Lecture 3

Independent Component Analysis (ICA):

→ decomposes data into minimally statistically dependent sources

different meanings of statistical dependence → different algorithms

resampling methods: assess quality of ICA projections

application of ICA often reveals stable subspaces which are physiologically plausible

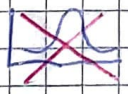
Assumptions:

- data sources are statistically independent:

$$p(x,y) = p(x) \cdot p(y)$$

(no multiple independent generators of information → no ICA needed)

- data sources have non-Gaussian distributions



Goal: maximize non-Gaussianity (kurtosis, negentropy) or minimize mutual information

Signals: $x(t)$ Sources: $s(t)$, Estimated sources: $u(t)$

Measurement $x(t) = A\,s(t)$

Unmix: $u(t) = W\,x(t)$

To optimize / learn: W