



Protecting AI devices: it's a dog eat dog world

We consider the ways in which innovators can protect their inventions in AI related technology

Artificial intelligence is revolutionising every aspect of our lives, from how we order food to how new drugs are developed. With companies from all sectors investing in AI related technology at breakneck speed, an ongoing question is how innovators can protect their inventions.

The current situation in the US presents uncertainties when it comes to patenting AI-related technology following the Supreme Court's decision in *Alice Corp v CLS Bank*, and the law covering other aspects of AI is equally complex. In the UK, protecting AI-related technology involves a range of considerations, from the case law of the European Patent Office (EPO) relating to computer implemented inventions, to UK domestic laws involving other forms of protection such as copyright and trade secrets. With innovation currently outpacing the law, where does that leave innovators? To explore this further, we have analysed a hypothetical example to shed some light on the current landscape.

Dog eat dog: A hypothetical example

In this hypothetical example, DogAI is a small European company which produces a product called the Ruffcam, which has been selling very well since its launch six months ago. The Ruffcam is a webcam device which, when sensing that a dog is stressed, plays recordings of the owner's voice to alleviate the dog's stress. DogAI spent three years developing the product and the process consisted of:

- Carrying out a behavioural study using videos of dogs which revealed that howling is a good indicator of dog stress levels

- Using OpenCV (a known computer vision library) to identify and track the dogs in the videos
- Combining the processed video results into a database with the times of the howling
- Training a neural network using the database to produce a trained neural network that estimates when howling events are about to happen
- Incorporating the neural network into a webcam along with recordings of the owner's voice and OpenCV

DogAI's head researcher left the company a few months after the launch of the Ruffcam to join a European competitor called Cotbot. Cotbot had previously specialised in baby monitors but, within a month of the head researcher joining, Cotbot had produced a webcam device for dog owners which was extremely similar to the Ruffcam. DogAI believe their trained neural network, training method, or database must have been used to produce such a similar product so quickly.

The question is: could patents have helped protect DogAI's invention?

Could aspects of Ruffcam have been patented?

In order to assess the patentability of the Ruffcam, it is essential to first consider the different stages of the development process:

- Process 1: processing the video with the computer vision library to extract the tracking data



- Process 2: forming the tracking data and howling timing information into a database, and conditioning the database to remove outliers
- Process 3: taking the conditioned database and using it to train a neural network
- Process 4: adding the trained neural network into a webcam

Next, we need to consider what prior art is in existence which might impact the patentability of the different processes. Research reveals that:

1. There are other products of a similar nature on the market such as Furbo; a dog webcam which uses a different form of AI technology to learn a dog's behaviour. The Furbo also plays an owner's voice when dispensing treats.
2. An article from 2017 states that a particular type of neural network has been used to analyse GPS tracks to accurately predict when seabirds will dive for food. The neural network is the same as the one used by the Ruffcam.
3. There is an online development project called GoTurn which uses OpenCV to track animals from webcam images.

With this prior art in mind, are any of the four processes patentable? Extracting tracking data from webcams is covered by prior art and so the first process would not be patentable. Similarly, the forming of a database in the second process and the training of a neural network in the third process would not be patentable in isolation.

Crucially, if an application was specified, it is possible that processes two and three might be protectable. If, for example, application of generating a neural network to predict animal behaviour from a webcam was specified, or if an unusual database format, or odd data conditioning, was crucial to forming the neural network then the second process might be patentable. Similarly, if the application was again specified and the training was complex (by requiring very specific parameters) the third process may be patentable. The EPO's patent examination guidelines have recently been updated to highlight this crucial point that technical applications of AI may avoid the bar on patentability of "mathematical methods" (EPO Guidelines G-II, 3.3.1). However, assuming this bar is overcome, since the same AI was trained in the second piece of prior art to predict behaviour from the sea bird tracks, it is likely that the second and third processes would lack an inventive step unless the application is narrowly defined.

Process four is potentially patentable because the trained AI has a specific technical purpose based on a technical solution to a technical problem; in this case the purpose is that the Ruffcam only plays the recordings at appropriate times (when the dog is stressed), thereby providing a solution to the technical problem of how to reduce or minimise additional noise. While the technology is similar to that used in the Furbo, the Ruffcam also required the particular AI from the second prior art and use of OpenCV from the third prior art. At the EPO, an invention requiring a mosaic of three prior arts is more likely to be considered inventive and so the fourth process would potentially be patentable.

In summary, in light of the prior art, it seems that DogAI may have been able to protect processes two, three and four at the EPO, but would they have been able to enforce them against Cotbot?

Enforcement – could DogAI have its day (in court)?

A general principle of trained AI operation is that the underlying trend ascertained from the training data can be applied more broadly. Therefore, another training data and possibly another training method would likely have eventually uncovered the same trend. It is therefore very likely that deducing the input (or training) data, or the training method, by analysis of the final AI product is practically impossible.

