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Editorial: Variable selection in chemometrics

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Editorial on the Research Topic Variable selection in chemometrics

In statistics, the term *variable selection* relates to a wide variety of computational approaches that have been commonly exploited all over the years in an attempt to solve the so-called *curse of dimensionality*, which usually hampers the use of most classical data analysis methodologies in many diverse practical situations typical of the modern Big Data era. Conversely, in chemometrics, variable selection has not played the same historical role owing to the fact that basically all the techniques conceived and developed in this particular domain directly allow complex sets of high-dimensional instrumental measurements to be processed without the need of preliminarily compressing them and reducing their size. However, recent technological advances—impacting especially the field of analytical chemistry—are bringing this subject back into the *chemometric spotlight* under slightly different perspectives. For example, today's spectroscopic platforms are constantly being adapted and/or miniaturised so as to enable also on-line or on-site applications and, in such circumstances, the design of simple, efficient, low-cost sensors spanning reduced, but informative ranges/subsets of wavelength channels are essential to guarantee a satisfactory characterisation performance. On another hand, mass spectrometers as well as hyperspectral cameras can nowadays deliver tons of GBs of data in very short times and *via* one-step sampling procedures. Often, though, only a smaller portion of such data actually encode the most useful and meaningful information required for tackling tasks like multivariate classification or linear unmixing¹.

In the light of all this, this Research Topic was originally proposed with the aim of gathering contributions from scientists working in different disciplines, but sharing common interests in the conceptualisation and utilisation of algorithmic strategies for variable selection. Two of such contributions have reviewed and compared some of the most popular existing tools devised for this purpose: [Armstrong et al.](#) focused specifically on variable selection when discrimination problems are dealt with, while [Westad and Marini](#) assessed to what extent the variables retained by means of these tools are relevant when it comes to interpreting predictive-type models. [Latchoumane et al.](#) have introduced the use of *N-CovSel* for the extraction of key features from front-face

1 For example, filtering out non-informative (noisy) regions of the recorded signal profiles may actually improve the performance of predictive models constructed on the measurements at hand.

fluorescence spectra recorded for differentiating healthy and diseased fruit products. Finally, López-Fornieles *et al.* have extended its algorithmic scheme for handling multispectral satellite image time series registered for remote sensing-based crop and plant growth monitoring.

Overall, as far as the editors are concerned, this Research Topic has undoubtedly permitted to stress the importance and relevance that variable selection can have in both basic and applied research scenarios.

Author contributions

RV wrote the first draft of the editorial. J-MR contributed to its revision. All the authors approved it for submission.

Conflict of interest

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