, in the framework of the Ludoviceum, the course Sustainable Development, to ensure the „SD literacy" of our students. The course gives an overview of the global megatrends and their environmental and social consequences, and offers up-to-date information of the main institutional and legal instruments aimed at achieving sustainability and building resilience.



6) E-government for sustainability

The Department of Public Management and Information Technology at the Faculty of Public Governance and International Studies supervises the e-government aspects of sustainability at UPS. 23 full-time lecturers and a dozen external experts are dealing with the education and research of public service relations in digital governance, smart cities, data protection, freedom of information, cybersecurity, public information systems, and info-communication technologies in general.

Actually, 8 programs are served with 48 mandatory and 39 elective courses, including 26 Hungarian and 13 foreign language courses. Beyond that, several continuing training programs are managed or served by the department.

Due to the practice-oriented education and research portfolio, the department has become one of the most attractive communities for bachelor, master, and PhD thesis writing.

We are proud to be the first in Hungary to introduce a course and establish learning materials for digital competency development based on DigComp 2.1 requirements. The department participated in developing the Reference Framework for Public Administration which sets the output requirements for developing digital competencies among public servants. We are convinced that this knowledge is essential for building a sustainable public service sector through a resilient workforce.

The broad research portfolio covers digital self-governance, digital support of management, artificial intelligence, smart city development, robotic process automation (RPA), and data protection with a high emphasis in the next period.

Professional relations are supported by annual conferences related to the research topics. Beyond the Central and Eastern European e|Dem and e|Gov Days 2021 international conference, the VII. Municipality Nowadays Conference and the II. Public Administration Day (23rd June 2022) will be organized.

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