Identifying whether a protected trained neural network is in the final product is a challenge. It depends on a range of factors, including how the neural network is embedded, optimized or obfuscated. It could well be impossible to tell whether a particular trained neural network is present.

Then there is the issue of Cotbot's previous product; the baby monitor that foreshadowed a baby's cry. Generally, an application must demonstrate inventive step to secure approval at the EPO; this may have required DogAI to narrow its claims to a dog monitoring webcam. Whether the claim could cover baby monitoring under the doctrine of equivalents is uncertain.

While these challenges certainly hamper the prospect of enforcement, there may be other tools which DogAI has to its advantage. Promotional materials or instructions may simply admit to using claimed features, for example Cotbot might advertise their product as the first baby monitor powered by a neural network.



Also, crucially, if it was possible to gain disclosure and review the development notes, it may be possible to find evidence of infringement if it existed. With these additional tools, patents may be a viable option, but they would not offer perfect protection in this scenario.

What about other forms of IP?

Given the challenges of obtaining and enforcing these patents, it is worth considering other forms of IP which could offer effective protection.

Trade secrets or confidential information

In order to protect an innovation using trade secrets or confidential information, there are three requirements: information must have the necessary quality of confidence; it must have been imparted in circumstances importing an obligation of confidence and there must be an unauthorised use of that information to the detriment of the party communicating it.

All four processes are likely protectable under these criteria which are less exacting than the EPO's patentability requirements. However, as with the patents, enforcement is likely to throw up challenges since it requires showing that the defendant is performing the trade secret. Again, if a prima facie case can be established, then disclosure of the defendant's development process in the course of litigation may provide crucial evidence.

Copyright

There are five requirements to protect an innovation under copyright: it must be a recognised category of work; the work must be original; the work must be fixed in a tangible medium; the author must be a qualifying person or there must be a qualifying publication and the person asserting the copyright must own the work. The key requirement is "originality", which requires that the author of the work was able to (and did) exercise creative choices whilst creating the work. In light of these criteria, the second and third processes could be protectable as literary work, but the first process and fourth process, which are essentially routine, are unlikely to be protected due to lack of originality. Again, the enforcement issues are likely to be similar to patents or trade secrets.

Database right

This is a sui generis right which protects the investment in the creation of databases, rather than the creation of the data itself. Databases are defined as:

"A collection of independent works, data or other materials; arranged in a systematic or methodical way; and individually accessible by electronic or other means."

A database is protected if the maker made substantial investment, whether human, technical or financial in obtaining, verifying or presenting the contents of that database. A database right would provide the exclusive right of copying or extracting data from the database.

Given these requirements, the second process may be protectable since it refers to the data being refined in a systematic or methodical way and individually accessible. However, the first process would not be protectable since it's not arranged in a "systematic or methodical way" and it is doubtful that the third or fourth process would be protectable since they would not be "individually accessible" (rather, they are "accessed" when the dog exhibits certain behaviour).

What is the best strategy?

As well as the difficulties already discussed with enforcing patents, there may also be reasons not to seek patent protection for AI inventions in the first place, not least because a detailed patent specification can provide competitors with an easy means of copying the technology.

For that reason, trade secrets and copyright can often offer better protection as these forms of IP avoid the need to meet the EPO's inventive step requirements and confer protection without having to make a public disclosure by way of a patent application.

On the other hand, not patenting your invention could leave a company at risk of being sued under future patents filed by competitors, which means CotBot could in fact sue DogAI. In such a scenario, DogAI would need to have clearly documented its own development process to show that this had pre-dated CotBot's patents, but even if this were a successful defence, DogAI may be precluded from developing its technology to within the scope of CotBot's patents.



In our hypothetical example, both patent protection and trade secrets or copyright would be appropriate and complementary. The fundamental concepts could be patent protected, while the additional elements required for a commercial product, such as the specific proprietary data and the trained neural network, could be protected by trade secrets or copyright.

It is also important to remember that there are other rights which Cotbot may have infringed in this scenario through the presentation and packaging of its commercial product, such as UK unregistered design rights, community unregistered design rights, registered designs, trade marks/passing off and breach of contract. If DogAI were to invoke these rights they could potentially bring Cotbot to a commercial agreement or secure disclosure on copying.

Summary - it's a dog eat dog world

The example of DogAI hopefully goes some way to highlighting the complexities of protecting an AI device but it is not all doom and gloom. There are a number of different options available for protecting IP and, as in this example, a blend of different approaches will often offer the most comprehensive protection. By working with an IP professional in the early stages of development, companies like DogAI can put in place effective IP strategies which will protect their innovations in the long term.

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Need advice?

Carpmaels & Ransford is a leading European IP firm based in London. For more information about our firm and our practice, please visit our website at: www.carpmaels.com.

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