

Project in Practical Machine Learning

Radar image clustering
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Machine Learning

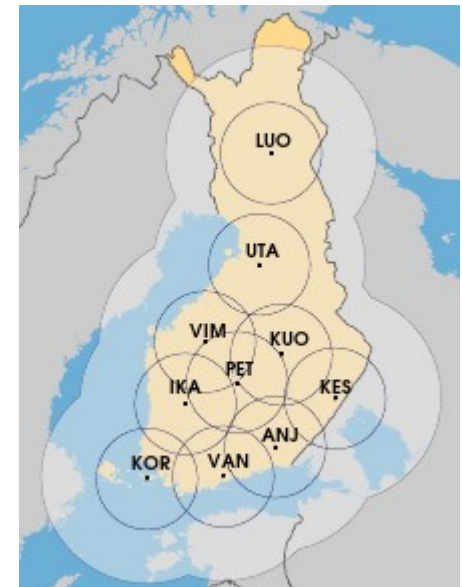
- Clustering
- Predictive clustering so far
- Implemented algorithms: k-means, k-means++ and k-medoids
- Planning to implement descriptive clustering algorithms

Data provider

- Data from Finnish Meteorological Institute (FMI)
- Offers open data
- They also have different options for open data
- FMI uses Web Map Service (WMS) to provide Weather Radar images
- WMS offers different options: for example style, resolution and format
- FMI has 10 different weather radars that cover almost all of Finland

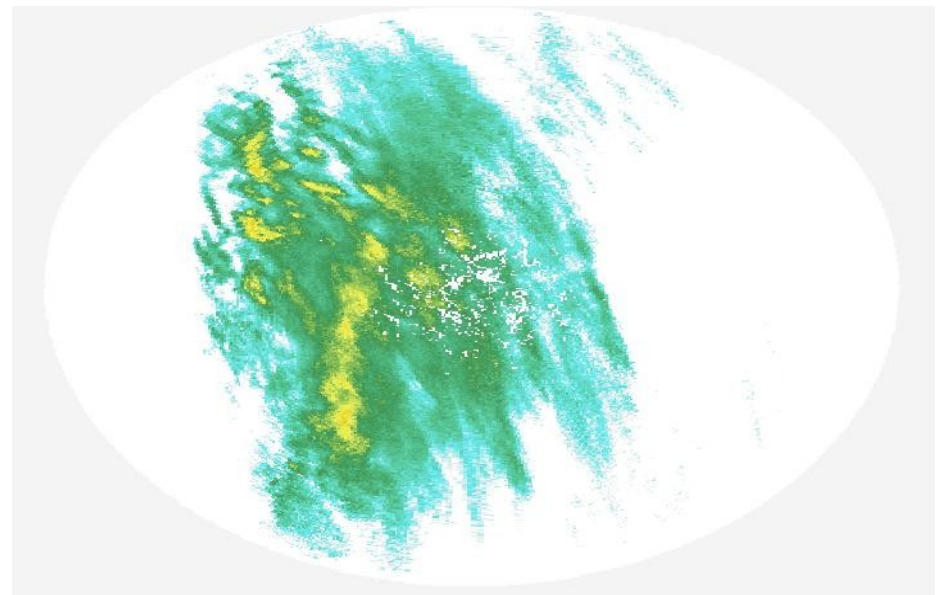
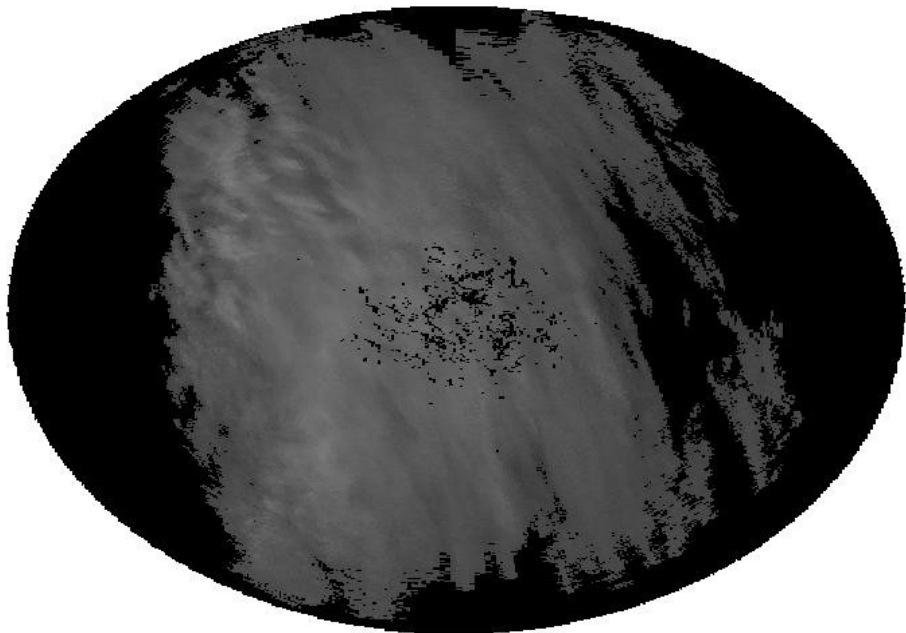
FMI's Radars

