



Multichannel NIR spectroscopy: A role model for future Quantitative Big Data

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The NIR spectroscopy community has set an example for how to convert the future's enormous amounts of raw data of various sorts into useful information. The creative open-mindedness and the professional, goal-oriented pragmatism that characterizes the NIR community allow good use of high-dimensional measurements: The diffuse NIR light measurements at each individual wavelength channel are precise enough, but highly non-selective: Many physical and chemical phenomena cause variations in the raw data. Yet, after suitable data preprocessing, multivariate calibration and graphical displays, the NIR measurements provide selective prediction of desired qualities, as well as good overviews of what is going on in the samples, and automatic detection of outliers and unexpected variation types.

Still, in my opinion there are many new methodological opportunities ahead for diffuse NIR spectroscopy:

- 1) Even better separation of the different causes for NIR variations.
 - 2) On-The-Fly compression of NIR spectra, to avoid large, cumbersome raw data files.
 - 3) Hyperspectral NIR video, to obtain spatiotemporal overview of complex dynamic systems.
 - 4) IDLE-modelling, to include spatiotemporal motion estimation and –compensation in NIR video.
 - 5) Dynamic modelling of complex processes: Mechanistic models developed from our NIR PCs.
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