On robust statistics, chemometrics and the importance to know what we are doing!

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There are many reasons why the quality of the research may turn unsatisfactory. Some of them are related to inefficient usage of statistical methods. In chemometrics for example the technical progress brought a wide variety of high-performance measurement instruments. These instruments yield complex multivariate data, and yet, it is still not uncommon to see the scientists performing uni-variate data analysis. By doing this they risk losing precious information.

Moreover, many models assume normality of the residuals (which in many cases is far from the reality) and are not resistant towards outliers (which are known to be more the rule than the exception for empirical data). That is the reason for robust methods being a valuable tool for both semi-automated detection of outliers and model selection process.

In this talk, based on my PhD thesis *robust procedures in chemometrics*, I will introduce theoretical background of robust statistics, together with some real life applications, and I will explain how this approach can empower any data analyst on their quest for excellence.

Papers:

Kotwa, Ewelina, et al. "Investigation of Arctic and Antarctic spatial and depth patterns of sea water in CTD profiles using chemometric data analysis." *Polar Science* 8.3 (2014): 242-254.

Kotwa, Ewelina, et al. "Automatic scatter detection in fluorescence landscapes by means of spherical principal component analysis." *Journal of Chemometrics* 27.1-2 (2013): 3-11.