- Ten weather radars around Finland
- Cover almost all of Finland
- Four different measures: radar reflectivity, radial velocity, rain classification and cloud top height
- Anjalankoski, Ikaalinen, Kesälahti, Korpo, Kuopio, Luosto, Petäjävesi, Utajärvi, Vantaa ja Vimpeli



Data

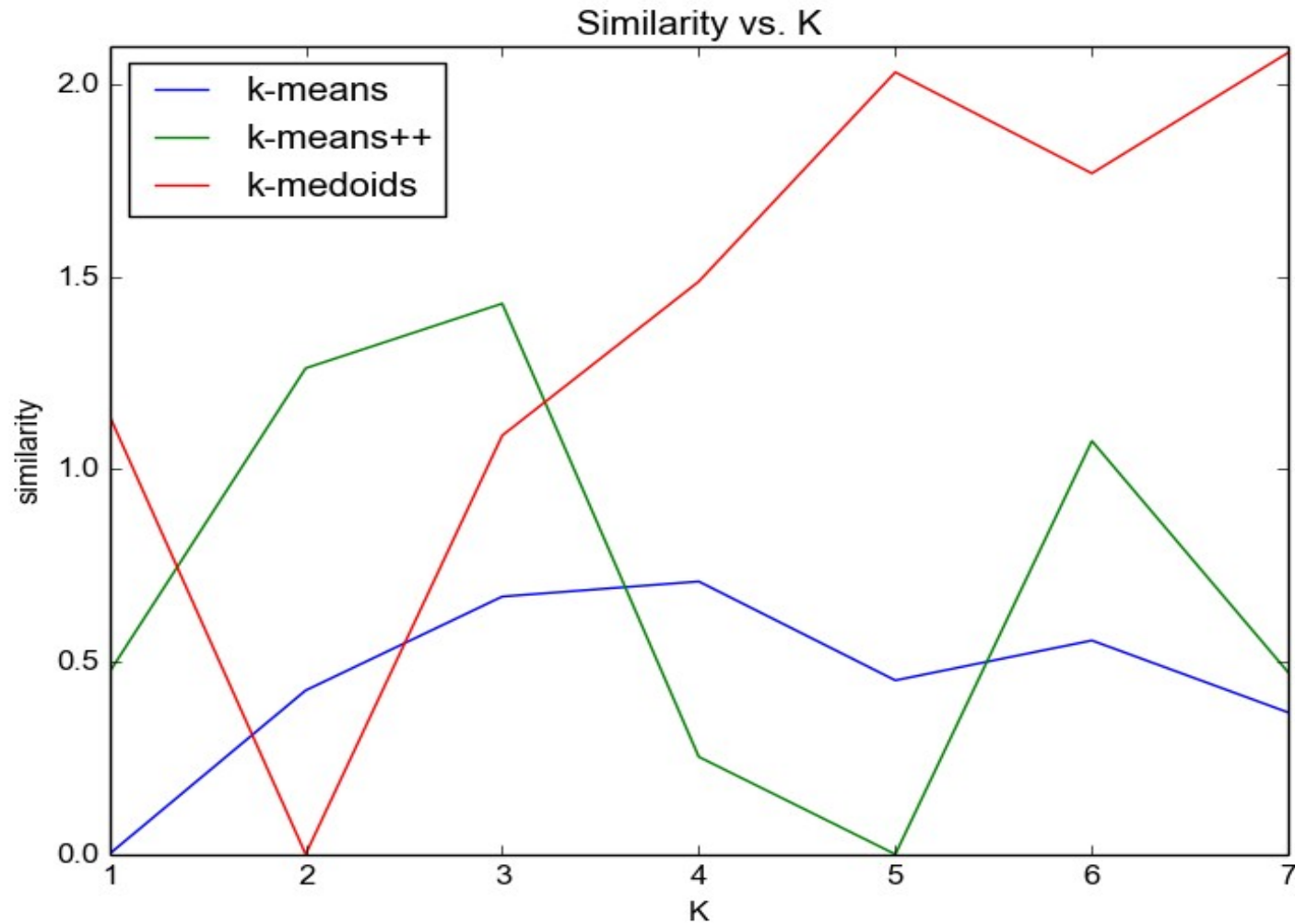
- Image resolution: 300x250 and 720x480
- Different resolution is used to compare machine learning algorithms performance
- Style options: raster and Radar dbz Summer



