

Editorial

Meta-Machine-Learning in the Era of Automated Hypotheses Induction

As epitome for this issue of Transactions on Mass-Data Analysis of Images and Signals, we can say that Machine Learning for diagnosing medical tissues and substrata, will no longer be limited to confirming/refuting prior hypotheses, but also to derive new alternative hypotheses that had not been formulated by clinical experts before. In this sense we may even speak of “entering the era of meta-machine learning”. This is sensational as it is a real domain break-through of what has recently been shown in the stage of Alpha-Go; It completely surpassed the paradigm like in the two decades ago IBM computer chess project “Deep Blue”. Deep Blue conquered Kasparov due to a huge library of earlier ‘proven’ turns and successes. Alpha-Go undertook the game of Go that still lacked mid-game heuristics. Alpha-Go managed to ‘learn’ what rules obviously emerge when playing against itself. Similarly, we may expect that as extrapolation of the results from the two enclosed articles by Yosef Hasan Jbara and Alexander Bernstein with his colleagues, to-morrow’s research in pathology, anatomy and histology face scientific progress, based on the combination and longer-term analyses from heterogeneous types of feature extraction like prompted in “MRI brain imagery processing software in data analysis.” Its promising application is not only to excavate ‘hidden’ interactions and higher order dimensions in spatial substrate, but even prompt researchers to underlying mechanisms that might not have imagined by experts as we know them up to now. Crucial for further progress via ‘MRI brain imagery processing software in data analysis’ is the breadth of circumstantial data like the patients’ disposition (both genetic heritage, life style and the final medical prognosis and life expectancy), in order to have sufficient multi-level regression power for naming the detected patterns in the involved experimental subjects.

The article “Principal Component Analysis based Multimodal Medical Image Fusion of MR and CT using Wavelet Transform” preludes to an even more exciting next step in smart image interpretation; it is the situation that after a smart diagnostics (exceeding the interpretation by the human eye), the various medical interventions will be taking into account and help nurse practionners to optimize patient treatments much more quickly through minimal-invasive actions instead of waiting weeks or months as in the traditional one-shot try up to today. By smart detection of shifting substrata interactions at a very small scale, it will allow doctors to revise their initial approach in minutes, rather than weeks.

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In conclusion we might say that machine learning has taken over the paradigm of 'data-mining' and 'Bayesian' approach that strictly relied upon human's capacity to generate new plausible hypotheses. Of course, we need to be keen now on the 'dawn of meta machine learning' that forces us to learn very fast from the various trials and successes of evolving machine learning projects.

I am sure you will get even more fascinated about the increasing singularity to come, where not only the human as cognitive architect will need to progress; even further: human experts and the machine learning medical hypotheses will need to concertate seamlessly. May this journal play an ever more creative role in extending yesterday's imagination.

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