R&D competences and educational cooperation opportunities

University of Pannonia Nagykanizsa

University Center for Circular Economy

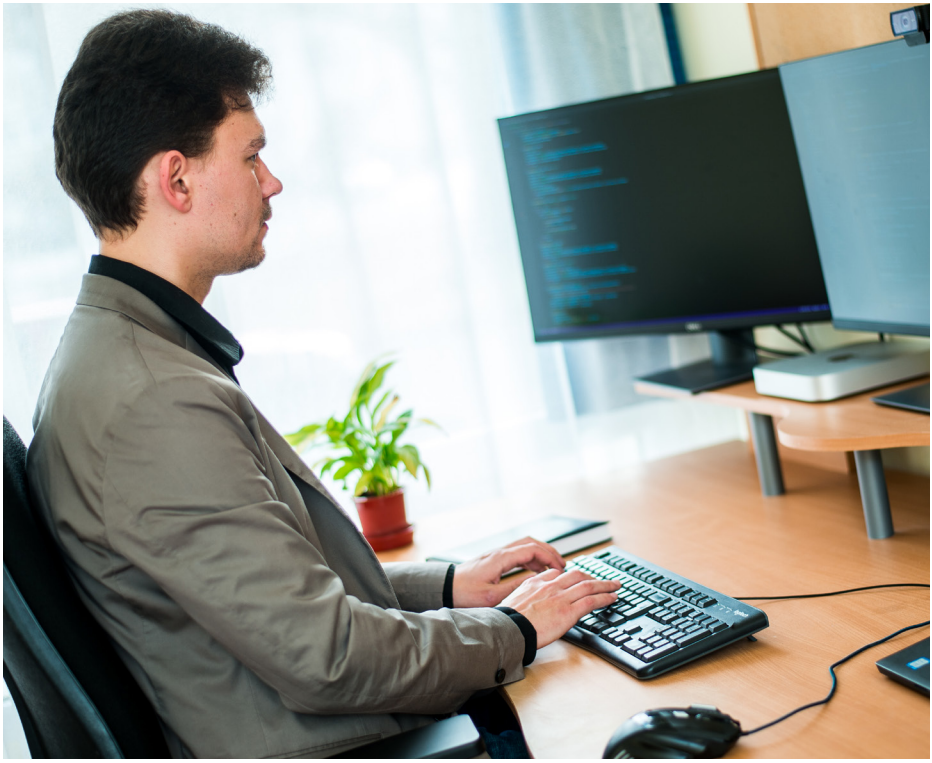
2024

Dear Visitor,

In this brochure you can read about the R&D portfolio of the University of Pannonia - University Center for Circular Economy. There are four different academic and R&D units at the University Center, whose members possess a wide range of scientific knowledge in connection with circular economy.

Please, read the introduction of each unit and the researchers' short descriptions, as well. Should you have any specific questions or suggestions for cooperation, feel free to get in contact with the researchers or write to: international@pen.uni-pannon.hu

We wish we will be able to cooperate in the future.



Contents

Institute of Applied Management Sciences

The institute of Applied Management Sciences carries out education and research under the guidance of the Faculty of Business and Economics of the University of Pannonia with special emphasis on the area of adaptation to the dynamically changing business environment and innovation.

The professional competences of the institutional unit are the following:

- Tourism development, tourism marketing
- Tourism security
- Assessment of the applicability of renewable energy sources at municipal, institutional and company level
- Applications of the circular economy model at company, institutional and municipal level
- Sustainability issues, business responsibility
- Spatial development, urban development, local economic development

Kornél Németh, PhD
associate professor

nemeth.kornel@pen.uni-pannon.hu

Research areas:

His research interests are circular economy, renewable energy sources, complex analysis of the economic, environmental, social, technical and logistical conditions for renewable energy use, and eco-innovation.

- Circular economy
- Renewable energy sources
- Rural development
- Environmental sustainability
- Eco-innovations

Scientific articles:

Lengyel, Péter; Bai, Attila; Gabnai, Zoltán; Mustafa, Othman Mohammad Ahmed; Balogh, Péter; Péter, Erzsébet; Tóth-Kaszás, Nikoletta; Németh, Kornél: Development of the Concept of Circular Supply Chain Management—A Systematic Review, PROCESSES 9 : 10 p. 1740 (2021),

Németh, K; Birkner, Z; Katona, A; Göllény-Kovács, N; Bai, A; Balogh, P; Gabnai, Z; Péter, E: Can energy be a “local product” again? - Hungarian case study, SUSTAINABILITY 12 : 3 Paper: 1118 , 21 p. (2020),

Németh, Kornél; Hegedűsné Baranyai, Nóra; Vincze, András; Tóth-Kaszás, Nikoletta; Péter, Erzsébet: Generational approaches to climate change with special regard to tourism and recreational habits - Results of a Hungarian survey, SOCIETY AND ECONOMY 44 : 1 pp. 83-101. , 19 p. (2022)

Prof. Zoltán Birkner, PhD

professor

birkner.zoltan@pen.uni-pannon.hu

Research areas:

His main research area is the examination and development of innovation capability of companies. He has many decades of experience in the examination of regional cooperations, innovation, and relational and sustainability potentials. He has been the president of the Circular Economy Technological Platform since 2022 and he is the Vice President of the Hungarian Association for Innovation.

- Innovation
- R&D projects
- Management

Scientific articles:

Birkner, Zoltán; Mészáros, Ádám; Szabó, István: Lessons Learnt: Changes in the Methodology of the Entrepreneurial Discovery Process in Defining the Priorities of Hungarian Smart Specialisation Strategies, SUSTAINABILITY 13 : 22 Paper: 12695 , 18 p. (2021),

László, Berényi; Nikolett, Deutsch; Bernadett, Szolnoki; Zoltán, Birkner: Perception of e-Learning Among Hungarian Engineering Students ELECTRONIC JOURNAL OF E-LEARNING 19 : 5 pp. 376-387. , 12 p. (2021),

Berényi, László; Birkner, Zoltán; Deutsch, Nikolett: A Multidimensional Evaluation of Renewable and Nuclear Energy among Higher Education Students SUSTAINABILITY 12 : 4 Paper: 1449 , 22 p

Nikoletta Kaszás, PhD
associate professor

kaszas.nikoletta@pen.uni-pannon.hu

Research areas:

Her research field is primarily sustainable and circular tourism. In addition, among her research topics, she focuses on the issues of project management, with a particular focus on tender projects and sustainable project management.

- Sustainable and circular tourism
- (Sustainable) project management
- Different aspects of digital transformation (in tourism, human aspects etc.)

Scientific articles:

Understanding circularity in tourism

Updating the tourism organizational assessment scale

An unused opportunity or the way of progression? – what does tender project mean and how can we be successful in it?

The emergence of organizational and human factors in digital maturity models

Erzsébet Péter, PhD
associate professor

peter.erzsebet@pen.uni-pannon.hu

Research areas:

Her research interests include circular economy, consumer and corporate behaviour, as well as the complex analysis of tourism and economic, environmental, social and corporate behaviour.

- Business analysis
- Tourism
- Consumer and corporate behaviour

Scientific articles:

Katona, Andrea; Birkner, Zoltán; Péter, Erzsébet: Examining Digital Transformation Trends in Austrian and Hungarian Companies, SUSTAINABILITY 15 : 15 Paper: 11891 (2023)

Péter, E; Németh, K; Katona, A; Göllény-Kovács, N; Lelkóné Tollár, I: How people in Zala County see security in tourism , DETUROPE: THE CENTRAL EUROPEAN JOURNAL OF REGIONAL DEVELOPMENT AND TOURISM 11 : 1 pp. 95-116. , 22 p. (2019)

Németh, K; Birkner, Z; Katona, A; Göllény-Kovács, N; Bai, A ; Balogh, P; Gabnai, Z; Péter, E: Can energy be a “local product” again? - Hungarian case study = Lehet-e újra “helyi termék” az energia? Magyar esettanulmány, SUSTAINABILITY 12 : 3 Paper: 1118 , 21 p. (2020)

Nóra Mezőfi

PhD student, assistant research fellow

mezofi.nora@pen.uni-pannon.hu

Research areas:

The primary area of her research focuses on implementing the circular economy model in enterprises. The business aspects of the European Union's action plans for the circular economy, the opportunites and challenges of the circular business models belong to her research topics.

