Kluwer Patent Blog

An Emotional Roller-Coaster – the English Court of Appeal overturns the High Court on the Patentability of AI Inventions

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On 19 July 2024, the Court of Appeal handed down its judgment in *Comptroller – General of Patents, Designs and Trade Marks v Emotional Perception AI Limited [2024] EWCA Civ 825* following a hearing on 14-15 May 2024. The Court of Appeal judgment overturns the first instance decision of the High Court and upholds the findings of the UKIPO Hearing Officer.

As discussed in a previous Kluwer article, Emotional Perception's patent application for an AI music recommendation neural network was refused by UKIPO as a computer program "as such", and therefore excluded from patentability under s.1(2) of the Patents Act 1977. The High Court overturned this decision in November 2023. But the English Court of Appeal has reversed it again, in line with the view of the UKIPO Hearing Officer.

The Law

Since 2007, the UKIPO has followed the test set out in *Aerotel* to determine whether an invention relates to excluded subject matter under s.1(2). This test involves the following steps:

1. Properly construe the claim;
2. Identify the actual contribution;
3. Ask whether it falls solely within the excluded subject matter;
4. Check whether the actual or alleged contribution is actually technical in nature.

Aerotel steps 1) to 3) – is an ANN a computer program as such?

The first task for the Court of Appeal was to decide whether Emotional Perception's Artificial Neural Network (ANN) fell within the definition of "a computer program".

Birss LJ stated that a computer program could be defined as "*a set of instructions for a computer to do something*", with a computer defined as "*a machine which processes information*" (see paragraphs [0061] and [0068]). This definition is similar to that adopted by the UKIPO during the hearing, and the previous findings of the Court of Appeal in *Aerotel*, where a computer program was described as being a "set of instructions" (see [0115] of that judgment).

Emotional Perception argued that its ANN was not a computer program, due to the configuration of ANNs (e.g. its weights for the artificial neurons) compared to standard computer programs. However, in applying the above definition of a computer program, Birss LJ rejected this and found

that an ANN is "*clearly a computer – it is a machine for processing information*" regardless of how it is implemented, see [0068] and [0070]). This conclusion was justified through the following reasoning.

On the issue of weights in an ANN, Birss LJ stated the following:

"They are a set of instructions for a computer to do something. For a given machine, a different set of weights will cause the machine to process information in a different way. The fact the set does not take the form of a logical series of 'if-then' type statements is irrelevant. The weights for a given artificial neuron are what cause the neuron, if the inputs are of a given type, to then produce an output of a given type. Aggregated up to the ANN as a whole, these weights work that way in parallel with one another to a significant extent and not just in a logical series, but that is not a relevant distinction. The set of weights as a whole instruct the machine to process information it is presented with in a particular way."

This is in line with the EPO's approach in T 702/20 *Mitsubishi/Sparsely connected neural network* at [10] and [11].

The fact that the the weights were not configured by a human programmer and rather through training was not considered to make a difference, with Birss LJ noting that even the final form of standard computer programs is computer-generated to some extent, due to conversion of human-written code to computer code during compilation (see [0064]).

Furthermore, the fact that ANNs "*aim to solve problems which are not easy to solve with conventional computers"* was deemed irrelevant, as conventional computers and ANNs can (aim to) solve problems which are difficult for humans to solve unaided.

Permanence of the weights was also found to make no difference, with Birss LJ stating "*Whether the program for a given computer is fixed in a permanent form or not does not, in my judgment, alter the fact that the program represents a set of instructions for a computer to do something*".

The Court of Appeal therefore found that the claimed ANN was still a set of instructions for a computer to do something, falling under the exclusion of a "computer program… as such" in accordance with s.1(2) of the Patents Act 1977.

Aerotel step 4) – Technical Contribution

With the finding that Emotional Perception ANN was a computer program, the Court of Appeal then proceeded to step 4) of the *Aerotel* test to decide whether it was nevertheless patentable by its technical contribution.

In each of the hearings before the UKIPO, High Court, and Court of Appeal, the contribution made by Emotional Perception's invention had been construed as:

"*…an ANN-based system for providing improved file recommendations… The fundamental insight is in the training of the ANN which analyses the physical properties of the file by pairwise comparisons of training files. In these pairwise comparisons the distance in property space between the output (property) vectors of the ANN is converged to reflect the differences in semantic space between the semantic vectors of each pair of files. The result is that in the trained ANN, files clustered close together in property space will in fact have similar semantic*

characteristics, and those far apart in property space will have dissimilar semantic characteristics. Once trained the trained ANN can then be used to identify, swiftly and accurately, files from a database which correspond semantically to a target file, and to provide… file recommendations to a user device…"

In considering technical contribution, the Court of Appeal found the features of how the claimed ANN was created (i.e. training), was just "*in effect, part of the creation of the program*" and did not form part of the technical contribution. Other than the output of the ANN (sending a recommended file to a user device) the remainder of the contribution was therefore found to consist of a computer program.

In relation to the output of the ANN it was found that this was simply "the presentation of information" (another exclusion under s.1(2)) and therefore unpatentable. This was because it was found that the improvement of the recommendation was based on semantic qualities (i.e. a matter of aesthetics or, in the language used by the Hearing Officer, subjective and cognitive in nature) rather than technical ones. The output therefore does not turn the claimed invention into a system which produces a technical effect outside of excluded subject matter (see [0079] and [0081]). Accordingly, the claimed invention was unpatentable.

What does the future hold for AI inventions in the UK?

The decision ends a period of divergence in the UK from the approach of the EPO. Whilst some had hoped the UKIPO would continue to be more permissive in assessing the patentability of inventions relating to ANNs we will likely now return to an approach where inventions utilizing an ANN *may* be patentable, but should be assessed in the same way as any other computer-implemented invention.

Following this decision, the UKIPO suspended its previous guidance on the examination of patent applications relating to artificial intelligence. On 25 July 2024 the UKIPO issued new guidance, making it clear that examiners should treat ANN-implemented inventions like any other computer implemented invention for the purposes of s.1(2). This means examiners should apply the *Aerotel* approach to assess whether an ANN-implemented invention makes a contribution which is technical in nature.

Emotional Perception has indicated that it plans to appeal the decision to the Supreme Court and we will follow the development of any such appeal closely.

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