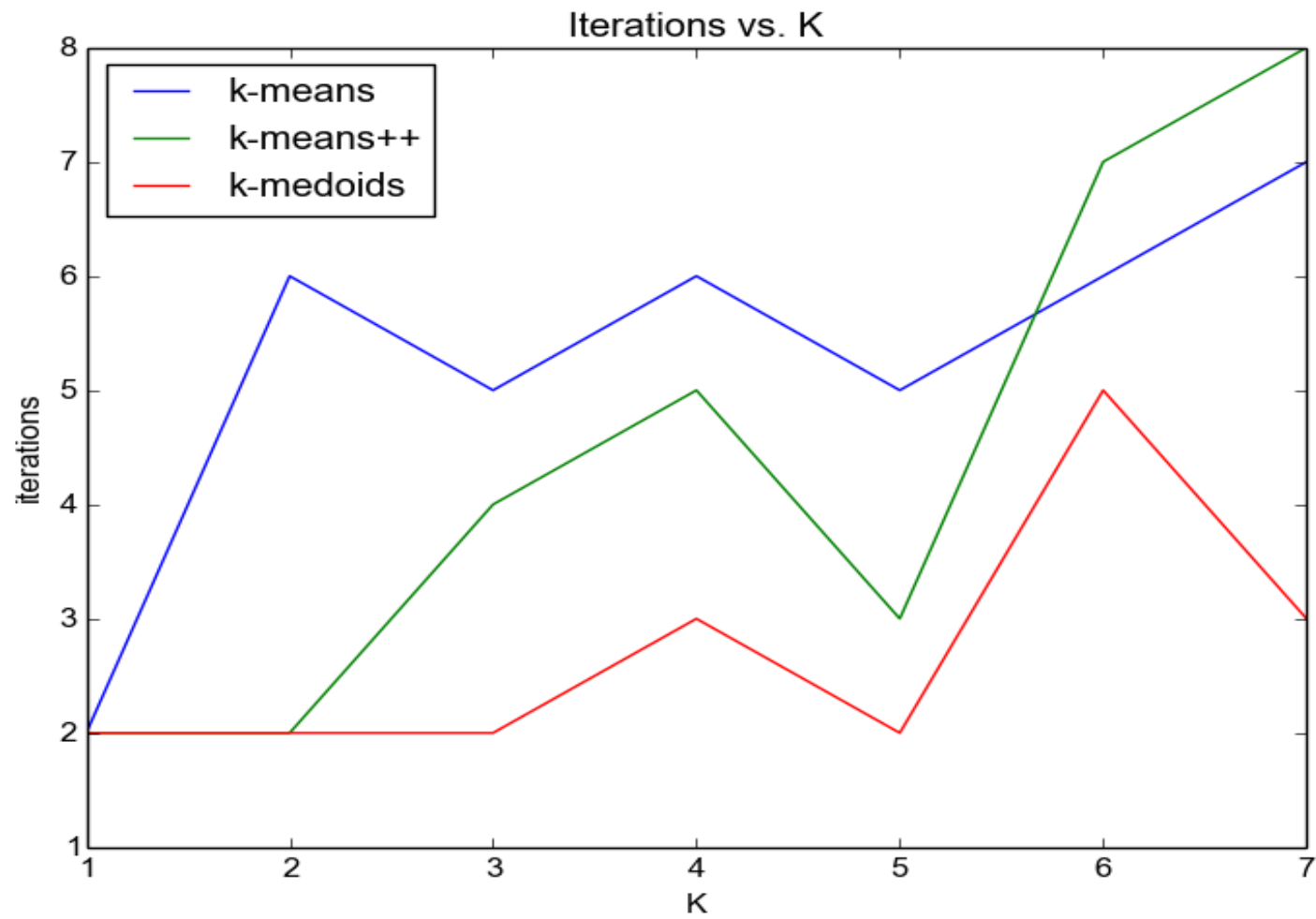
Machine Learning algorithms

- K-means with maximum iterations and initial cluster centers are selected randomly
- K-means++: only difference compared to k-means is the way that the initial cluster centers are selected
- K-medoids, the slowest (this fact was also discussed briefly in IML)

Similarity within clusters



Iterations



Sources

- ilmatieteenlaitos.fi
- en.wikipedia.org
- Flach, P. (2012). *Machine Learning: The Art and Science of Algorithms that Make Sense of Data*. Cambridge: Cambridge Univ. Press. (IML course book)