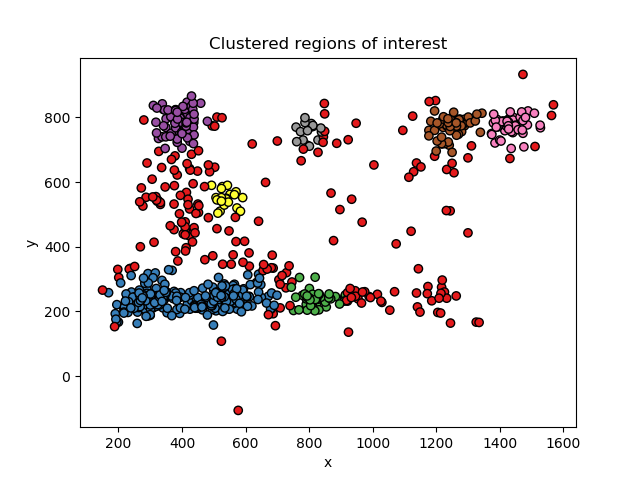
# TNM098 – Lab 2

The task was that from given data from an eye-tracking session identify regions of interest, what the user looks at and how that changes over time. The given data was pre-processed and contained fixations, where every point had 4 useful fields: Timestamp, duration, x and y coordinates.

## Method

The problem was solved using Python. First, the interesting regions were identified using the clustering method DBSCAN with and . The number of fixations within each cluster was counted, and the mean gaze duration time for each cluster was calculated. An animated plot were all fixations were drawn one at a time was compared with a plot with the clusters marked. By doing this comparison manually, the transitions between regions could be done manually.

## Result



**2**

**0**

**1**

**3**

**5**

**4**

**6**

Figure 1 - The regions identified using DBScan clustering method.

Seven regions were found using DBScan clustering which can be seen in figure 1. The red dots that doesn’t belong to a cluster is noise. Table 1 describes when the different regions are used. The timestamps were divided in ten parts, called parts 1-10 below.

Table 1 - Description of when the regions are used.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Cluster | Noise | 0 | 1 | 2 | 3 | 4 | 5 | 6 |
| Uses | 195 | 291 | 41 | 64 | 22 | 58 | 56 | 17 |
| Description |  | Is heavily used in the whole session except a small break in part 5. | Used sporadically in parts 1-3, used more frequently in part 10. | Is not used in part 1-2, is after that used continuous during the rest of the session. | Are seldom used, could almost be part of noise. Used in parts 4-5 and 9-10. | Used frequently but only in the part 4-6 of the session | | Seldom used, when it is it’s mainly in part 4-5. |
| Mean gaze duration [ms] | 331.49 | 323.93 | 432.7 | 335.5 | 379.98 | 403.68 | | 303.88 |

At first, region 0 and 1 are mostly used, and transitions is mainly between them. The first use of a region above that is after 49 seconds, and that is region 2. Up until 115 seconds only region 0, 1, 2 and 3 are used. At this point transitions are mainly between and within regions 0, 3, 2. After that region 4, 5 and 6 are used for the first time, and the transition to those regions goes most often to and from region 2, and sometimes also region 1. Next, there is a sequence where the most gazes are within region 4 and 5 and stays there. Towards the end, a part where transitions between all regions happen. Lastly, transitions are mainly within region 0, 1, 2 and 3.

## Conclusion

Since region 0 is heavily used during the whole session, one can assume that it contains important information, element with shapes and colors or animations that draws attention and the user will look at it reflexively. Also, it might change during the session which would give the user the need to look at it. The regions that have times where they are not used at all could possibly be things that disappear and show up when they are needed.