



prof. Ing. Vieroslav Molnár, PhD.

Professor · researcher · university teacher

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PROFESSIONAL PROFILE

Inaugurated in Logistics and currently serving as a professor in Manufacturing Technologies. His career combines scientific research and university teaching with the design, analysis, modelling, simulation and experimental validation of technical systems. His research focuses on conveying and logistics systems, belt and pipe-conveyor diagnostics, contact-force and belt-tension measurement, digital twins and digital transformation. He is an author and co-author of scientific publications, patents and utility models and has served as principal investigator or member of research teams in national and international projects.

RESEARCH FOCUS

01	02	03
Conveying systems and conveyor belts Contact forces, belt tension and operational diagnostics	Pipe conveyors, mistracking and failure states Experimental measurement, statistical evaluation, modelling and simulation	Digital twins, digital transformation and smart manufacturing systems Production logistics and computer-aided manufacturing technologies

ACADEMIC CAREER

2018 – present	Professor	Faculty of Manufacturing Technologies, TUKE, Prešov
2005 – 2018	Associate Professor	Institute of Industrial Logistics and Transport, TUKE, Faculty BERG
2001 – 2005	Assistant Professor	Department of Logistics and Production Systems, TUKE, Faculty BERG
1995 – 2001	Private sector	KDK, s.r.o.; AAA Netings a.s.; Victor Business Data, s.r.o.
1987 – 1995	Assistant Professor	Department of Measurement and Regulation, Faculty of Mechanical Engineering, TUKE
1985 – 1987	Assistant	Department of Instrumentation and Automation Technology, Prešov branch

EDUCATION AND ACADEMIC DEGREES

2015	Professor (Prof.)	Inauguration in Logistics, TUKE, Faculty BERG
2005	Associate Professor (Doc.)	Habilitation in Mining Machinery, Transport and Deep Drilling, TUKE
1995	CSc.	Mechanical Engineering Technology, Faculty of Mechanical Engineering, TUKE
1980 – 1985	Ing.	Instrumentation, Regulation and Handling Technology, Prešov branch

INTERNATIONAL RESEARCH AND VISITING APPOINTMENTS

2023-2026	Institute of Technology and Business in České Budějovice, Czech Republic
2023-2026	College of Logistics, Přerov, Czech Republic
2023-2026	University of Pardubice, Faculty of Transport Engineering, Czech Republic
2017-2026	Lublin University of Technology, Faculty of Mechanical Engineering, Poland
2016-2024	University of Rijeka, Faculty of Maritime Studies, Croatia
2016	University of Zagreb, Faculty of Transport and Traffic Sciences, Croatia
2016	University of Novi Sad, Faculty of Technical Sciences, Serbia
2014	ContiTech Conveyor Belt Group, Germany

SELECTED SCIENTIFIC PUBLICATIONS

2026 · IEEE Access

Blockchain-Based Decentralized Data Management Architecture for the Development of a Mechanical Model and Sensor-Driven Monitoring of Pipe Conveyor Systems

14, 49690–49703 · DOI: 10.1109/ACCESS.2026.3678410

2026 · Engineering Failure Analysis

Use of blockchain technology within the failure analysis of conveyor belts for pipe conveyors

193, 110892 · DOI: 10.1016/j.engfailanal.2026.110892

2026 · Engineering Failure Analysis

Failure analysis and causes of uneven material distribution on the conveyor belt

183, 110206 · DOI: 10.1016/j.engfailanal.2025.110206

2025 · Measurement

Measurement of the bulk material distribution length on a conveyor belt surface guided on a three-roller idler housing

253(D), 117849 · DOI: 10.1016/j.measurement.2025.117849

2024 · Journal of Industrial Textiles

Additive technologies use to create structures for technical fabric replacement

54 · DOI: 10.1177/15280837241245121

2024 · Sensors

Design of Evaluation Classification Algorithm for Identifying Conveyor Belt Mistracking in a Continuous Transport System's Digital Twin

24(12), 3810 · DOI: 10.3390/s24123810

2024 · Polymers

Surface Evaluation of Gyroid Structures for Manufacturing Rubber-Textile Conveyor Belt Carcasses Using Micro-CT

16(1), 48 · DOI: 10.3390/polym16010048

2023 · Applied Sciences

Identification of Selected Failures in a Pipe Conveyor's Operation with the Use of the Discrimination Method Based on Continuous Measurement

13(12), 6864 · DOI: 10.3390/app13126864

2015 · Measurement

Influence of tension force asymmetry on distribution of contact forces among the conveyor belt and idler rolls in pipe conveyor during transport of particulate solids

63, 120–127 · DOI: 10.1016/j.measurement.2014.12.014

2014 · Measurement

Analysis of asymmetrical effect of tension forces in conveyor belt on the idler roll contact forces in the idler housing

