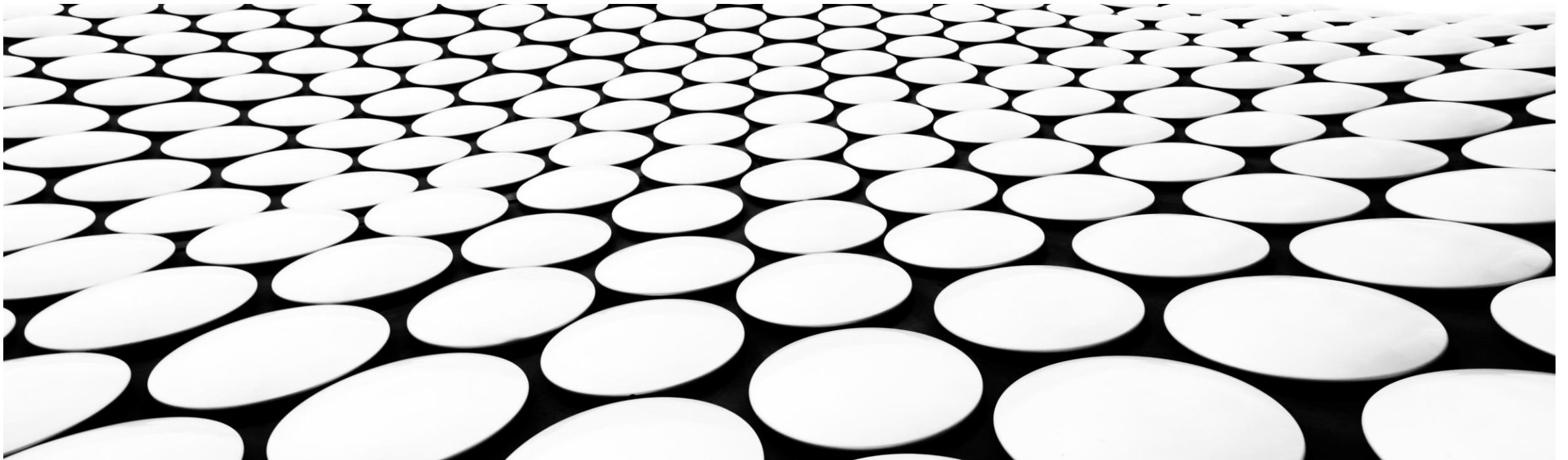

ROBOTIZÁCIA A AUTOMATIZÁCIA OPERAČNÝCH SÁL

PROF. ING. FRANTIŠEK DUCHOŇ, PHD.

