**Model of ergonomic assembly line balancing in the production of commercial vehicles**

In scientific and theoretical terms, the term "assembly line balancing" is defined as the even distribution of operations between the line's workstations so that the downtime of individual machines is minimised. Ergonomics, on the other hand, as a scientific discipline dealing with working conditions to the anatomical and psychophysical capabilities of the human being, is usually neglected in the context of a balanced assembly line. Assembly and production processes are not yet fully automated due to high costs, and therefore still require the employment of workers whose physical condition in relation to the demands of the workplace may be compromised in the long term due to the organisation's disregard for ergonomics. Companies are constantly competing globally, and by effectively planning processes and production with ergonomic factors in mind, they can maintain and continuously improve their competitiveness in the long term. This dissertation complements existing scientific models for assembly line balancing by including ergonomic factors such as the balanced loading of specific muscle groups of workers. The author's defined objective is to develop a model for ergonomic balancing of the production line, taking into account workload and strenuousness.

Through a literature study, important research gap in the field of assembly line ergonomic compensation and its evaluation were identified. In order to deepen the issue, the author conducted a survey and an expert study using the Delphi method. In further research, he developed a conceptual model based on objective and subjective assessment of biomechanical loading and previous research findings. Supported by the PyCharm Community Edition 2021.3.2 environment, he transferred the conceptual model into a tool, creating a computerised model using the Python programming language. The designed linear programming (LP) model uses the OR-Tools tool library. It collects the constraints to meet ergonomic line balancing and precisely answers the question of whether existing constraints can be met and, if so, gives examples of a solution for how employees should change their workstations during a given week.

In the further part of the research work, a model of ergonomic line balancing was proposed, which considers the stages of proceeding in order to balance the assembly line. Each of them includes criteria important for protecting the employee against excessive workload and strenuous work. The degree of their fulfillment allows to assess the balance of the assembly line.