Introduction to data science & artificial intelligence (INF7100)

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#423 Coordinates

été 2020

Projection

Angles

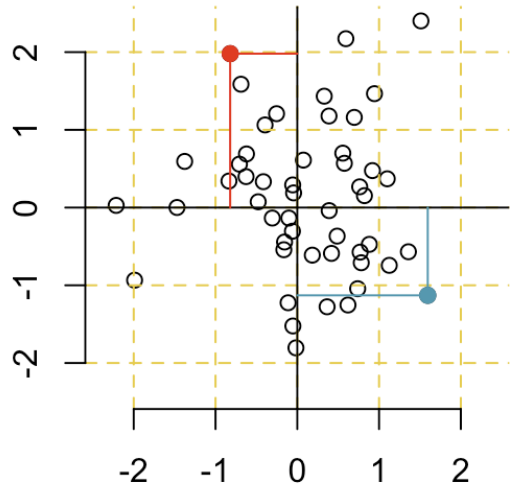
Classical reprensentation,

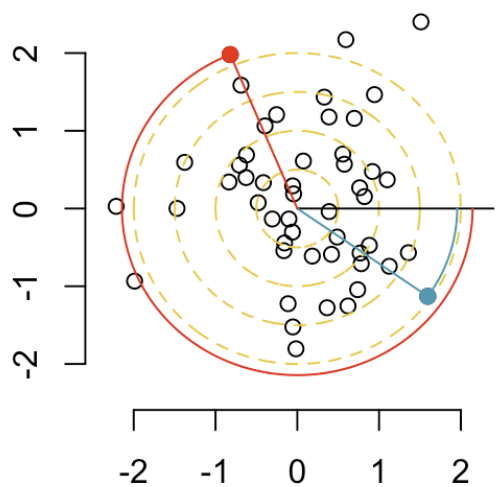
$$\boldsymbol{z} = \begin{pmatrix} x \\ y \end{pmatrix}$$ in the cartesian coordinate system

Alternatively, use polar coordinates

$$\boldsymbol{z} = \begin{pmatrix} r\cos(\theta) \\ r\sin(\theta) \end{pmatrix}$$