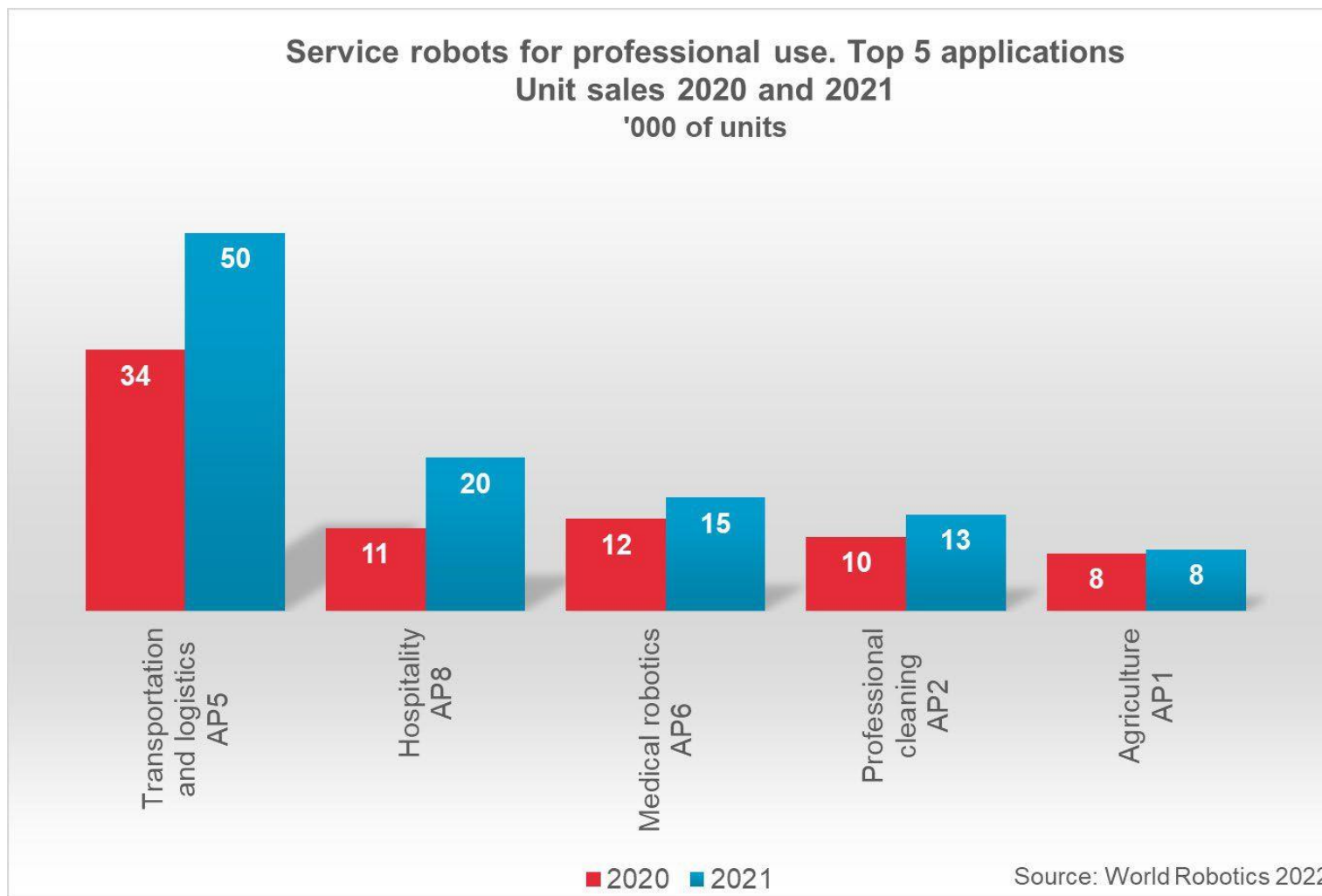
23.11.2023



AKO DELÍME ROBOTIKU

- Priemyselná robotika
 - robotické ramená pevne pripevnené k zemi, stropu a pod.
 - ľahko riadime ich polohu
- Servisná robotika
 - poskytuje služby
 - často mobilná (s robotickým ramenom)
 - náročné a nespoľahlivé riadenie polohy

TOP SEGMENTY SERVISNEJ ROBOTIKY



APLIKÁCIE

The RAVEN-II™ system is sold as a rapid prototyping environment for advances in surgical robotics. Its software is open source (Robot Operating System, ROS), facilitating development and collaboration between user sites. The Surgical Cockpit™ is an ergonomic control station providing 3D visualization and six degrees of haptic enabled positioning per hand along with haptic grasping and radial slide sensors for three fingers. Image credit: Applied Dexterity Inc., USA.



APLIKÁCIE

Versius is a Surgical Robot System particularly developed for laparoscopy. Its design has been guided by the needs of patients, surgeons and surgical teams and shall easily fit into existing surgical workflows. In addition, the console allows surgeons to work in a way that has the potential to reduce physical and mental effort. Image credit: CMR Surgical. Image credit: CMR Surgical.



In the future, the KUKA LBR Med lightweight robot will take on an increasing number of assistance tasks in the field of medicine. Thanks to its sensitivity and safety technologies, it is able to safely assist medical specialists. The LBR Med is the world's first robot that has been certified according to the IEC 60601-1 CB Scheme. Since the certification procedure is internationally recognized, the complexity of the licensing process for medical products based on the LBR Med is substantially reduced. Image credit: Kuka.



APLIKÁCIE

Discovery IGS 730 is a robotics 3D imaging system for minimally invasive surgery co-designed by GE Healthcare and BA Systèmes. This angiography system brings both extremely high-quality imaging and complete workspace freedom to the hybrid operating room. Image credit: BA Systèmes.



The Sensei X Robotic System consists of three main components: physician workstation, robotic catheter manipulator and electronics rack. Sensei translates the physician's hand motions at the remote workstation to a robotically steered guide catheter. Image credit: Hansen Medical, USA.



APLIKÁCIE

Stryker's Mako System can be used across the joint replacement service line to perform total knee, total hip and partial knee replacements. This highly advanced robotic arm assisted surgery system transforms the way joint replacement surgery is performed, enabling surgeons to have predictable surgical experience with accuracy. Image credit: Stryker.



The Flex[®] Robotic System is a robotic surgical platform with a steerable and shapeable robotic scope. The Flex Robotic System offers surgeons the ability to navigate complex anatomy through a single, small entry point while operating in hard-to-reach anatomical locations that might otherwise be inaccessible with straight, rigid surgical tools. Image credit: Medrobotics.