- Circular economy
- Marketing
- B2B marketing

Scientific articles:

Opportunities and challenges of a circular economy in rural areas. Evaluation analysis of good practices. - Changes in consumer habits in the Circular Economy model in response to the pandemic.

The business aspects of the European Union's action plans for the circular economy.

Péter Balogh
PhD student

iampeterbalogh@gmail.com

Research areas:

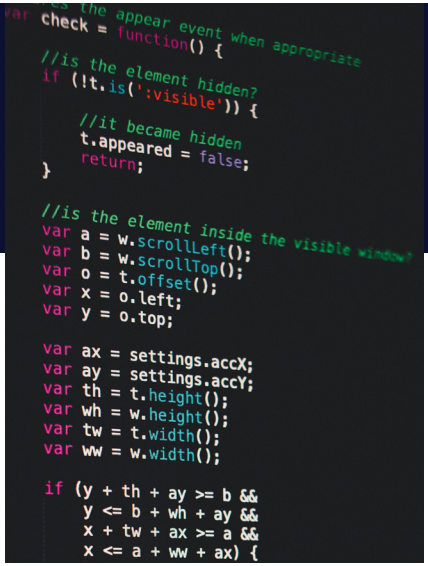
The main focus of his research area is industrial symbiosis, where enterprises cooperate in order to get economic and environmental benefits at the same time. He currently focuses on the levels of possible cooperation (such as eco-industrial parks, urban-industrial symbiosis, regional cooperation) and on the possible methods of initiation (such as bottom-up, top-down).

- Micro and macroeconomics
- International business economics
- Circular economy

Scientific articles:

Balogh Péter: Körforgásos gazdaság Nagykanizsán és környékén– egy felmérés tapasztalatai
(Circular Economy in Nagykanizsa and its surroundings -experience of a survey)

In: Németh, K; Jakab, B; Péter, E VII. TURIZMUS ÉS BIZTONSÁG NEMZETKÖZI TUDOMÁNYOS KONFERENCIA TANULMÁNYKÖTET
Nagykanizsa, Magyarország : Pannon Egyetem (2023) 407 p. pp. 296-304. , 9 p.



Department of Applied Information Technology

The examination of IT problems occurring in the field of Industry 4.0 is in the focus of the researches of the department. It includes among others the introduction and operation of total or partial automatization. To be able to carry out research, a laboratory has been built, which can model industrial processes. A lot of information is born during today's modern industrial processes, whose storage and process implies serious IT challenge. The collected data open new possibilities in the field of the increase of the effectiveness of the systems. It is going to be possible to introduce several optimization, flexibility increasing and intelligent automatization technics. Partner organizations help with solving the non-exclusively IT problems.

Beside the Industry 4.0 activities we have experience and company references in the field of software development. It includes the development of web-based and application-based software systems as well as complex ones requiring more and different development methods.

We provide our partners with the following services:

- Application development
- Development of software systems
- Development of web-based systems
- Design and development of sensor networks
- Big Data, data mining
- Production design
- Optimization
- Definition of automatization level
- Design of potential IT/automatization development strategies
- Production/Process analysis
- Development and introduction of unique IT solutions
- IT support, feasibility studies

Szilárd Jaskó, PhD
associate professor, head of department

jasko.szilard@pen.uni-pannon.hu

Research areas:

His research interests include the sensor -, date collecting networks, adaptive intelligent systems and the industry 4.0, 5.0 are. His current research is in the area of the Human Digital Twins, Operator 4.0 and the water 4.0.

- Sensor -, data collecting networks
- Industry 4.0/5.0
- Operator 4.0
- Water 4.0

Scientific articles:

Róbert Csalódi, Zoltán Süle, Szilárd Jaskó, Tibor Holczinger, János Abonyi, “Industry 4.0-Driven Development of Optimization Algorithms: A Systematic Overview”, Complexity, vol. 2021, Article ID 6621235, 22 pages, (2021). https://doi.org/10.1155/2021/6621235 Impact factor: 2.462

A. K. Eesee, S. Jaskó, G. Eigner, J. Abonyi and T. Ruppert, “Extension of HAAS for the management of cognitive load,” in IEEE Access, doi: 10.1109/ACCESS.2024.3359902., Impact factor: 3.9 (2024)

Tibor Holczinger, PhD

associate professor, deputy director-general

holczinger.tibor@pen.uni-pannon.hu

Research areas:

His research interests include the scheduling of production systems focusing on S-graph framework and the modeling of manufacturing systems in Industry 4.0. His current research is in the area of scheduling systems with uncertainty.

