of reducing the need for data storage and enhancing the calculation speed, which were considered to provide a technical solution to a technical problem. In **T 505/18** the board decided, in line with **T 651/12**, to recognise improved safety in the technical context of the invention, that of real-time route guidance of a driver of a vehicle, as being a technical effect, and the considerations regarding improved safety in a vehicle navigation system as being technical considerations made by the technical expert in navigation systems.

e) Artificial Intelligence and Machine Learning

In **T 598/07** the invention concerned a heartbeat monitoring method, which was based on a neural network for the purpose of identifying irregular heartbeats. The board held that this made a technical contribution.

In **T 1286/09** the invention related generally to the field of digital image processing and, in particular, to a method for improving image classification by training a semantic classifier with a set of exemplar colour images, which represented "recomposed versions" of an exemplar image, in order to increase the diversity of training exemplars. The board found that it involved an inventive step.

In **T 1510/10** the invention concerned ranking information, particularly live web applications, based on interest and/or importance. The board had to consider whether using machine-learning algorithms could contribute to inventive step. The board highlighted that the claimed subject matter failed to define any particular method of machine learning – not even one was described in the application. Rather, machine learning was presented in the application as known. Thus, the Board decided that 'no inventive step can derive just from the use of machine learning. The Appeal was dismissed.

In **T 1285/10** the invention related to a genetic analysis computing system with a method for diagnosing and recommending treatment for a physiological condition using artificial intelligence. The board held that it was common ground that use of artificial intelligence generally was already known. It was the use of hybridization information from an array of peptide nucleic acid probes, which was in question. The board did not come to a decision on inventive step, but observed that the claims were obvious in the light of the prior art.

In **T 1784/06** the automatic classifying of abstract data records was held to be non-technical since the data records were classified for the non-technical purpose of billing. A valuable mathematical property of the algorithm could imply technical benefits but only when used for a technical purpose.

In **T 755/18** the board held that if neither the output of a machine-learning computer program nor the output's accuracy contributed to a technical effect, an improvement of the machine achieved automatically through supervised learning to generate a more accurate output was not in itself a technical effect.