Skinning of Circles Using Biarcs

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Interpolation of points is a momentous problem in Computer Aided Geometric Design (CAGD). We have several (now standard) methods to solve this kind of problem [1]. If we consider circles instead of points, the interpolation will be transferred to "skinning". By skinning we mean the geometric construction of two curves (often G_1 or C_1 continuous) touching each of the circles and provide a result, which is visually "satisfactory". It is very hard to define this problem with mathematical formulae, and we have not got precise definition yet. Furthermore, we have not got a well-known, ubiquitously method to get a solution. With the help of skinning we can easily design tubular structures, and it can be useful by covering problems too. There is recent numerical approach of the problem [2], but it has a lot of weaknesses by certain positions of the circles. We have submitted a manuscript [3] to the journal *Computer Aided Geometric Design*, in which we present a method. With this presented algorithm we can easily compute skinning curves and it works in the above-mentioned problem cases too.

In this paper we present a new method, where the skinning curves are composed of *biarcs*. A biarc is a G_1 continuous curve, which is composed of two arcs [4]. The real power of this method is, that it uses only biarcs for the construction and it also works in the above-mentioned problem cases too. So it can be useful by applications, where this is essential, e.g. CNC cutting. It can easily implemented and it can be used by an interactive, dynamic software, because it is fast. Furthermore, the user must determine only the circles.
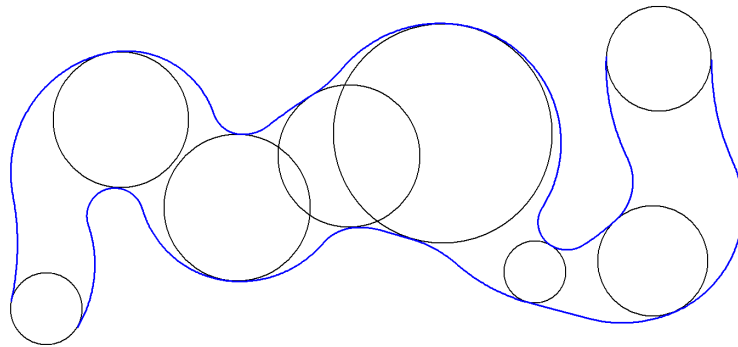

Figure 1: Skinning of circles using biarcs

Keywords: skinning, circles, interpolation, biarcs

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