52, 22–32 · DOI: 10.1016/j.measurement.2014.02.035

PATENTS AND UTILITY MODELS

SK 289387 · 2025 · Device for online remote inspection of a conveyor belt for digital transformation

inventor

SK 288408 · 2016 · Device for analysis of rubber-textile conveyor belt samples on industrial computed tomographs

co-inventor

SK 288304 · 2015 · Test device for measuring biaxial tension of rubber-textile conveyor belts

co-inventor

PUV 264-2025 · 2026 · Modular spacer reinforcement of a static test device

inventor

PUV 263-2025 · 2026 · Mechanism for asymmetric tensioning of a pipe-conveyor belt in a static test device

co-inventor

PUV 261-2025 · 2026 · Conveyor-belt clamping design for measuring devices of pipe conveyors for digital transformation

co-inventor

PROJECTS AND RESEARCH FUNDING

APVV-21-0195 · Research into the possibilities of digital transformation of continuous conveying systems

co-investigator · completed

VEGA 1/0674/24 · Research on continuous conveying systems to increase efficiency and effectiveness of automated logistics in line with Industry 4.0

deputy principal investigator · ongoing

VEGA 1/101/22 · Research and development of smart solutions for control of technological processes using experimental methods and computer simulation

principal investigator · completed

VEGA 1/0600/20 · Design of a digital twin for research into selected operating indicators of pipe conveyors using experimental measurements and simulation

deputy principal investigator · completed

VEGA 1/0403/18 · Research and development of modern means of technological-process control using experimental and computer methods

principal investigator · completed

VEGA 1/0922/14 · Study of input-parameter relationships affecting the efficiency of inter-operation transport using mathematical models
principal investigator · completed

VEGA 1/0922/12 · Research into the influence of material characteristics and technological parameters of conveyor belts on contact forces and motion resistance of pipe conveyors
deputy principal investigator · completed

VEGA 1/0036/12 · Development of methods and new approaches to designing input, inter-operation and output warehouses
deputy principal investigator · completed

VEGA 1/0095/10 · Research into conditions affecting degradation and service life reduction of structural parts of pipe conveyors
deputy principal investigator · completed

VEGA 1/0864/10 · Design of an integrated mineral-material transport system controlled by an information system with green logistics
deputy principal investigator · completed

VEGA 1/3307/06 · Design, development and implementation of ecological raw-material transport modules using Pro/Engineer and Catia
deputy principal investigator · completed

VEGA 1/11294/04 · Optimisation of technical and economic parameters of structural elements of conveying machinery and equipment
deputy principal investigator · completed

KEGA 018TUK-4/2022 · Creation of new study materials including an interactive multimedia university textbook for computer-aided engineering
project leader · completed

KEGA 013TUK-4/2019 · Modern educational tools and methods for developing creativity and practical skills of technical graduates
project leader · completed

KEGA 009STU-4/2025 · Development of modern teaching methods for technical subjects – multimedia textbook
principal investigator of collaborating unit · ongoing

KEGA 005TUK-4/2022 · Increasing higher-education efficiency through professional simulators for on-site, distance and dual education
principal investigator of collaborating unit · completed

KEGA 006STU-4/2015 · Interactive multimedia university textbook on means of automated production
principal investigator of collaborating unit · completed

KEGA 001TUK-4/2025 · Support for education and new didactic approaches in digital higher education
deputy project leader · ongoing

KEGA 012TUK-4/2019 · Supporting logistics education in line with Industry 4.0 using a virtual simulation laboratory
deputy project leader · completed

KEGA 018TUK-4/2016 · Virtual laboratory for teaching computer simulation and distributed/parallel finite-element computations
deputy project leader · completed

ACADEMIC SERVICE, PEER REVIEW AND MEMBERSHIPS

- Member of the Scientific Council of the Faculty of Manufacturing Technologies, TU Košice.
- Member of the Scientific Council of the Faculty of Logistics and Crisis Management, Tomas Bata University in Zlín.
- Member of the scientific committee of Logi Scientific Journal on Transport and Logistics.
- Member of state-examination committees in Manufacturing Technologies, Industrial Logistics and Raw-Material Transport Management.
- Member, secretary, expert guarantor, vice-chair and chair of organisational, programme and scientific committees of international conferences and symposia.

Peer reviewer for: Measurement, Advances in Mechanical Engineering, 3D Research, IET Science, Measurement & Technology, Sensors, Metals, IEEE Access, Journal of Sustainable Mining, Mechanical Sciences, Advances in Science and Technology Research Journal, Open Engineering, Transport & Logistics.

TEACHING AND STUDENT SUPERVISION

CAX and modelling

Parametric modelling of parts and assemblies, assembly constraints and configurations, technical documentation; Siemens NX and PTC Creo.

Manufacturing systems

Modelling of material and information flows, manufacturing-system design, process simulation, digital twins and Industry 4.0/5.0.

Conveying systems

Design and operation of belt and pipe conveyors, measurement of forces and operating variables, fault diagnostics and experimental validation.

Student supervision

Bachelor's, Master's and doctoral theses in manufacturing technologies, industrial logistics, modelling, simulation and diagnostics of continuous conveying systems.

LANGUAGES

Russian · English

ACADEMIC PROFILES AND CONTACT

ORCID · <https://orcid.org/0000-0003-4182-4033>

Google Scholar · <https://scholar.google.com/citations?user=3aL5CrwAAAAJ&hl=en>

Scopus · <https://www.scopus.com/authid/detail.uri?authorId=35520084100>

Web of Science · <https://www.webofscience.com/wos/author/record/J-4278-2012>

LinkedIn · <https://sk.linkedin.com/in/vieroslav.moln%C3%A1r-7801aa93>

FVT TUKE · <https://www.fvt.tuke.sk/>

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