- Operation research
- Scheduling of industrial processes
- Industry 4.0

Scientific articles:

Bakon, Krisztian; Holczinger, Tibor; Sule, Zoltan; Jasko, Szilard; Abonyi, Janos: Scheduling Under Uncertainty for Industry 4.0 and 5.0, IEEE ACCESS 10 pp. 74977-75017., 41 p. (2022)

Hegyháti, Máté; Holczinger, Tibor; Ősz, Olivér: Addressing storage time restrictions in the S-graph scheduling framework, OPTIMIZATION AND ENGINEERING 22:4 pp. 2679-2706., 28 p. (2021)

Krisztián Attila Bakon

PhD student, assistant lecturer

bakon.krisztian@pen.uni-pannon.hu

Research areas:

The focus of his research area is the scheduling of production systems, solving uncertainty scheduling problems with the S-graph framework. Application of maturity model in industrial and tourism areas.

- Scheduling
- Procedural problem resolution
- Software system development
- Management ICT
- Tourism 4.0

Scientific articles:

Bakon, Krisztian; Holczinger, Tibor; Sule, Zoltan; Jasko, Szilard; Abonyi, Janos: Scheduling Under Uncertainty for Industry 4.0 and 5.0, IEEE ACCESS 10 pp. 74977-75017., 41 p. (2022)

Hegyháti Máté, Bakon Krisztián Attila, Holczinger Tibor: Optimization with uncertainties: a scheduling example, Central European Journal of Operations Research (2023)

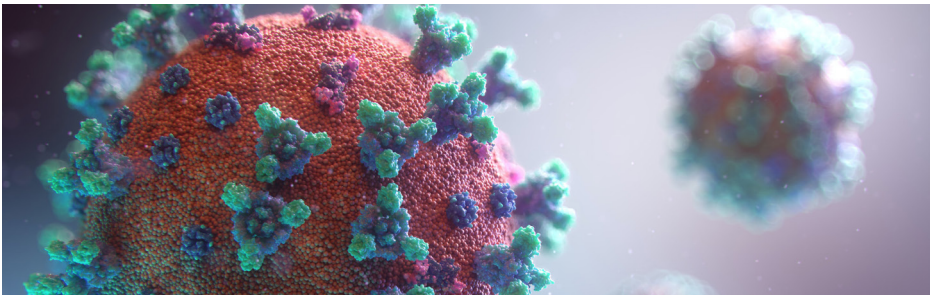
Soós Ernő Research and Development Center, Water Technology Research Group

With the establishment of the Soós Ernő Research and Development Center, a unique knowledge center located in Nagykanizsa has been created working in the field of water purification and water treatment. The work of the Research Center is supported by an international network of industry experts.

The main research areas include:

- water treatment
- industrial water treatment and waste water treatment
- technological and wastewater recycling solutions from oil technologies
- possibilities for recycling wastewater from thermal waters
- qualitative and quantitative determination of micropollutants and microplastics in waters, development of removal technologies
- detection of COVID-19 and other gastroenterological virus hereditary material in wastewater

In case of individual company needs, the Research Center undertakes to hold a lecture or a complex educational program in Hungarian or English, prepared in accordance with the needs of the companies, in connection with water treatment, new technological methods, analytical methods, biological or microbiological issues.



Ildikó Galambos, PhD
head of research center, associate professor

galambos.ildiko@pen.uni-pannon.hu

Research areas:

She gained experience in the purification of surface and subsurface waters using various membrane filtration and membrane material transfer operations, both in laboratory, pilot and industrial scale. She paid particular attention to the removal of arsenic and humic acid, as well as the investigation of the effects of oxidizing agents. Other research area is the removal of organic microcontaminants and microplastic from different water bodies. She also dealt with the further treatment and reuse possibilities of industrial wastewater.