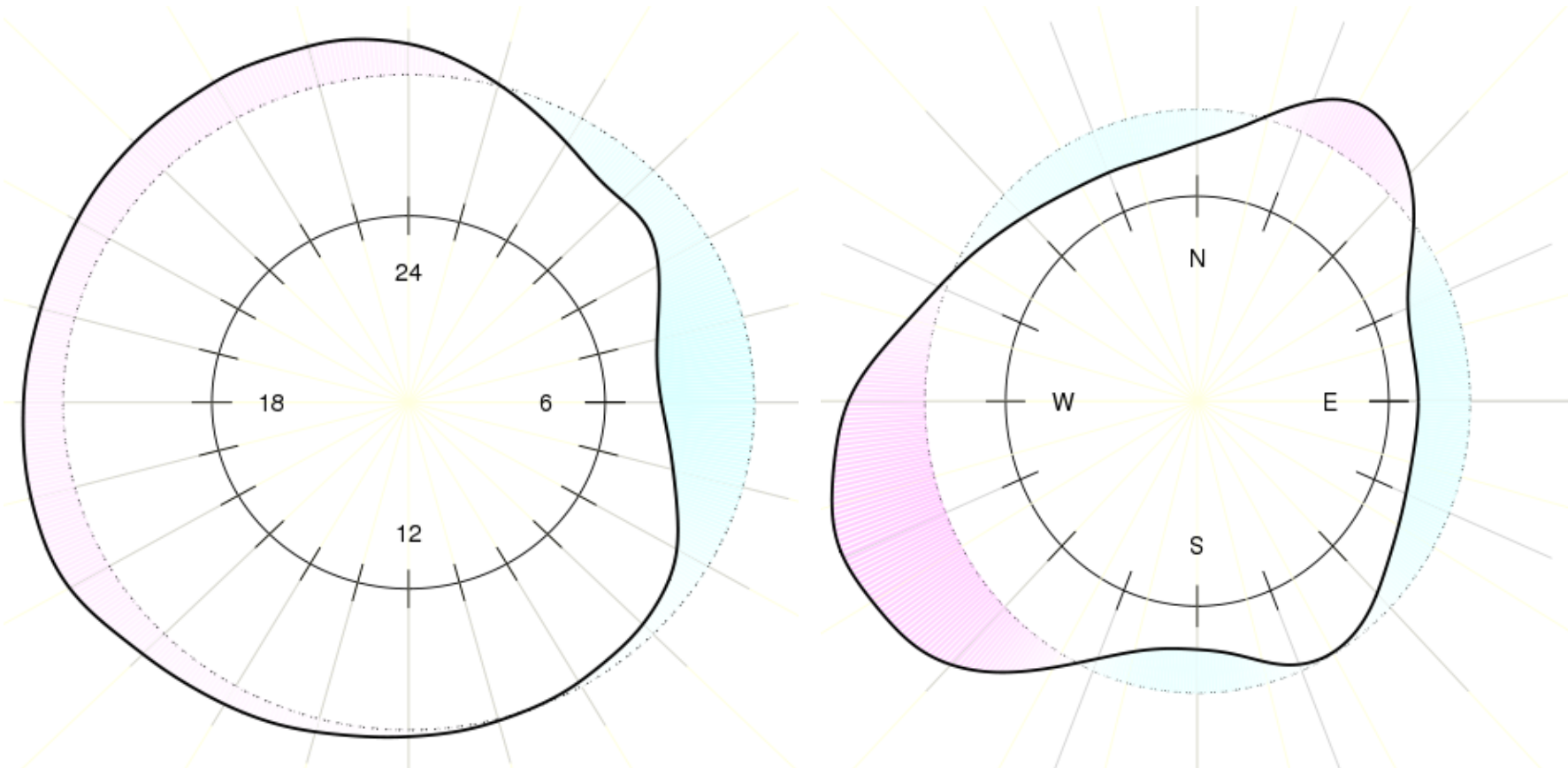
see circular data





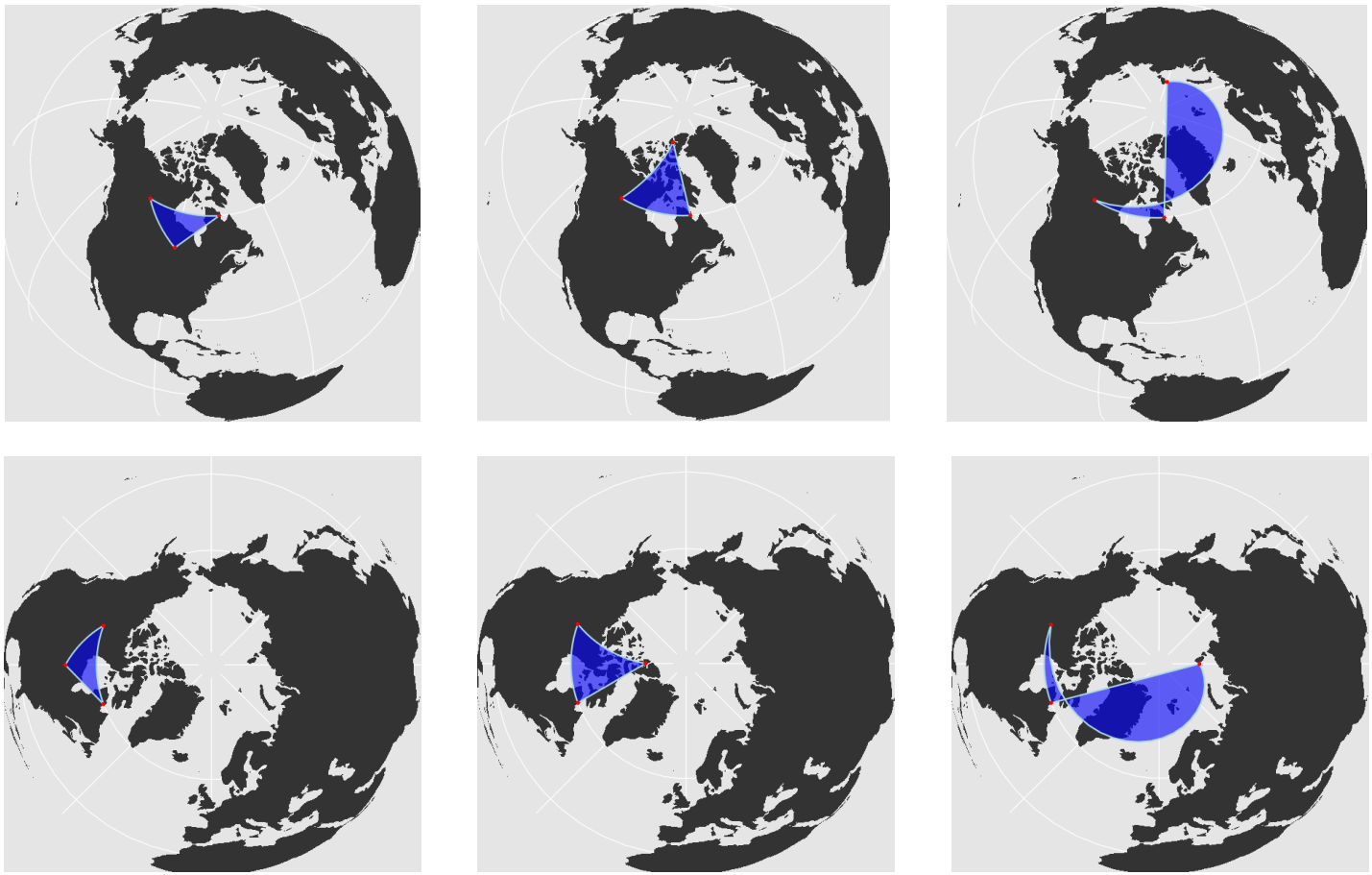
Circular Data

E.g. phone calls at 911, time of the day (left) and wind direction in Montréal (right)



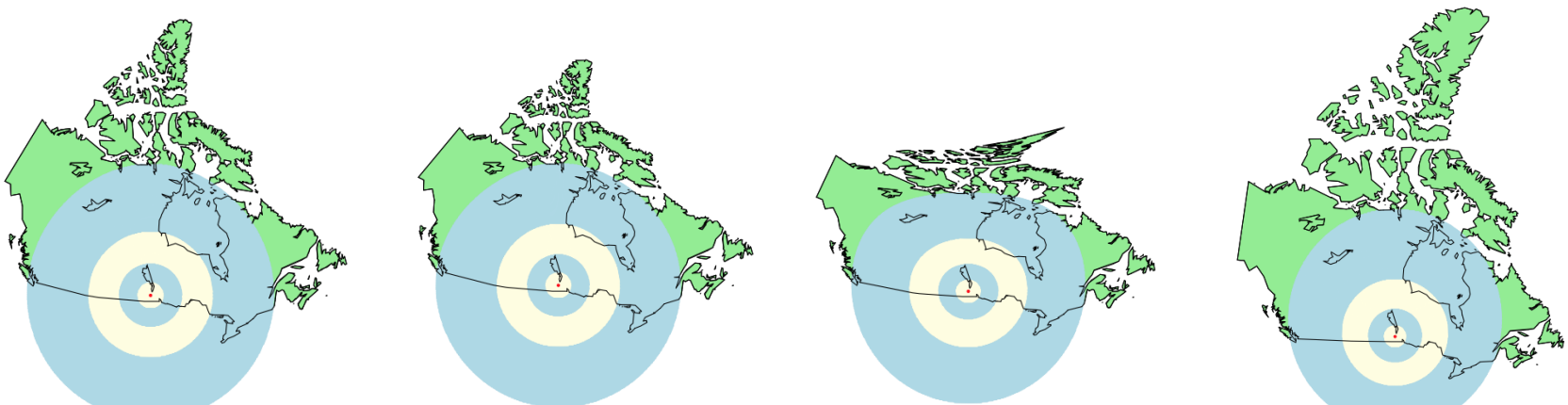
Spatial Data

Problem of circular/spherical data expressed in cartesian coordinates (latitude, longitude): singularity of the poles.



Projections

CRS (Coordinate Represenation Systems) can get complicated



Maps: Dots, Lines and Polygons

See minimalist maps (with R codes)
with dots (cities), lines (rivers, roads) and polygons (lakes)