



“Multiple Instance Representation for tumor classification”

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Abstract

The availability of comprehensive pan-cancer mutation catalogues have opened the way for addressing an important goal in personalized cancer medicine, that is to determine an effective treatment strategy based on a patient's somatic mutation profile. To achieve this, it is necessary to establish clear relations between somatic mutations and cancer (sub)type or drug response.

Unfortunately, mutations are extremely sparse and heterogeneous so that clinically very similar samples often share only a minimum number of mutations. Typically, mutation profiles are used that summarise (impact of) mutations over the whole genome, potentially losing information of individual mutations. To exploit auxiliary information on the individual mutations in the training of the predictor, we propose to use the Multiple Instance Learning (MIL) framework. We envision future applications in early cancer diagnosis based on cell-free DNA in liquid biopsies such as blood or urine.

Short bio

David M.J. Tax studied physics at the University of Nijmegen, The Netherlands in 1996, and received Master degree with the thesis "Learning of structure by Many-take-all Neural Networks". After that he had his PhD at the Delft University of Technology in the Pattern Recognition group, under the supervision of R.P.W. Duin. In 2001 he promoted with the thesis 'One-class classification'. After working for two years as a Marie Curie Fellow in the Intelligent Data Analysis group in Berlin, at present he is assistant professor in the Pattern Recognition Laboratory at the Delft university of Technology.

His main research interest is in the learning and development of detection algorithms and (one-class) classifiers that optimize alternative performance criteria like ordering criteria using the Area under the ROC curve or a Precision-Recall graph. Furthermore, the problems concerning the representation of data, multiple instance learning, simple and elegant classifiers and the fair evaluation of methods have focus. Good representation, and suitable performance measures should not only lead to good classifiers, but should also help the user in understanding the problems that he is solving.

The lecture will take place **at 11.00 – Sala Verde – Cà Vignal – Strada Le Grazie, 15**

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