THE FORMATION OF SPATIAL DRC ON THE BASIS OF ADJACENT CIRCLES

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***Summary.* The geometrical scheme of a condensations with the purpose to formation of contour with monotonous change of curvature and constant direction of torsion is proposed in this article.**

***Keywords:* discretely presented curve (DPC), the radius of curvature, roll.**

Formulation of the problem. Construction of surfaces with enhanced dynamic qualities requires a method of forming contours with monotonous change of curvature. Currently, the most developed are the methods of forming planar contours. However, to effectively solve many practical problems requires the use of spatial curves.

Analysis of recent research. In the coming work on the subject, which developed methods of forming contours in the given conditions, is [1,2].

The algorithm proposed in [2], involves the formation of spatial DPC first order smoothness in areas with constant twisting direction. The starting point determined in terms of the range of possible tasks tryhrannykiv basic layout and assigned their specific situation. The algorithm allows to determine the possible location area points of condensation and provides, within this region, any degree of locality adjustments resulting solution. Position the main tryhrannykiv appointed in points condensation, is a parameter curve shape control, along with provisions tryhrannykiv appointed to the starting point.

In [1] the method of discrete geometric modeling flat contours second order smoothness with monotonous change of curvature. The method allows to determine the possible solution of the whole area, subject to additional conditions choose the best solution, ensures that no oscillations origin.

The disadvantages of the suggested method is the fact that it is designed only for the formation of flat contours.

The wording of Article purposes. The purpose of research, the results of which are set out in this article is to develop a spatial geometric scheme thickening of the duodenal DPC monotonous change of curvature.

Main part. On the basis of a number of point source formed one-dimensional spatial sight of monotonous change of curvature.

To assess the curvature of the curve is constructed, using radius of the circle defined by three consecutive points of the series. This circle of neighboring call (PC).

To assess the difficulty curve that is constructed, using the angle between the planes due to three consecutive points series. These planes will be called adjacent (PP) and denote - P_i (Fig. 1).

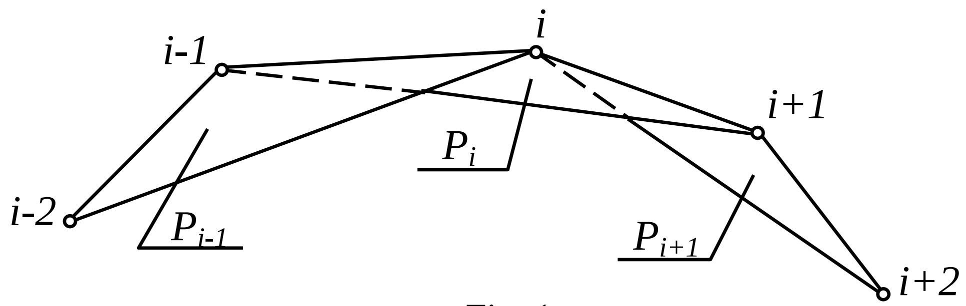

Fig. 1.

Major changes in the angle between consecutive PP determines the direction of the curve formed by twisting.

Formation of the radii of curvature of the curve at the points proposed exercise by plane spatial DPC, obtained by combining the output of the duodenum spatial plane. The values of the radii PC (R_i) plane equal to the corresponding spatial R_i spatial DPC.

Combining space with DPC carried out by the private plane around respective chords accompanying a broken line (ABL). For example, the combination of planes P_{i-1} and P_i (Fig. 1) carried out by the point series $i+1,...,n$ around the line $(i-1;i)$ in the opposite direction DPC difficulty to match and planes P_{i-1} i P_i. Consistently combining all get a private plane duodenum. It triangles caused by three successive series of points in a plane and spatial DPC congruent. So flat duodenum can be obtained by constructing these triangles on the plane, in the duodenum distances between nodes without making rotation.

The resulting flat DPC thickens method developed in [2]. The method allows to receive, at the initial point range, contours with monotonous change of curvature. Each point of condensation appointed to the straight line drawn perpendicular to the middle of the original chord ABL. Excess condensation point of the chord (h) determines R that corresponds to this point. By making these thickening finally get a sight in which the value of points equal to the radii of curvature previously designated R.

After condensation, flat DPC deployed back into space DPC. At that point, corresponding to the initial ordinary, occupy its former position. Each point of condensation settles on the circle, which is perpendicular to the plane of the original chord ABL duodenum (Fig. 2). Center circle coincides with the middle of the chord, and radius of the circle is equal to the excess of the corresponding point on the chord thickening ABL flat DPC. Points are thickening in circles so that the distance between adjacent points of condensation equal to the distance between the respective points of condensation plane DPC.

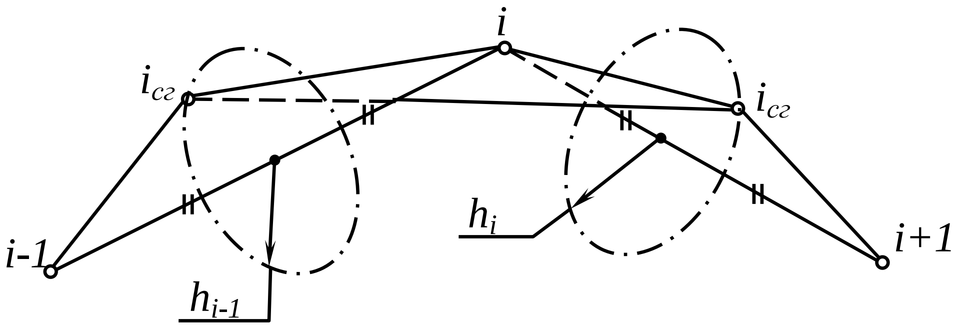

Fig. 2.

As a result, we obtain a spatial condensed DPC, which has R_i the appropriate level R_i of flat duodenum DPC.

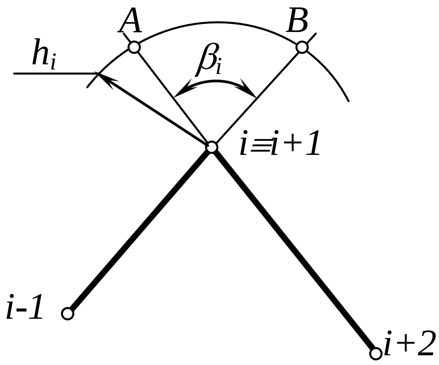

Fig. 3.

Sketch. 3 shows a plot of the original DPC $i-1...i+2$, be projected on a plane perpendicular line $(i;i+1)$.

PP P_i and P_{i+1}form a dihedral angle β_i. To obtain a result of condensation DPC, whose twisting direction is the same as in the original DPC, you must assign each point of condensation inside the appropriate angle β. For example, the condensation point corresponding to the original chord ABL $[i;i+1]$should be located on the arc $[A;B]$ of a circle condensation point position (Fig. 3). By doing the following condensation, finally, we get the sight of monotonous change of curvature and roll one direction.

Conclusions. In work the geometric spatial location thickening of the DPC monotonous change of curvature. The scheme involves the formation of the desired law of change of curvature values along the circumference, with a flat DPC, received the combination of a number of point source plane. Subsequent studies on the problems of work related to development, based on the proposed geometric scheme, spatial algorithm of the duodenum. To create the algorithm will have to solve the problem of determining the spatial coordinates of thickening DPC, according to the above scheme. The task of designing and forming flat duodenum, so the law change the values of spatial curvature along the curve, solved in [2].

Literature

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