

## 8.2 Cursive Spline

Splines are a method of interpolating data points. They result in a smooth interpolation that is relatively “cheap” to compute. MATLAB has a method for creating and evaluate the resulting polynomials (`spline`) so you do not have to know the details. For a function  $y(x)$ , (for example, `sine`) one can see that with very few points (try 5 points in  $[0, 2\pi]$ ) one can very closely approximate the original functions. You can also approximate a “parametric curve”  $(x(t), y(t))$  by using a spline for each of the functions separately and then plotting the resulting function  $y$  vs.  $x$ . Do this with (for example) your name written in cursive. Write your name on graph paper, place a few points for each of the letters (chose them “wisely”) and take down the coordinates of the points. In MATLAB, create two vectors with these data and find the spline approximation to each of the functions  $(x(t)$  and  $y(t))$ . Plot the resulting  $y$  vs.  $x$ . Despite only using a few points for each letter, the resulting plot should be nice and smooth.

Take this to the next level: Write down many (all?) separate letters of the alphabet in script. Figure out a way to combine letters into words and then write code that takes as input a string, and creates as output the cursive-written word(s). Can your code be flexible enough to deal with the letters f, i, j, t, and x? You might want to use a “map” type container to hold your data (find help on that via `help containers.Map`).

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