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## ABSTRACTS

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### USE OF ADDITIVE MANUFACTURING IN VETERINARY MAXILLOFACIAL PROSTHETICS

(pages 105-110)

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**Keywords:** veterinary medicine, orthodontics, 3D printing, maxillofacial, prosthetics

**Abstract:** The article is focused on orthodontic disorders and the use of additive production in solving problems in the maxillofacial area. Important information in veterinary orthodontics is the knowledge of the most common orthodontic disorders occurring in animals of various species and the consequences of not resolving these disorders. Dental health is no less important for both domestic and farm animals. With new approaches such as additive production, it is possible to achieve individualized aids that can be applied to any animal. The aim of the article is to draw attention to additive production and to point out its potential in the field of veterinary orthodontics. Examples of the use of additive production in this area can be found at the end of the work.

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### ANALYSIS OF THE SELECTED SIMULATION SOFTWARE PACKAGES: A STUDY

(pages 111-120)

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**Keywords:** Industry 4.0, simulation, discrete-event simulation, simulation software package

**Abstract:** The simulation software market is becoming more complex and universal. Computer simulations are thus more accessible and are becoming a modern tool that has a wide application in industry. Their potential and benefits can be used in small and large projects. A simulation model can take into account inventory, assembly, production and human resources, leading to decisions that can maintain or improve efficiency at the lowest possible cost. The data obtained through the simulation allow to test different combinations and scenarios in the virtual world. The benefits of manufacturing simulation include reducing investment risk, minimizing waste, improving efficiency, reducing energy consumption and even increasing worker health. The question arises as to which of the possible simulation packages is the most suitable for a given company, so that the investments made are the best possible. In the first part of the paper the theoretical basis of simulation in Industry 4.0 is presented, including the description of the possible simulation modelling tools. The second part of the paper offers comparative and descriptive analysis of six selected discrete-event simulation software packages – AnyLogic, Arena, FlexSim, SIMUL8, Tecnomatix Plant Simulation and WITNESS. The given simulation tools are compared based on their main characteristics, simulation features, application areas and popularity among the companies which use simulation software packages.

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## EFFECT OF NEURAC THERAPY ON PLANTAR PRESSURES DISTRIBUTION AND THE CENTER OF GRAVITY OF THE HUMAN BODY

(pages 121-124)

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**Keywords:** Redcord system, baropodometry, center of gravity, pelvic position, Neurac

**Abstract:** Nowadays, the pathophysiological posture is a problem for a large part of the population, which leads to a deterioration in the quality of life as a result of functional disorders of the human musculoskeletal system. The aim of the presented article is to point out the effectiveness of movement therapy for the correction of the pelvic position and subsequent adjustment of the body posture, which is evaluated by a change in the distribution of plantar pressures as well as the position of the center of gravity projection. Observations were made on three subjects who reported pain in different areas of the body as a result of incorrect body posture. Input and control measurements were performed on a baropodometer, and Neurac movement therapy in the Redcord system was applied between the individual measurements.

The individual exercises were chosen specifically with regard to affect the specific muscle groups. After evaluating the measured data, it can be stated that the selected movement therapy has a significant effect on the correction of pathophysiological position, which is also demonstrated by changing the distribution of plantar pressures, adjusting the position of the center of gravity projection and also significantly eliminating painful symptoms and increasing movement comfort.

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## NUMERICAL SIMULATION OF ECCENTRICITY CREATION IN THE PRODUCTION OF HOT ROLLED TUBES

(pages 125-129)

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**Keywords:** eccentricity, piercing press, tube, numerical simulation, DEFORM-3D

**Abstract:** The paper deals with the issue of eccentricity in the technological node of the piercing press, under selected conditions, which result from the possibilities of production in the conditions of ŽP a.s. These conditions were verified and adapted to the rolling process. This process consisting of individual technological nodes on the rolling mill, in which eccentricity is created on the piercing press and the following steps eliminate it in other technological nodes. For quality analysis of manufacturing tubes using numerical simulation, it is necessary to know the actual state of eccentricity creation on the rolling mill. A numerical simulation of piercing under different input conditions was used (software DEFORM-3D) and was performed for several different charge states before entering onto the piercing press. The eccentricity itself has a significant effect on the resulting geometric quality of the tubes.

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## THE COMPARISON OF THE DYNAMIC TESTS RESULTS FROM SENSORY PLATFORMS

(pages 131-134)

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**Keywords:** baropodometry, gait line, plantar pressure

**Abstract:** The article deals with dynamic plantography, which is a popular diagnostic method focused on assessment of the foot condition during walking and to expose foot disorders. The aim of the paper is to discover whether it's possible to do dynamic analyses on short platforms by using comparison of short and long sensory platform output. To get dynamic output were used ImportaMedica platforms, specific long platform Elegance and short platform Speed. Three subjects were involved in dynamic test on both platforms. The evaluated parameters were surface of the foot, maximum and average pressure, speed and gait line. By comparing these parameters the biggest difference was discovered in adapting walking because of the correct tread on short platform. When comparing the outputs from the long and short platforms, a longer duration of the right and left footsteps was recorded for all three subjects on the short platform.

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