## Appendix:

The explicit form of the Bezier curves is as follows:

|  |  |  |
| --- | --- | --- |
|  |  | (A1) |

The order of a Bezier curve can be calculated according to the number of control points that are used to generate the curve. The order of a Bezier curve is related to the control points with the following equation:

|  |  |  |
| --- | --- | --- |
|  |  | (A2) |

If the order of the curve is taken as 2, the Bezier curve for the *kth* fibre becomes quadratic:

|  |  |  |
| --- | --- | --- |
|  | , | (A3) |

In Eq. (A1), is the binomial expansion which can be calculated as,

|  |  |  |
| --- | --- | --- |
|  |  | (A4) |

The control points of the *kth* fibre (), used to generate the fibrous networks in the two-dimensional case, are provided as , and .

If control points () are substituted into Eq. (A3), the following equation is obtained explicitly:

|  |  |  |
| --- | --- | --- |
|  | , | (A5) |

The mathematical equation of each fibre can be written according to the parametric form of the curve in 2D space as

|  |  |  |
| --- | --- | --- |
|  | , | (A6) |

where . Here, is the path of the fibre in vector form, (t) and (t) indicate and components of this fibre path, respectively. After some mathematical manipulations, the fibre path for the *kth* fibre is written based on the quadratic Bezier curve:

|  |  |  |
| --- | --- | --- |
|  | , | (A7) |