Abstracts for Bulgaria

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Kurennov D.V., Petunin A.A., Repnitskii V.B. About one algorithm of the broken line approximation and a modelling of tool path for CNC plate cutting machines

The problem of approximating two-dimensional poly-line with composite curve consisting of arc and line segments is considered. The resulting curve nodes have to coincide with source poly-line nodes. This problem arises in the development of control programs for CNC (computer numerical control) cutting machines, permitting circular interpolation. An original algorithm is proposed minimizing the number of nodes for resulting composite curve. The algorithm is implemented in the environment of the Russian CAD system T-Flex CAD using its API (Application Program Interface). The algorithm optimality is investigated. The result of test calculation along with its geometrical visualization is given.

Petunin A.A., Polishuk E.G., Chentsov A.G., Chentsov P.A., Ukolov S.S. About some types of constraints in routing problems

Many routing problems arising in different applications, can be interpreted as a discrete optimization problem with additional restrictions. The latter include generalized travelling salesman problem (GTSP), to which task of tool routing for thermal cutting sheet CNC machines is sometimes reduced. Technological requirements bound to thermal fields distribution during cutting process are of great importance when developing algorithms for this task solution. These requirements give rise to some specific restrictions for GTSP. The report provides a mathematical formulation for the problem of thermal fields calculating during metal sheet thermal cutting. Corresponding algorithm with its programmatic implementation is considered. The mathematical model allowing to take such restrictions into account considering other routing problems is discussed either.