1_SVG_converter_Gold

January 16, 2021

In [3]:
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## Python basics for novice data scientists, supported by Wagatsuma Lab@Kyutech
#
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#
# # @Time    : 2021-1-16
# # @Author  : Hiroaki Wagatsuma
# # @Site    : https://github.com/hirowgit/2BO_python_optmization_course
# # @IDE     : Python 3.7.7 (default, Mar 10 2020, 15:43:27) [Clang 10.0.0 (clang-1000
# # @File    : SVG_converter_Gold.py

import numpy as np
import matplotlib.pyplot as plt

from svg.path import parse_path
from svg.path.path import Line
from xml.dom import minidom

from time import time
import pandas as pd

def line_splitter(start, end):
    return (lambda t: (1-t)*start+t*end)

def cubic_bezier_converter(start, control1, control2, end):
    original_data = np.array([start, control1, control2, end])
    cubic_bezier_matrix = np.array([
        [-1,  3, -3,  1],
        [ 3, -6,  3,  0],
        [-3,  3,  0,  0],
        [ 1,  0,  0,  0]
    ])
    return_data = cubic_bezier_matrix.dot(original_data)

    return (lambda t: np.array([t**3, t**2, t, 1]).dot(return_data))
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# On the design of "cubic_bezier_converter" was learned from
# https://stackoverflow.com/questions/36971363/how-to-interpolate-svg-path-into-a-pixe


doc = minidom.parse('data/LaneMap2.svg')
path_strings = [path.getAttribute('d') for path
                in doc.getElementsByTagName('path')]
doc.unlink()

points_np_all=[]
points_np_all=np.empty((len(path_strings)),dtype=object)
print(len(points_np_all))
#points_np_all[k]=np.array([])

for k in range(len(path_strings)):
#for path_string in path_strings:
    path = parse_path(path_strings[k])
    points_np_merge=np.empty((0,2), float)
    #points_np_merge=np.empty(points_np_merge)
    for dat in path:

#path=parse_path(path_strings[block])

#dat=path[key]

        if type(dat).__name__=='CubicBezier':
            start_np = np.array([dat.start.real, dat.start.imag])
            control1_np = np.array([dat.control1.real, dat.control1.imag])
            control2_np = np.array([dat.control2.real, dat.control2.imag])
            end_np = np.array([dat.end.real, dat.end.imag])
            converted_curve = cubic_bezier_converter(start_np, control1_np, control2_np
            #
            diff_np=start_np-end_np
            n_dots=np.round(np.linalg.norm(diff_np))
            #
            points_np = np.array([converted_curve(t) for t in np.linspace(0, 1, n_dots)
        elif type(dat).__name__=='Line':
            start_np = np.array([dat.start.real, dat.start.imag])
            end_np = np.array([dat.end.real, dat.end.imag])
            converted_line = line_splitter(start_np,end_np)
            #
            diff_np=start_np-end_np
            n_dots=np.round(np.linalg.norm(diff_np))
            #
            points_np=np.array([converted_line(t) for t in np.linspace(0, 1, n_dots)])
        elif type(dat).__name__=='Move':
            #
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            n_dots=1
            #
            start_np = np.array([dat.start.real, dat.start.imag])
            end_np = np.array([dat.end.real, dat.end.imag])
            points_np = np.array([start_np,end_np])
        else:
            points_np=np.array([])
        #points_np_merge=np.concatenate(points_np_merge,points_np)
        points_np_merge=np.append(points_np_merge, points_np, axis=0)
#         if k==0:
#             points_np_merge=points_np
#         else:
#             points_np_merge=np.append(points_np_merge,points_np,axis=0)
        #plt.plot(points_np[:, 0], points_np[:, 1], '.-')
        #plt.show()
        #print(len(points_np))
        #print(len(points_np_merge))
    #points_np_all1=points_np_all1.append(points_np_merge)
    #points_np_all=points_np_merge
    points_np_all[k]= points_np_merge
#     points_np_all=points_np_all.append(points_np_merge)
    #print(len(points_np_all))
    print(' %d : %d dots' % (k,len(points_np_merge)))
    #plt.plot(points_np_merge[:, 0], points_np_merge[:, 1], '.-')
    #plt.show()


len(points_np_all)

len(points_np_all)
for k in range(len(points_np_all)):
    points_np=points_np_all[k]
    plt.plot(points_np[:, 0], points_np[:, 1], '.-')
plt.show()

maxL=max(len(points_np_all[k]) for k in range(len(points_np_all)))

label=np.empty([],dtype='unicode')
print("label size = %d" % (label.size))
label=[]
for k in range(len(points_np_all)):
    label=np.append(label,["x%d"%(k+1),"y%d"%(k+1)])
dat_df = pd.DataFrame([],columns=label)
for k in range(len(points_np_all)):
    points_np=points_np_all[k]
    tmp0=np.zeros([maxL,2])
    tmp0[0:points_np.shape[0],:]=points_np
    dat_df["x%d"%(k+1)] = tmp0[:,0]
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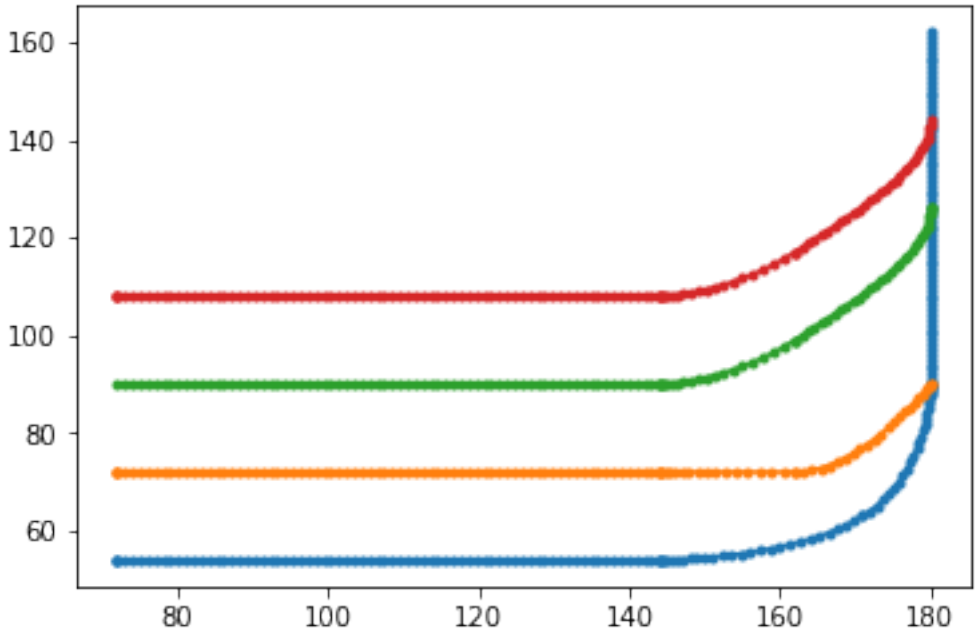
```
            dat_df["y%d"%(k+1)] = tmp0[:,1]

        print(dat_df.shape)
        dat_df

        dat_df.to_csv('output/to_csv2.csv')
```

```
4
 0 : 202 dots
 1 : 117 dots
 2 : 126 dots
 3 : 126 dots
```




```
label size = 1
(202, 8)
```

In [ ]: