Helsinki University of Technology
Lab of Computer and Information Science

Tik-61.184 Special Course in Information Technology
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Exercises, session 1

All the exercises refer to the Hyvärinen-Oja paper.

1. Prove the properties of kurtosis in equations (18) and (19), by using the definition of kurtosis.
2. Show that after (35), $\tilde{\mathbf{x}}$ is white.
3. In the FastICA algorithm (basic, one-unit case), take a linear function as g: $g(u) = u$. What does the algorithm look like now? Can you interpret this intuitively?
4. Take a linear function as g in the algorithm in (48). Assume that the data is *not* whitened. Show that this algorithm whitens the data. Interpret the algorithm (in the ordinary ICA case, for a different g) as *nonlinear whitening* (or decorrelation).