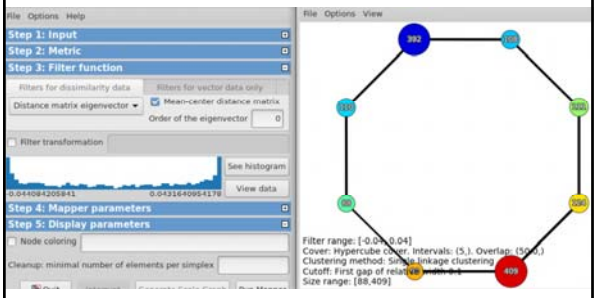
danifold.net/mapper/node_coloring.html

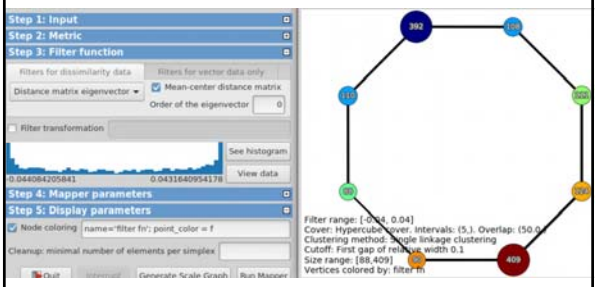
Node coloring

By default, the nodes in the Mapper output are colored by the average filter value: for all points in a node, the average filter value is computed, and then a color map is applied to all nodes. Currently, the color map is Matplotlib's default "jet" color map, with a range from the lowest to the highest filter value of all points. Low filter values are represented by blue, high filter values by red.

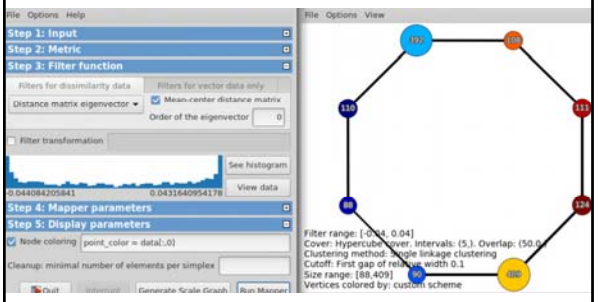
The "jet" color map



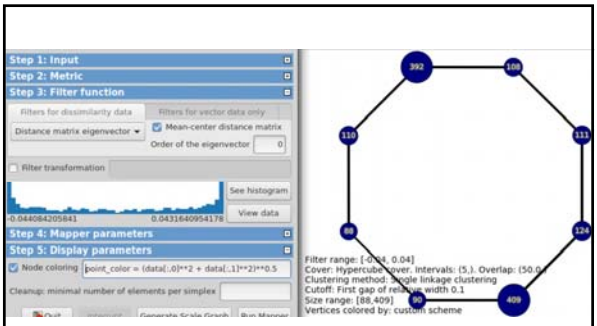
Default coloring is average filter value



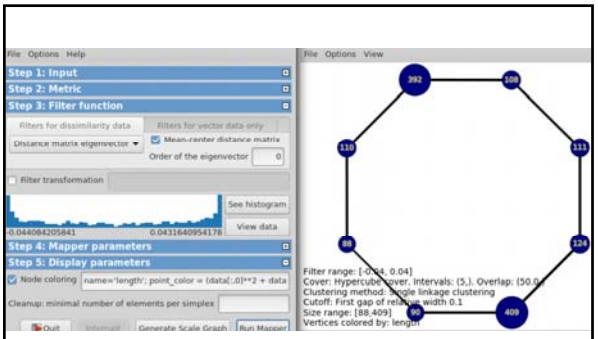
Can also specify color by filter function via
point_color = f



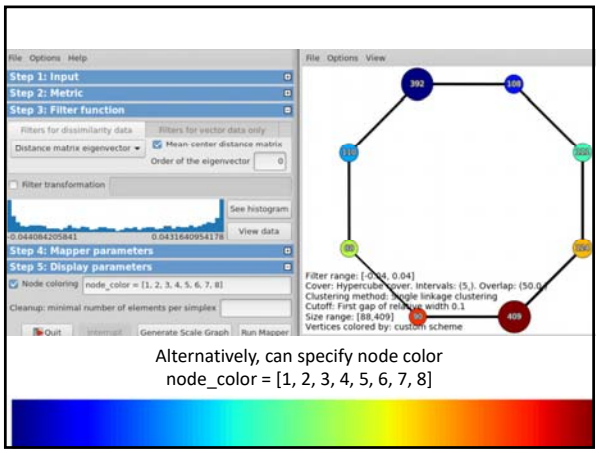
point_color = data[:,0]



point_color = (data[:,0]**2 + data[:,1]**2)**0.5



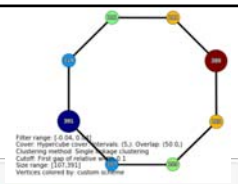
name = 'length';
point_color = (data[:,0]**2 + data[:,1]**2)**0.5



Alternatively, can specify node color
node_color = [1, 2, 3, 4, 5, 6, 7, 8]