- Water treatment: membrane filtration and membrane material transfer operations.
- Application of membrane technology.
- Life cycle analyzis.

Scientific articles:

Bóna, Á.; Galambos, I.; Nemestóthy N. Progress towards Stable and High-Performance Polyelectrolyte Multilayer Nanofiltration Membranes for Future Wastewater Treatment Applications. Membranes, (2023), 13, 368

Berta, R.; Adamcsik, O.; Galambos, I.; Kovács, N.; Maász, G.; Zrínyi, Z.; Tombácz, E. What are we drinking?- Microplastic problems, current situation. Akadémiai Kiadó – Pannon Egyetemi Kiadó, (2024)

Petrinic Irena, Bukšek Hermina, Galambos Ildikó, Gerencsér-Berta Renáta, Sheldon Marshall S., Helix-Nielsen Claus
Removal of naproxen and diclofenac using an aquaporin hollow fibre forward osmosis module
DESALINATION AND WATER TREATMENT 192 pp. 415-423. , 9 p. (2020)
doi:10.5004/dwt.2020.26082

Etelka Tombácz, PhD, DSc, habil.

research fellow

tombach.etelka@pen.uni-pannon.hu

Research areas:

She is a well-known colloid chemist researching aqueous interfacial equilibria, adsorption, pH and ionic strength dependent surface charging of polyelectrolytes, clay mineral and metal oxide particles, and the colloidal stability of composite systems. Recently, she focuses on the synthesis of magnetic nanoparticles, magnetic fluids and nanocomposites, as well as their environmentally relevant applications, such as magnetic adsorbents for the separation of micropollutants.

- Water treatment: adsorption and dispersion stabilization/destabilization.
- Magnetic nanoparticles, magnetic separation.
- Colloid chemistry.
- Environmental colloids, Interfacial equilibria and colloidal stability in aqueous media,
- Rheology

Scientific articles:

Kovács, N.; Maász, G,; Galambos, I.; Gerencsér-Berta, R.; Mihály, J.; Tombácz, E. Glyphosate/AMPA adsorption on magnetite under different conditions: The effect of pH and electrolytes. Journal of Molecular Liquids, 2024 393, 123674

Socoliuc, V.; Avdeev, MV.; Kuncser, V.; Turcu, R.; Tombácz, E.; Vékás, L. Ferrofluids and bio-ferrofluids: Looking back and stepping forward. Nanoscale, (2022), 14 (13), 4786-4886

Renáta Gerencsér-Berta, PhD
director-general, research fellow

berta.renata@pen.uni-pannon.hu

Research areas:

The main research area includes the qualitative and quantitative determination of micropollutants, the detection of various pharmaceutical preparations and chemical residues in water, the detection and knowledge of microplastic contamination, and the field of GMP document management.

- High performance liquid chromatography (HPLC)
- Elevated temperature liquid chromatography (HT-HPLC)
- High performance liquid chromatography mass spectrometry (HPLC-MS, UPLC-MS / MS)
- Classical analytical methods
- Non - destructive sample preparation procedures for liquid chromatographic studies.

Scientific articles:

Berta, R.; Adamcsik, O.; Galambos, I.; Kovács, N.; Maász, G.; Zrínyi, Z.; Tombácz, E. What are we drinking? - Microplastic problems, current situation. Akadémiai Kiadó – Pannon Egyetemi Kiadó (2024)

Petrinic Irena, Bukšek Hermina, Galambos Ildikó, Gerencsér-Berta Renáta, Sheldon Marshall S., Helix-Nielsen Claus
Removal of naproxen and diclofenac using an aquaporin hollow fibre forward osmosis module
DESALINATION AND WATER TREATMENT 192 pp. 415-423. , 9 p. (2020)
doi:10.5004/dwt.2020.26082

Gábor Maász, PhD, habil.
research fellow

maasz.gabor@pen.uni-pannon.hu

Research areas:

The primary research focus lies in the high-performance analytical examination of organic micropollutants (pharmaceutical residues, pesticides, etc.), determination of their presence, and exploration of possibilities for their removal from various environments.

Till his habilitation in 2020, Gábor Maász has contributed to several impactful researches on the fields of pharmaceuticals in water, efficiency of bank filtration, and the occurrence of pharmaceutically active compounds in environmental water samples. Since 2020, he has been conducting research engaging in environmental analytical surveys in the field of sustainable pharmacy, and providing analytical support for purification technology developments.

Scientific articles:

Maasz, G.; Mayer, M.; Zita, Z.; Molnar, E.; Kuzma, M.; Fodor, I.; Pirger, Zs.; Takács, P. Spatiotemporal variations of pharmacologically active compounds in surface waters of a summer holiday destination. Science of Total Environment (2019), 677:545-555

Maasz, G.; Molnar, E.; Mayer, M., Kuzma, M., Takács, P.; Zrinyi, Z.; Pirger, Zs.; Kiss, T. Illicit drugs as a potential risk to the aquatic environment of a large freshwater lake after a major music festival. Environmental Toxicology and Chemistry (2021), 40(5) 1491–1498

Péter Kesserű, PhD
research fellow

kesseru.peter@pen.uni-pannon.hu

Research areas:

His main research is development of microbiologically supported technologies for industrial processes and for remediation of contaminated soils and water bodies. He also investigates complex biotic-nonbiotic reductive systems for elimination of hazardous inorganic and organic substrates.

- Pesticide residues biodegradation
- Reductive microbiology
- Biopolymer and biofilm production and degradation
- Functional microbiom survey
- Lecture on: Treatment of biowastes and their potentional decomposition, biogas, compost production.
- Treatments of digestates and leachates.

Scientific articles:

Kedves, A.; Sánta, L.; Balázs, M.; Kesserű, P.; Kiss, I.; Rónavári, A.; Kónya Z. Chronic responses of aerobic granules to the presence of graphene oxide in sequencing batch reactors. Journal of Hazardous Materials (2020), 389, 121905 Fritz, P.;

Fritz, R.; Bóday, P.; Bóday, Á.; Bató, E.; Kesserű, P.; Oláh, Cs. Gut microbiome composition: link between sports performance and protein absorption?. Journal of the International Society of Sports Nutrition (2024), 21:1, 24-40

Tamás Kucserka, PhD

research fellow

kucserka.tamas@pen.uni-pannon.hu

Research areas:

- He investigated the water quality of Mura River as a drinking water base (delimitation of the most important pollution sources, environmental state review, sampling plan, examination of 46 types of components, online interactive database, final report).
- He also participated in the development, examination, and simulation of circular model-based water treatment procedures in relation to research on adsorption technologies as well as in the examination of exhausted oil-containing wastewater, designing and executing preliminary experiments for the application of high-efficiency oxidation procedures for the purpose of oxidative experimental testing.

- Water management, wastewater treatment
- Water treatment, Water and wastewater processing laboratory practices
- Treatment of the baths and thermal waters
- Fundamental of Limnology
- Hydrobiology and Limnoecology

Scientific articles:

Kucserka, T.; Németh, G., I.; Pálfi, I., Kiss, Zs., L.; Tombácz, E.; Galambos, I. Adsorption-Based Pretreatment of Irrigation Water to Prevent Water Quality Issues. Separations, 10(9), 468

Borbála Oláhné Horváth, PhD

research fellow

horvath.borbala@pen.uni-pannon.hu

Research areas:

She investigated the spread, current status and decay of COVID-19 disease by analysis of different wastewaters and participated in a project developing an early warning and notification system for spreading of gastroenteritis viruses, using wastewater based epidemiology.

- Biotechnology
- Food biotechnology
- Fermentation

Scientific articles:

Domokos, E.; Sebestyén, V.; Somogyi, V.; Trájer, A., J.; Gerencsér-Berta, R.; Oláhné Horváth, B.; Tóth, E., G.; Jakab, F.; Kemenesi, G.; Abonyi, J.Identification of sampling points for the detection of SARS-CoV-2 in the sewage system. Sustainable Cities and Society (2022), 76, 103422

Zita Zrinyi, PhD
research fellow

zrinyi.zita@pen.uni-pannon.hu

Research areas:

Organic micropollutant detection and quantification in surface and ground water, data collection and following the legal regulation of micropollutants are in the highlight in her work till she returned from maternity leave.