APLIKÁCIE

Mazor Robotics Guidance Systems enable surgeons to conduct spine and brain procedures in an accurate and secure manner. It starts with the creation of a 3D planned surgical plan. Precision mechanics and the surgical arm that guides tools and implants them correctly enable best results. The whole process benefits from intra-operative verification. Image credit: Mazor Robotics.



The groundbreaking Andrew+ design benefits from six years of user feedback on the award-winning Andrew Pipetting Robot. Andrew+ offers fully automated pipetting, as well as more complex manipulations, using a wide range of Domino Accessories and Andrew Alliance electronic pipettes. It executes OneLab protocols, enabling rapid transition from laborious manual procedures to error-free, robotic workflows. Image credit: Andrew Alliance.



APLIKÁCIE

The Delivery Robot for Hospitals (HOSPI) couriers critical medicine and samples safely in medical facilities allowing nurses and hospital staff to focus more attention on bedside support for patients. Image credit: Panasonic, Japan.



It comes when called, bringing care utensils with it and recording how they are used: In a research project, Fraunhofer IPA developed the prototype of an intelligent care cart that provides care staff with physical and informational support. Image credit: Fraunhofer IPA.



APLIKÁCIE

Armeo®Power of Hocoma is the world's first commercially available robotic arm exoskeleton for neurorehabilitation. Image credit: Hocoma, Switzerland.



GaitTronics Inc. is a robotics company developing physical therapy technologies that help patients recover more quickly. Their first product, SoloWalk, actively supports and protects patients while they walk. Image credit: GaitTronics Inc.



APLIKÁCIE

The AlterG Bionic Leg is a rehabilitation tool that helps patients progress through their recovery faster and achieve greater function, mobility, stability, and confidence. By using advanced robotic technology, Bionic Leg helps to maximize motion learning potential and supports the principles of neuroplasticity. Image credit: AlterG, USA.



Robo-K is a mobile device for gait training. It is the result of a 3-year collaborative research project and is specially designed for patients who suffer from walking disability with a neurological origin. Innovative by its technical object, Robo-K project is also innovative by its method, which focuses on the question of the device acceptability. Image credit: BA Systèmes.



APLIKÁCIE

HAL for Medical Use – Lower Limb Type is a medical device for people who have disorders in the lower limb and people whose legs are weakening. It is the world's first robotic treatment device that opens up the possibility of walking again. Image credit: CYBERDYNE INC.



Keeogo™ is a powered walking assistance device and is a product in the class of Dermoskeletons™. Keeogo™ is designed to help individuals with mobility related challenges that limit their ability to participate in daily activities such as walking, climbing or descending stairs, sitting down or standing up. Keeogo™ utilizes sensors at the knee and hip joints to detect movements, then provides the needed assistance. Image credit: B-TEMIA™.



APLIKÁCIE

TWIICE is a modular and customizable exoskeleton for walking assistance that allows paraplegics to regain independence in their daily activities. The device was designed to meet a variety of pathologies, symptoms, morphologies, and expectations. Image credit: Twice; <http://twiice.ch>.



Shown is the world's first infant gait exoskeleton ATLAS 2030 developed by Marsi Bionics which is the first pediatric exoskeleton in the market. It has been optimized for children with severe neuromuscular diseases, such as Spinal Muscular Atrophy. The exoskeleton adapts in dimension to the child growth. Image credit: Marsi Bionics.



APLIKÁCIE

Milagrow Wheeme is the World's First Robotic Body Massager that gently massages and caresses as it rolls over the body and relaxes tired muscles. It navigates gently and safely on a human body without falling off, if the angle is less than 45 degrees. It is very effective for lower back pains. Source: Milagrow



P-Rob 2R is a safe robotic arm with a high level of acceptance by operators due to its ease of control and its appealing and compact design. P-Rob is used in mobile and medical applications to assist health professionals and patients in daily tasks to improve efficiency but also the independency of people. The cover of the robotic arm consists of a soft shell combined with a synthetic antibacterial skin to lower haptic barriers and to support safety. Image credit: F&P Robotics AG.



PROJEKT UAVLIFE





PROJEKT SAHARRA





REHABILITÁCIA S ROBOTOM

Lower Limb Rehabilitation



SLOVAK UNIVERSITY OF
TECHNOLOGY IN BRATISLAVA
FACULTY OF ELECTRICAL ENGINEERING
AND INFORMATION TECHNOLOGY

URK
Ústav robotiky a kybernetiky



ULTRAZVUKOVÁ TERAPIA MÄKKÉHO TKANIVA KOLENA



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TECHNOLOGY IN BRATISLAVA
FACULTY OF ELECTRICAL ENGINEERING
AND INFORMATION TECHNOLOGY

ĎAKUJEM ZA POZORNOSŤ

