Emotional Perception AI - Fundamental Definitions

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1. Introduction

The early years of computing saw the rise of general-purpose computers, wherein a single device could be used to balance budgets, write stories and watch videos. This was precipitated by the smartphone revolution where again a single device replaced *inter alia* the calculator, flashlight, calendar and the Rolodex. With the commoditization of hardware, the trend is now shifting towards specialized devices used in cases where performance or security is of concern, for example, chips in credit cards which only perform cryptographic operations. However, this has led to questions on what can be considered a computer.

Emotional Perception AI Limited (EPAIL) developed an Artificial Neural Network (ANN) implemented in hardware which is capable of analyzing music files and recommending similar music [1]. The nexus of the case centres on EPAIL's claims that the ANN is not a computer program and hence eligible for patent protection even without "substantive technical contribution" [2]. In this essay, I will attempt to justify why the weights of the ANN should be considered a computer program, and answer the resultant question about whether the EPAIL's ANN should be eligible for patent protection under the eligibility carve-out for computer programs. I will also explore the issues caused by the "technical contribution" approach used by the courts and explain why the decision may not have much impact on the software landscape.

2. Definition of a Computer Program

EPAIL claims that the weights of both hardware and software ANN should not be considered computer programs because the programming was not performed by a human [3] and did not take the form of "if-then" statements defining its function [4]. The court disagreed with the claim, stating that since the weights of an ANN instructed the ANN to "process information in a particular way", it constitutes a computer program [5]. Furthermore, even in the case of conventional computer programs, the machine code running on the computer is compiled from source code and not directly written by a hu-

1 *Comptroller - General of Patents, Designs and Trade Marks and Emotional Perception AI Limited* [2024] EWCA Civ 825, para. 2

2 *Comptroller - General of Patents, Designs and Trade Marks and Emotional Perception AI Limited* (n 1), para. 41

3 *Comptroller - General of Patents, Designs and Trade Marks and Emotional Perception AI Limited* (n 1), para. 42

4 *Comptroller - General of Patents, Designs and Trade Marks and Emotional Perception AI Limited* (n 1), para. 58

5 *Comptroller - General of Patents, Designs and Trade Marks and Emotional Perception AI Limited* (n 1), para. 61

man, hence EPAIL's argument is not valid [6]. I agree with the court's opinion, there are numerous no-code application builders such as Adalo and Thunkable which allow users to drag and drop components to create apps [7] [8]. In the background, the ordering and position of these components are converted into object code. Given that the object code generated by no-code application builders is extremely similar to that generated from source code, it is logical to conclude they should also be considered computer programs. The use of the term "weights" probably elicits images of a handful of settings that could be modified. That could not be further from the truth. Leading neural networks have up to 175 billion weights [9], the range of its vocabulary and expressiveness easily rivals that of code, and hence could be considered another form of code. To use an analogy, three light emitting diodes (LEDs) in a traffic light may only convey stop or go, but 24 million LEDs arranged in a grid pattern in a TV [10] can not only display paragraphs of text but also crystal clear images. Nicholls argues that such a definition is problematic because any new neural network architecture would be considered a new computer and any new values for an electronic circuit would be considered a new program [11]. Nonetheless, the Patents Act requires the presence of an "inventive step" for a patent to be granted [12], I do not believe that the minor tweaks suggested by Nicholls would qualify. The traffic light in our earlier analogy could be considered a computer program, since the lights serve as instructions to a machine, a human in this case, which processes the information and decides to stop or go [13]. However, since it has already been patented [14], minor tweaks such as changing the timing of the signal should not qualify for a new patent.

3. Technical Contribution as Grounds

Given that we accept that the weights of an ANN is a computer program, the argument now shifts to whether it's contribution is technical in nature and could benefit from the eligibility carve-out defined in Aerotel [15]. The court stated that a technical method was used to achieve a subjective or cognitive effect, and thus does not qualify as a technical contribution [16]. The court

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6 *Comptroller - General of Patents, Designs and Trade Marks and Emotional Perception AI Limited* (n 1), para. 64

7 thunkable, 'Build Custom Mobile Apps No Coding Required' <https://thunkable.com/> accessed 10 February 2025

8 Adalo, 'Build a Mobile App for Your Business — No Coding Required' <https://www.adalo.com/> accessed 10 February 2025

9 Dataiku, 'Driving Enterprise Transformation With Generative AI' <https://www.dataiku.com/stories/detail/generative-ai/> accessed 10 February 2025

10 Scharon Harding, 'An update on highly anticipated—and elusive—Micro LED displays' <https://arstechnica.com/gadgets/2025/02/an-update-on-highly-anticipated-and-elusive-micro-led-displays/> accessed 18 February 2025

11 Daniel Lewis Nicholls, 'Emotional Perception AI and the Absurdities that Result' (19 July 2024) <https://whereistheprogram.wordpress.com/2024/07/19/emotional-perception-ai-and-the-absurdities-that-result/> accessed 10 February 2025

12 Patents Act 1977, para. 1(b)

13 *Comptroller - General of Patents, Designs and Trade Marks and Emotional Perception AI Limited* (n 1), para. 61

14 United States Patent and Trademark Office, *Traffic signal* (2015) <https://patents.google.com/patent/US1475024A/en>

15 *Aerotel Ltd v Telco Holdings Ltd; Re Macrossan's Application* [2006] EWCA Civ 1371, para. 40

