AI Patents in the UK – Artificial Neural Networks Are Not Computer Programs

On 21 November 2023, the High Court of England and Wales issued a significant judgment in *Emotional Perception AI v Comptroller-General of Patents*[1] which represents a turning point for patentability of AI inventions in the UK. Sir Anthony Mann held that an artificial neural network (ANN) *per se* is *not* a computer program and therefore not excluded from patentability. Furthermore, a trained artificial neural network can provide a technical effect which prevents it from being excluded as a "program for a computer … as such".

The invention in suit relates to a system and method for providing data file recommendations, such as video, audio, image or text files. This is achieved by first training an artificial neural network to identify unlabelled data files that are semantically similar to one another and then using the trained artificial neural network to recommend, and provide to a user device, data files that are semantically similar to a target data file. At the UK IPO, the Hearing Officer held that at its core, this invention is merely a "data analysis and information retrieval task which involves the processing of data within the computer or the computer network" and that the artificial neural network-based system for providing semantically similar file recommendations is thus not technical in nature.

The Appeal

Although the first instance decision has treated hardware ANNs and emulated ANNs as equivalent, on appeal it was conceded by the IPO that a hardware ANN is not a computer program and the argument concerned mostly software or emulated ANNs. In his judgment, Sir Anthony Mann held that an emulated ANN should not be excluded as being a "program for a computer … as such" for two reasons. Both reasons rely on a definition of a computer program as a "set of instructions that made a computer do a particular thing".

Firstly, there is no program in the claimed ANN. In the appeal, both the training stage of the ANN and the subsequent internal training and operation stage of the ANN were considered. Although it was held that the initial training of the ANN does *involve* a computer program, there is no identifiable "set of instructions" in the subsequent internal training and operation stage of the ANN.

Although Sir Anthony Mann acknowledged that the structure of the ANN in terms of its emulation of uneducated nodes and layers may be the result of programming, the actual operation of those nodes and layers is not given to those elements by a human but is instead created by the ANN itself. Accordingly, it was held that the emulated ANN existed at a layer above the software platform which enabled the computer to carry out the invention. The ANN is not operating a set of program instructions but, instead, is

operating its own weights and biases to produce relevant vectors or co-ordinates. Sir Anthony Mann therefore held that there was no program at the point of the internal training and operation stage of the ANN because no person had given a set of instructions to the computer to do what it does.

Sir Anthony Mann concluded by stating that the claim goes beyond the claim features which could be considered to be programs of the ANN, namely, the training stage of the ANN. Instead, the claim calls for setting parameters based on a trained ANN, which is not necessarily part of the program. Therefore, the claim should not be excluded as being a "program for a computer … as such".

This judgment applies to both a hardware ANN and a software emulated ANN (both of which are within the scope of the claim) because it was held that software and hardware implementations are the same in terms of architecture, weights and biases, and the outputs produced. Choosing between one or the other is merely a question of which is more convenient or efficient to use.

Secondly, Sir Anthony Mann held that even if his first reason is wrong (i.e. even if the ANN were considered as a program), a technical effect is present in the claim because data to be recommended is moved/transferred outside of the computer system which provides an external effect. The judge draws parallels between the present case, in which a song that a user might enjoy is recommended, and an earlier High Court decision *Protecting Kids*, in which a "data communication analysis engine" was capable of detecting the undesirable use of computers by children by assessing the contents of data packets, assigning an alert level to those packages and sending the data packets to an adult if a target alert level was reached.

Sir Anthony Mann held that the present case is similar to *Protecting Kids* in that the purpose of the present case is to identify a file and then move it because it fulfilled certain criteria, and that the ANN has gone about its analysis and selection to fulfil that criteria in a technical way. This is because not "just any old file" is identified but instead, "it is a file identified as being semantically similar by the application of technical criteria which the system has worked out for itself [therefore] the output is of a file that would not otherwise be selected". Accordingly, it was held that even if one were to consider a trained ANN as a computer program, it should be regarded as having a technical effect which prevents the exclusion from applying.

The Outcome

The judgement has led the UK IPO to make an immediate change to practice for the examination of ANNs for excluded subject-matter. Patent Examiners should not object to inventions

involving an ANN under the "program for a computer" exclusion of section 1(2)(c). This provides an opportunity in which applicants of AI patent applications in the UK claiming an ANN might be able to successfully overcome a historically difficult objection at the UK IPO. The judgment applies to all types of artificial neural networks, the key being that they are artificial.

Detailed guidance on how this change to UK practice will apply to the plethora of pending and future AI applications is not yet available. However, the UK IPO stated on 29 November 2023 that the Manual of Patent Practice (MOPP), the UK equivalent of the EPO's Guidelines for Examination, will be updated to reflect the Emotional Perception judgment in due course[2].

In contrast to this, the European Patent Office (EPO) still rejects AI inventions that classify content depending on cognitive factors. The settled EPO approach (referred to as the Comvik approach) sets two hurdles for an invention to overcome. The first hurdle is overcome if the claim includes any technical feature. Reference to an artificial neural network could suffice. The second hurdle however is higher and requires that the technical features of the claim are inventive. A conventional artificial neural network does not overcome this hurdle. If the technical features of the claim are conventional, what they do must be examined for a technical inventive step. Sir Justice Mann does not appear to have applied the second hurdle. It is not yet clear whether the UK IPO will now submit the application to a detailed examination of novelty and inventive step.

Although historically the EPO has been much more friendly than the UK IPO to computer implemented inventions, following Emotional Perception the UK IPO might be more receptive than the EPO for some inventions.

1. *Emotional Perception AI Ltd. v Comptroller General of Patents, Designs and Trade Marks*, [2023] EWHC 2948 (Ch) 21 November 2023

2. https://www.gov.uk/government/publications/examination-of-patent-applications-involving-artificial-neural-networks/examination-of-patent-applications-involving-artificial-neural-networks-ann

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