



Top-level results in research and science, excellence in teaching and interdisciplinary collaboration have stood for the Technical University of Liberec since 1953. More than 7200 students study at six faculties and one specialized institute. In the field of technology transfer, the Technical University of Liberec has a tradition of research in close cooperation especially with the textile and automotive industries. This has guaranteed excellent placements to graduates. Furthermore, the University is involved in more than 100 research projects worth almost USD 3 million and in contract research. While connected globally, the University understands its responsibility as an institution uniquely located in Central Europe and engages in cross-border projects.

The Institute for Nanomaterials, Advanced Technology and Innovation (CxI) is the most ambitious and expensive project in the nearly sixty-year history of the Technical University of Liberec. It is a new research centre that was established in 2009. The Institute focuses on two research programs: material research and competitive engineering. In addition to the processing and use of new advanced materials (in particular nanomaterials), the Institute focuses on the development and use of advanced engineering constructions and technology (especially mechatronic systems, propulsion units, etc.). One of its priorities is the application of the results of research and their applicability in practice. Basic research in this research programme is focused on a complete physical description of the processes that take place in the electrospinning of polymer solutions and melts. The development (technological) part specializes in new process variants and their modifications. The basic research activities will be: electrospinning, preparation of various types of nanosurface treatments and

preparation of composites based on nanomaterials. Applied research of nanomaterials is focused on exploring the properties of nanomaterials and their utilization for specific applications, such as the development of specific products, especially filters, surface treatments in medicine and engineering, and biotechnology materials for water treatment and other sanitation procedures.

The concept of the research programme Material research

The theme of nanomaterials is designed into a set of five activities in the direction of basic research - applied research - implementation.

(1) Basic research includes the study of the physical processes associated with the formation of nanomaterials and a description of the physical principles of electrospinning. Given the relative newness of the field many of the physical processes are yet to be described in detail. Knowledge of their physical nature, important variables and their influence is necessary to control preparation processes and the properties of the prepared materials. Knowledge of the physical laws of the processes is obtained through the construction of electrohydrodynamic models and comparing them with experimental results. Polymer physics instruments are used to describe the electrospinning process. The theoretical basis of a physical description of the phenomenon of electrospinning is self-organization based on the mechanism of fast-growing instability. This mechanism is subject to experimental study of nanofibres and its parameters. The aim of this part is a complete description of the physical processes that take place in electrospinning of polymer solutions and melts as a basis for informed development of technologies and their control.

(2) In the development (technological) section are developed technologies for the preparation of nanosurfaces and nanofibres as well as their variants. Nanofibres are created from various types of organic and inorganic polymers in the

form of solutions and melts. It is necessary to study the molecular weight of the polymers and their distribution, electrical conductivity and the surface tension of solutions, interaction of macromolecules and solvents, rheological properties and other parameters in relation to the course and performance of the electrospinning and qualitative characteristics of products. In the area of nanosurfaces are studied processes of their formation from diamond, carbon, metals and other materials depending on the methodology of their preparation and process parameters. The output of this part will be new process variants and their modifications.

(3) Based on the results of the first two parts of the R&D process, prototypes and laboratory functional models of machinery will be constructed and materials for the construction of operating lines or their components will be created. The construction includes the choice of materials, actuators and control devices suitable for environments with high electrical potential and an explosive or chemically aggressive environment. An example of the modification of basic technologies for the production of the developed flat nanofibrous formations is part of the production line for linear and three-dimensional nanofibrous formations. For the most part, the project involves the participation of workers from the research programme Competitive Engineering

(4) Applied research of the geometric, surface, physical and chemical properties of nanomaterials is a necessary basis for their use in practice. Particular emphasis in the research will be placed on the study of nanowires and nanoparticles based on metals and their oxides.

(5) Application of nanomaterials is being developed in the following directions: nanofibres for filtration of gases and liquids, sound-absorbing materials, covers for wounds and other medical materials. In addition, materials for remedial processes, tissue engineering and composites or nanosurfaces and nanofibre materials for implants and tissue engineering.

Another direction is the development of nanoparticles for treatment of wastewater or functional nanosurfaces for photocatalytic purification and sterilization.

Research and development is focused on the areas of manufacturing and automotive industries with good application potential and requires regular communication with the business community to identify the needs of businesses in the given industrial field. Priority is given to the question of safety of engineering structures and last but not least, research and development of propulsion units for machines and vehicles. The research programme Competitive engineering is focused on the following areas of R&D:

- sophisticated structures of production machines and robots with mechatronic systems
- new propulsion units of machinery and vehicles
- development and optimization of safe engineering structures
- advanced technologies for the processing of technical materials

The outputs of this activity are planned based on the needs of the application sphere and the existing partnerships with industry. Today they are mainly focused on the areas of mechatronics, robotics, control and use of artificial intelligence, occupational safety and operation of machines and equipment, increasing the life of machinery and equipment, new production processes and technologies, new propulsion systems and units for mobile and stationary equipment etc. Synergy with the research programme Material research, which will also be realized in the framework of the project, can be seen in the application of new nanotechnology to areas of production and processing of materials.

