The FreeCAD project association AISBL

Rue Docteur Kuborn 31 / 46
1070 Anderlecht, Belgium
VAT BE 0781 867 807
https://freecad.org
fpa@freecad.org

FreeCAD curved geometry improvement agreement

This agreement is made, on December 5th, 2023, between **the FreeCAD project association** (the **FPA**), a non-profit body registered as an AISBL in Belgium under enterprise number 781867807 and FreeCAD contributor **Ajinkya Prashant Dahale** (the **CONTRIBUTOR**), a citizen of India with residence at ███████████████████ ███ This document constitutes a non-employment service agreement between these two parties, who agree to the following terms and conditions:

Purpose and objectives

General, complex parametric curves and surfaces are an important part of any competitive 3D modelling software. In FreeCAD, particularly in the Sketcher workbench which provides the 2D basis for creating 3D models, there is already full support for primitive 2D geometries including straight lines, circles and conics, and progress has been made to support non-uniform rational basis spline curves (hereafter referred to as "B-splines"). There are, however, certain constraints not supported for B-splines in Sketcher. Additionally, under some circumstances, it is more useful to describe curves through other methods, for example Bezier curves or Hermite splines.

This agreement aims at bettering the support for curved geometry in FreeCAD by helping the **CONTRIBUTOR** to dedicate time for the features described herewith.

Duties

During the time covered by this agreement, the **CONTRIBUTOR** agrees to:

- Develop, within the timeline as described below in this document, the following features (hereafter called deliverables), and publish them for consideration (review) to be included in the release build of FreeCAD:
  - In the Sketcher workbench, a method to constrain B-splines to be tangent with any other curve that can at present be created in the workbench (hereafter referred to as "general B-spline tangency").
  - In the Sketcher workbench, a method to define the radius of curvature at a point on any curve that can at present be created, and/or a method to constrain curvatures of said curves to be equal at the connected endpoints (hereafter referred to as "curvature constraint").
  - In the Sketcher workbench, during creation of a B-spline, the ability to display the shape of the final curve (hereafter referred to as "direct draw B-spline").
  - In the Sketcher workbench, a method to create rational Bezier curves, and methods to add constraints to these Bezier curves equivalent to those possible with other curves that can at present be created (hereafter referred to as "Bezier curves support").
  - In the Sketcher workbench, a method (hereafter referred to as "join curves with higher order continuity") to, given two end points of any presently creatable curve(s), replace the curve(s) with a B-spline (in case the endpoints belong to the same curve, the B-spline shall be periodic), such that
    - the shape of the B-spline exactly matches (or if the endpoints are not coincident, closely resembles) the combined shape of both curves;
    - any constraints on the replaced curve(s) are transferred to this B-spline; and
    - if there is a tangent (or curvature) constraint between the curves at these two end points, the new B-spline has tangent (respectively curvature) continuity at the point replacing these endpoints.
  - Upon mutual agreement, any other feature in the Sketcher workbench, or in any other part of FreeCAD, or in any present or future dependency of FreeCAD, that both parties consider should be part of the scope of this agreement.
- Address any issues found with the deliverables during review
- Document publicly all of the processes performed by the **CONTRIBUTOR**

During the time covered by this agreement, the **FPA** agrees to:

- Pay the **CONTRIBUTOR** the amount described below in this document
- Help the **CONTRIBUTOR** to perform their part of this agreement whenever needed

Conditions and compensation

A compensation totalling **USD 5000** will be paid by the **FPA** to the **CONTRIBUTOR**, in parts upon satisfactory completion of each of the deliverables as described below, or in lump sum or parts by mutual agreement, by bank transfer. All Bank transfer and other transfer fees will be paid by the **FPA**. The division will be as:

1. General B-spline tangency and curvature constraint: USD 1250
2. Direct draw B-spline: USD 1000
3. Bezier curves support: USD 1500
4. Further join curves support: USD 1250

The tasks described in this agreement will be organised and performed by the **CONTRIBUTOR** in the manner, schedule and time frame that the **CONTRIBUTOR** sees appropriate, from their own location, using their own equipment, and establishing their own schedule and timetable. The **CONTRIBUTOR** is the sole responsible for the quality of their work. There is no subordination relationship between the **FPA** and the **CONTRIBUTOR**.

This agreement is a strict non-employment agreement. The **CONTRIBUTOR** agrees to the conditions of this agreement as an independent worker. There is no employment relationship between the **FPA** and the **CONTRIBUTOR** The **CONTRIBUTOR** is solely responsible for paying all taxes such as revenue taxes incurring from the revenues obtained from this agreement, and for paying all social security contributions needed in the **CONTRIBUTOR's** country, and any other expense needed to perform their work as an independent worker.

The **CONTRIBUTOR** will be ready at all times to prove their independent worker status by showing documents like proof of payment of revenue taxes or conformity of their situation against social security, if requested by the **FPA**.

The **CONTRIBUTOR** will not hold the **FPA** responsible for any injury or material loss occurring during the execution of the tasks described in this agreement.

Termination and renewal

This agreement will last until all deliverables described in this agreement are completed, or until February 29, 2024, whichever is earliest.

Both the **FPA** and the **CONTRIBUTOR** can unilaterally terminate this agreement at any time, for any reason, by simple notification to the other party. The **FPA** will pay the **CONTRIBUTOR** a mutually agreed portion of the compensation if there has been partial progress towards any incomplete deliverable.

This agreement is ruled by Belgian law, and the competent court is the Brussels court. However, both parties agree to always seek friendly resolution in case of conflicts, and to always consider the best interest of the FreeCAD project.

Done in Brussels on December 5th, 2023

For the **FPA**

Yorik van Havre, president

The **CONTRIBUTOR**

Ajinkya Prashant Dahale