In Jupyter notebook

Choose how to color vertices in TDA mapper graph



```
nodes = mapper_output.nodes
node_color = None
#node_color = [1, 2, 3, 4, 5, 6, 7, 8]       # Coloring the 8 nodes using 1D array
#point_color = None
point_color = f          # color nodes using average filter value
#point_color = (data[:,0]**2 + data[:,1]**2)**0.5  # color nodes in mapper output using average length
#point_color = data[:,0]      # color nodes in mapper output using average of first coordinates
name = 'custom scheme'
node_color = mapper_output.postprocess_node_color(node_color, point_color, point_labels)
```

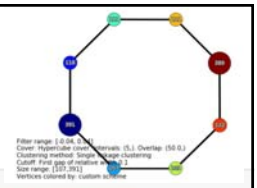
Output the color code for each node in TDA mapper graph

```
node_color
```

```
array([-0.03425722, -0.01541899, -0.01547266, -0.000479  ,  0.00117447,
        0.01467286,  0.01467839,  0.03424094])
```

In Jupyter notebook

Choose how to color vertices in TDA mapper graph



```
nodes = mapper_output.nodes
node_color = None
node_color = [1, 2, 3, 4, 5, 6, 7, 8]       # Coloring the 8 nodes using 1D array
point_color = None
#point_color = f          # color nodes using average filter value
#point_color = (data[:,0]**2 + data[:,1]**2)**0.5  # color nodes in mapper output using average length
#point_color = data[:,0]      # color nodes in mapper output using average of first coordinates
name = 'custom scheme'
node_color = mapper_output.postprocess_node_color(node_color, point_color, point_labels)
```

Output the color code for each node in TDA mapper graph

```
node_color
```

```
array([ 1.,  2.,  3.,  4.,  5.,  6.,  7.,  8.])
```

```
In [56]: nodes
```

```
Out[56]: [node((0,),array([  2,   3,   4,   8,  11,  13,  16,  18,  19,  21,  22,  23,  24
                  27,  31,  35,  39,  41,  42,  46,  47,  49,  51,  54,  58,  61,
                  64,  69,  70,  71,  74,  75,  77,  80,  81,  82,  84,  86,  88,
                  92,  95,  96,  98, 101, 103, 104, 111, 112, 113, 114, 115, 117,
                 118, 119, 120, 121, 122, 124, 125, 129, 130, 131, 132, 135, 141,
                 145, 148, 152, 153, 154, 155, 156, 157, 161, 162, 163, 166, 167,
                 169, 170, 176, 180, 182, 188, 189, 190, 196, 198, 199, 201, 204,
                 206, 210, 215, 216, 220, 224, 225, 228, 229, 235, 237, 239, 244,
                 245, 250, 251, 252, 256, 259, 262, 264, 271, 275, 277, 280, 290,
                 292, 293, 297, 298, 299, 300, 302, 318, 321, 322, 325, 329, 331,
                 336, 337, 339, 341, 343, 344, 347, 348, 350, 351, 352, 359, 360,
                 361, 362, 367, 369, 375, 376, 377, 378, 379, 380, 383, 384, 385,
                 386, 388, 389, 391, 393, 396, 397, 398, 399, 400, 401, 405, 406,
                 407, 410, 412, 413, 416, 424, 426, 427, 428, 431, 436, 438, 440,
```

```
        912, 915, 916, 918, 921, 926, 927, 933, 934, 936, 943, 950, 951,
        956, 957, 959, 961, 962, 966, 970, 971, 973, 980, 987, 988, 989, 999]),-0.036583785623022912),
 node((1,),array([  1,  16,  24,  49,  55,  68,  72, 114, 128, 132, 133, 135, 137,
        138, 162, 180, 185, 187, 189, 192, 193, 201, 206, 213, 215, 222,
        235, 244, 247, 256, 263, 290, 294, 307, 323, 350, 357, 369, 374,
        378, 380, 383, 395, 400, 401, 405, 412, 420, 431, 434, 435, 451,
        454, 455, 465, 469, 486, 487, 500, 521, 534, 535, 539, 556, 560,
        574, 582, 584, 591, 595, 596, 597, 599, 604, 612, 613, 640, 642,
        643, 645, 646, 660, 661, 672, 674, 676, 677, 708, 710, 713, 735,
        744, 757, 762, 780, 783, 788, 792, 798, 803, 819, 820, 821, 823,
        875, 880, 887, 888, 889, 896, 901, 912, 958, 971, 983, 989, 991, 994]),-0.015543559483625922),
 node((1,),array([  4,  18,  25,  31,  39,  41,  45,  58,  59,  80,  86,  94,  95,
         98, 112, 115, 118, 121, 125, 139, 141, 148, 149, 155, 166, 168,
        175, 182, 214, 216, 217, 227, 238, 245, 250, 259, 270, 297, 299,
        322, 347, 348, 359, 368, 371, 397, 410, 417, 426, 440, 446, 453,
        458, 478, 506, 507, 509, 510, 533, 551, 553, 576, 581, 603, 608,
        609, 616, 619, 630, 648, 655, 664, 667, 683, 693, 702, 715, 718,
```

```
node_color
```

```
array([-0.03425722, -0.01541899, -0.01547266, -0.000479  ,  0.00117447,
        0.01467286,  0.01467839,  0.03424094])
```