Arthur Lugmayr, Cinzia Dal Zotto (ed.): Media Convergence Handbook – Vol.1 (journalism, Broadcasting, and Social Media Aspects of Convergence), Springer, 2016., Berlin Heidelberg, 429. str.

Media Convergence Handbook u izdanju renomirane znanstvene izdavačke kuće Springer, vrijedno je djelo čiji su urednici ugledni znanstvenici Arthur Lugymar i Cinzia Dal Zotto. Ova urednička zbirka radova, koristeći multidisciplinarni pristup temi medijske konvergencije, istražuje više znanstvenih aspekata toga pojma: strateški, tehnološki, pristup korisnika, te primjenu konvergencije u suvremenim digitalnim aplikacijama. Svi ovi aspekti konvergencije su međusobno povezani, te knjiga daje novi, suvremeni pogled na kompleksni sustav medijske konvergencije.

Volumen se sastoji od četiri tematska dijela: (1) Medijska konvergencija – Uvodne perspektive, (2) Izazovi konvergencije u novinarstvu i izdavaštvu, (3) Konvergencija i elektronički mediji i (4) Konvergencija u kontekstu društvenih medija koji su sačinjeni od ukupno 19 tematskih poglavlja različitih autora.

Prva tematska cjelina usmjerena je na definiranje konvergencije – naglašava se da je konvergencija prošla svoju prvu, početnu fazu u kojoj je pojam označavao isključivo približavanje nekad međusobno različitih tehnologija sa svojim specifičnim razvojnim putevima, te je krenula u novu fazu u kojoj veliki utjecaj na daljnji tijek procesa imaju društvene mreže i njihovi korisnici. Time je proces konvergencije zapravo dobio i dodatnu komponentu, a to je divergencija. Povezivanje i približavanje tehnologija je dovelo do tehnološkog razvoja, koji je pak omogućio individualizirani pristup korisniku, što opet vodi do razdvajanja razvojnih puteva (iako i dalje međusobno povezanih) – elementi sustava (software, hardware, sadržaj i interakcija korisnika) tako istodobno sadržavaju i konvergentne i divergentne procese. Druga tematska cjelina se bavi specifičnim medijskim područjima i konvergencijom: izdavaštvom, elektroničkim medijima i društvenim medijima. Posebno se propituje utjecaj novih, digitalnih medija na kvalitetu novinarstva, te utjecaj novih tehnologija i konvergencije na

medijski sadržaj (kvalitetu, brzinu, pouzdanost i vjerodostojnost).

Treća se cjelina bavi elektoničkim medijima, kao području u kojem je medijska konvergencija zapravo najizraženija. Autori izučavaju pitanje autorskih prava i zaštite intelektualnog vlasništva, tehnološku konvergenciju koja je omogućila konzumiranje televizijskih sadržaja putem mobilnih uređaja, razvoj televizije kroz dvadeseto i dvadeset i prvo stoljeće, te promjene koje je konvergencija donijela u organizaciju novinske redakcije.

Četvrta se cjelina bavi aspektom društvenih medija i konvergencije. Poseban se naglasak stavlja na promijenjenu ulogu korisnika medija, kojemu je konvergencija omogućila da ne bude samo konzument medijskog sadržaja, već i njegov kreator. Takva aktivna uloga korisnika medija obogaćuje medijski prostor, pridonosi demokratizaciji društva i bogatstvu javne riječi, ali i donosi mnoge rizike koji se tiču gotovo neograničene količine informacija koje ulaze u medijski prostor, njihove društvene relevantnosti, problem verifikacije izvora medijske informacije, te nedostatka bilo kakve selektivnosti u objavi sadržaja.

Ova knjiga pruža praktičarima i istraživačima, stručnjacima i laicima vrijedan pregled najvažnijih područja istraživanja medijske konvergencije. Priručnik je vrijedan doprinos raspravi o uzrocima i posljedicama medijskog evolucijskog procesa. Također, važno je naglasiti da se ne daje samo puki pregled postojećih trendova i istraživanja, već se i aktivno upozorava na probleme u istraživanju ove tematike. Knjigu možemo preporučiti kao vrijedan edukativni materijal u području medijske konvergencije.

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