- Ecotoxicology on freshwater model species
- Organic micropollutant detection
- Water chemistry for engeneers
- Quality management

Scientific articles:

Zrinyi Z, Maasz G, Zhang L, Vertes A, Lovas S, Kiss T, Elekes K, Pirger Z. Effect of progesterone and its synthetic analogs on reproduction and embryonic development of a freshwater invertebrate model. Aquatic Toxicology (2017), 190, 94-103

Zhang L, Khattar N, Kemenes I, Kemenes G, Zrinyi Z, Pirger Z, Vertes A. Subcellular Peptide Localization in Single Identified Neurons by Capillary Microsampling Mass Spectrometry. Scientific Reports (2018), 8:12227

Áron Bóna, PhD
research fellow

bona.aron@pen.uni-pannon.hu

Research areas:

Main research field: Polyelectrolyte Multilayer Nanofiltration membrane development, investigation and application.
Cooperation with industrial partners (e.g. MOL) in R&D projects: micropollutant removal for drinking water, produced water treatment, industrial wastewater treatment.
Engineering consultancy reports (about membrane processes, water purification).
Pilot and lab-scale equipment (e.g. membrane testers) development, membrane technology research (RO, NF, UF).

Education activities:
- Basic chemistry, chemical calculations
- Measurement technology and automation in water technology
- Calculations and evaluation of measurement results in water technology

Scientific articles:

Bóna, Á.; Galambos, I.; Nemestóthy N. Progress towards Stable and High-Performance Polyelectrolyte Multilayer Nanofiltration Membranes for Future Wastewater Treatment Applications. Membranes (2023), 13, 368

Bóna, Á.; Varga Á.; Galambos, I.; Nemestóthy, N. Dealcoholization of Unfiltered and Filtered Lager Beer by Hollow Fiber Polyelectrolyte Multilayer Nanofiltration Membranes—The Effect of Ion Rejection. Membranes (2023), 13, 283

Bóna, Á.; Bakonyi, P.; Galambos, I.; Bélafi-Bakó, K.; Nemestóthy Separation of Volatile Fatty Acids from Model Anaerobic Effluents Using Various Membrane Technologies. Membranes (2020), 10, 252

Orsolya Adamcsik

PhD student

adamcsik.orsolya@pen.uni-pannon.hu

Research areas:

She investigated the spread, current status and decay of COVID-19 disease by analysis of different wastewaters and participated in a project developing an early warning and notification system for spreading of gastroenteritis viruses, using wastewater based epidemiology.

- Biotechnology
- Microbiology

Scientific articles:

Adamcsik, O.; Gerencsér-Berta, R.;Oláhné Horváth, B.; Kovács, N.;Somogyi, V.; Domokos E., G.;Kemenesi, G.;Tóth, E., G., Jakab, F.; Galambos, I. A survey of SARS-COV-2 genetic material reduction during traditional wastewater treatment technology. Hungarian Journal of Industry and Chemistry (2021), 50, 7-10

Juan Santiago Hidalgo Viteri

PhD student, assistant researcher

hidalgo.juan@pen.uni-pannon.hu

Research areas:

His main research field is electrochemical studies applied in environmental protection. His main activities are the execution of electrochemical sensors for water monitoring, drug realease studies by Electrochemical Impedances Spectrometry and corrosion protection with green inhibitors. He applied ciclyc voltammetry, square wave voltammetry, and electrochemical impedances to understand the electrochemical phenomena in his research field.

- Preparation of novel electrochemical sensors
- Preparation of green inhibitors

Scientific articles:

Hidalgo, J.; Turdean, G.; Cotolan, N.; Barbu-Tuduran, L. A paracetamol - poly(3,4-ethylenedioxythiophene) composite film for drug release studies. Materials Today Communications. (2020). https://doi.org/10.1016/j.mtcomm.2022.105084

Soós Ernő Research and Development Center, Renewable Energy Research Group

The primary area of research of the Research Group focuses on the renewable sources of energy and energy storage. The group has a wide network of international and Hungarian industry connections, including all the major corporations of the Hungarian electricity sector.

We provide the following services to our industrial partners:

- complex design of systems using/storing renewable energy
- energy storage modelling
- survey of planned solar power plant project sites
- survey of the status PV system modules
- examination of the possibilities of using renewable sources of energy, the selection of the suitable technology
- consultancy on energy system installations, sizes and optimization
- economic calculations, OPEX / CAPEX calculations
- environmental economic analyses
- environmental awareness, CO_2 savings tracking
- comparison of different technologies, preparation of complex case studies, exploratory SWOT analyses

Gábor Pintér, PhD, habil.

research group leader, associate professor

pinter.gabor@pen.uni-pannon.hu

Research areas:

The primary area of his research focuses on renewable sources of energy and energy storage, and he is the leader of numerous international and Hungarian projects related to these fields. The integration of renewable energy sources into the electric energy system, connecting different energy systems as well as the various energy storage technologies belong to his most significant research topics.

- renewable energy (solar PV, biomass etc.)
- renewable energy systems
- integration of renewable energy sources into electric energy systems (scheduling, system regulation)
- energy storage (battery energy storage, thermal energy storage, hydrogen, power-to-X etc.)

Scientific articles:

Zsiborács, H.; Baranyai, N.H.; Vincze, A.; Zentkó, L.; Birkner, Z.; Máté, K.; Pintér, G. Intermittent Renewable Energy Sources: The Role of Energy Storage in the European Power System of 2040. Electronics 2019, 8, 729.

Pintér, Gábor The development of global power-to-methane potentials between 2000 and 2020: A comparative overview of international projects, APPLIED ENERGY 353 Paper: 122094 , 15 p. (2024)

Nóra Hegedűsné Baranyai, PhD, habil.

associate professor

baranyai.nora@pen.uni-pannon.hu

Research areas:

The analysis of social and economic processes lies in the focus of her professional interest. Her most important fields of research include certain segments of tourism, economic time series, territorial development, sustainable agriculture, and renewable energy sources, however her most recent research concentrates on renewable sources of energy, energy storage and energy systems.

- Renewable energy (solar PV, biomass etc.)
- Renewable energy systems
- Statistics and regional analysis
- Social and economic processes related to the spread of the deployment of renewable energy

Scientific articles:

Zsiboracs, H.; Zentko, L.; Pinter, G.; Vincze, A.; Baranyai, N.H. Assessing shading losses of photovoltaic power plants based on string data. Energy Rep. (2021), 7, 3400–3409.

Hegedűsné Baranyai Nóra, Zsiborács Henrik, Vincze András, Rodek Nóra, Makai Martina, Pintér Gábor Correlation Analysis of the Spread of Household-Sized Photovoltaic Power Plants and Various District Indicators: A Case Study, Sustainability 13 : 2 Paper: 482 , 24 p. (2021)

András Vincze, PhD
research fellow

vincze.andras@pen.uni-pannon.hu

Research areas:

His main research areas include the deployment of renewable energy sources, the current issues of renewable energy systems and energy storage as well as the relationships of tourism and communication.

- Renewable energy (solar PV, biomass etc.)
- Renewable energy policies and strategies
- Social and economic aspects of the spread of the deployment of renewable energy
- Communication, international communication (business communication, communication of policies, international tourism etc.)

Scientific articles:

Zsiborács, H.; Baranyai, N.H.; Vincze, A.; Zentkó, L.; Birkner, Z.; Máté, K.; Pintér, G. Intermittent Renewable Energy Sources: The Role of Energy Storage in the European Power System of 2040. Electronics (2019), 8, 729

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Research areas:

Photovoltaic technology and the technical and economic modelling of energy storage facilities are in the center of his professional interest, in which field he has created several patents and prototypes with his colleagues. His most significant research areas include the forecasting of photovoltaic energy generation, energy strategy and policy, the concept of smart networks and energy storage technologies.

- Renewable energy and the modelling of renewable energy systems
- Integration of renewable energy sources into electric energy systems (scheduling, system regulation)
- Energy storage (battery energy storage, thermal energy storage, hydrogen, power-to-X etc.)

Scientific articles:

Zsiborács, H.; Baranyai, N.H.; Vincze, A.; Zentkó, L.; Birkner, Z.; Máté, K.; Pintér, G. Intermittent Renewable Energy Sources: The Role of Energy Storage in the European Power System of 2040. Electronics (2019), 8, 729.

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