16 *Comptroller - General of Patents, Designs and Trade Marks and Emotional Perception AI Limited* (n 1), para. 79 and 80

also stated that the ANN itself did not produce an effect in the real world as a file would still be sent to the user, albeit a less relevant one, even without the ANN [17]. The courts are probably bound by *stare decisis* to adopt the technical contribution approach, however it raises many issues. Li posits that such a method may result in "subjective conclusions" as it is based on prior art uncovered by searchers with varying skills [18]. Apart from that, technical contributions could be subjective as well. For example, the European patent for a Smart Lock extols the convenience of an automatically unlocked door when the user is detected via a nearby Bluetooth or Wifi device [19]. Is added convenience a technical effect, or does a technical effect need to be quantified in measurable terms like speed or accuracy? Given that it may take a few seconds for the user's device to connect to Bluetooth, it may not be faster than inserting a key into the lock. That said, I am in agreement with the court's point that the ANN did not have a "real world" effect. Outputting messages, displaying data visually or aurally would be expected from a computer, as evidenced from the wide range of media players and streaming applications available. Borrowing from the previous example, unlocking a door would be a novel application that is external to the computer.

4. Policy Implications of the decision

Bently *et al.* observed that the European Patent Office (EPO) has ceased using the "technical contribution" approach around the 2000s in favour of the "any hardware" approach [20]. This has resulted in a divergence that has been criticized as "irreconcilable" by the European Patent Convention (EPC) [21]. Thus, the continued usage by the UK courts would lead to further fragmentation of the software patent landscape and an increase in forum shopping by prospective registrants. González views patents as "a contract between inventors and society" [22], thus any such uncertainty may lead to decreased incentive to invest in developing novel software solutions, and subsequently to society's detriment.

However, not all is lost as copyright and trade secrets can still be relied upon to protect software. Competitors will need to study the functionality of the software and re-implement it from scratch to avoid copyright infringement [23]. Since EPAIL intends to provide music recommendation over the Internet as a service [24], it presents as an additional hurdle to competitors who do not even have access to the software. In such cases, trade secrets can be employed to protect the software from employees with access to it. Furthermore, a report to the European Parliament on software patentability found no evidence that software development

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17 *Comptroller - General of Patents, Designs and Trade Marks and Emotional Perception AI Limited* (n 1), para. 77

18 Yahong Li, 'The Current Dilemma and Future of Software Patenting' (2019) 50(7) International Review of Intellectual Property and Competition Law 823, pp. 836

19 European Patent Office, *A Smart Lock, System and Method* (2020) <https://data.epo.org/publication-server/rest/v1.0/publication-dates/20200513/patents/EP3350392NWB1/document.pdf>, pp. 10

20 Lionel Bently and Brad Sherman, *Intellectual Property Law* (6th, 2022), pp. 455

21 *Decision of Technical Board of Appeal 3.5.01 dated 15 November 2006 T 154/04 - 3.5.01* T-154/04, para. 13

22 Andrés Guadamuz González, 'The Software Patent Debate' (2006) 1 Journal of Intellectual Property Law & Practice 196, pp. 202

23 Noam Shemtov, *Beyond the Code: Protection of Non-Textual Features of Software* (1st, 2017), sect. 4.3.3

24 *Comptroller - General of Patents, Designs and Trade Marks and Emotional Perception AI Limited* (n 1), para. 2

was discouraged by the lack of patents and even suggested that patents may "stifle innovation [...] by creating monopolies in core innovations" [25]. Apart from truly groundbreaking innovations which I will explore in the next paragraph, the UK court's decision might not have much policy impact as most companies seem to be satisfied with the protection offered by copyright and trade secrets.

Additionally, the court's decision to adopt a relaxed generic definition of a computer and a computer program is forward-looking and will ensure that patents continue to protect upcoming innovations, such as a hardware wallet for storing bitcoin and authorizing transactions [26] or the aforementioned smart lock. In the much longer horizon, the position of atoms might satisfy the definition of a quantum computer program [27] while the specially engineered genetic sequence of a strand of bacteria might be considered a biological computer program [28]. It is of paramount importance that such breakthroughs fall within the patent framework and that scientists are recognized for their contribution.

5. Conclusion

In summary, I believe the Court of Appeal's decision to classify the weights of an ANN as a computer program is sound. The decision to adopt a more encompassing definition is also future looking. I also support the court's finding that the ANN did not produce a real world effect. Hence, I would expect the Supreme Court to uphold the judgment. I do not think the judgment will have a noticeable impact on most decisions to develop software. While I agree with the outcome, I feel that the Supreme Court should use a different approach that is in harmony with the approach used by the EPO. Nonetheless, I fully respect the eventual decision of the Supreme Court. This essay has been written for an academic assignment with a stipulated topic and is by no means an attempt at *Sub Judice*.

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25 European Parliament, *The patentability of computer programmes* (2002) <https://www.europarl.europa.eu/meetdocs/committees/juri/20020619/SoftwarePatent.pub.pdf>, pp. 18-19

26 United States Patent and Trademark Office, *Hot wallet for holding bitcoin* (2015) <https://patents.google.com/patent/US20150262176A1/en>, pp. 455

27 Josh Schnedider, 'What is quantum computing?' <https://www.ibm.com/think/topics/quantum-computing> accessed 10 February 2025

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