

Is the EU exposed on the copyright of robot creations?



Madeleine de Cock Buning

Some robots are capable of designing software programmes and even (although this will be disputed) of contributing to the creation of works of art. But, under current laws, such works may not have copyright protection in the EU. Madeleine de Cock Buning is Professor of Media, Communication & Copyright Law in The Netherlands and also works at the Centre for Access to and Acceptance of Autonomous Intelligence (CAAAI.eu). She discusses some of the copyright issues relating to works created by robots with Neasa MacErlean.

How important is it to start addressing now the issues of ownership of works created by robots, AI systems and other forms of robotics? How much is at stake from a commercial perspective?

It's very important. This is the right time to start thinking about the IP (Intellectual Property) issues. Rights can be very valuable, as can be the output. More and more robotics and Autonomous Intelligent Systems (AIS) systems are now able to create or invent. Recent advancing technology in the domain of AIS has led to machines that are capable of learning and creating. Although creativity is a property that is traditionally reserved as a human value, the advancement in the level of complexity of AIS seems to be making human intervention in the process of machine creation more and more redundant. Some of these systems are able to create works of authorship, software and some are even capable of inventing better versions of themselves.

Let me mention a few examples:

Researchers in Cambridge and Zurich recently developed a robotic system that can evolve and improve its performance. The robot learns to build a better version of a simple "baby robot", consisting of plastic cubes with a motor inside, each time it attempts the process. The mother robot assesses how far its babies are able to move and – with no human intervention – improves the design so that the next one it builds can move further. The mother robot has built ten generations of children, with the final version moving twice the distance of the first before its power ran out. The work is published in the journal PLOS One1 The researchers want to develop robots that are capable of innovation and creativity.

In May this year, two scientists from

the University of Tokyo published a paper² in which they introduced an algorithm that can reconstruct – or create – an image based on a "Bag-of-Visual-Words", a technique whereby images are dissected into groups of pixels that are given a visual word. Google uses this technique to sort through images. The two scientists turned this process around, constructing images from different words. The algorithm managed to reconstruct images, but was also able to create entirely new images based on descriptions such as 'boat on a beach' or 'bus on a field', although the images are not yet very clear.³

*The Painting Fool*⁴, developed by Simon Colton challenges our perception of creativity as a human quality.⁵ Colton aims to research whether software can be accepted as creative in its own right.⁶ In an exhibition called "You Can't Know my Mind"⁷, a program painted portraits of the visitors. The portraits were influenced by the 'mood' the program was in, which in turn was influenced by newspaper articles it had read that day. If the newspaper articles were generally positive, the atmosphere of the painting would be positive (more vibrant colors); if the newspaper articles were negative, the painting would be gloomy. On some occasions, the program was in such a bad mood, it actually refused to paint. The program sets itself a goal at the start, and attempts to achieve that with the painting styles it has. After completing the painting, the software self-assesses to see whether it has achieved the goal it set itself.

It is therefore very important to address these issues now. Not too early, not too late. When robots are functioning autonomously, the whole IP area has to be re-evaluated because,

under current rules, there has to be human influence in the output. If there is no human influence, there is no copyright protection.

What is the current situation regarding ownership of works created by robots? How much does it vary from country to country?

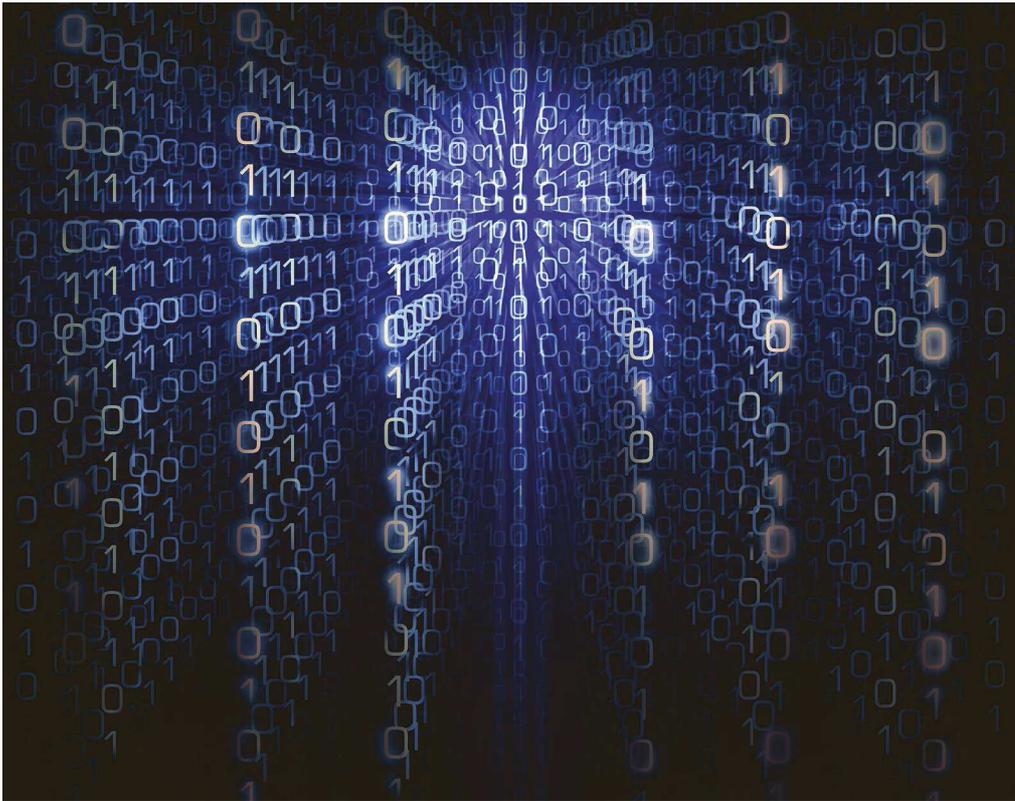
Obstacles arise immediately if a creator or inventor is an AIS rather than a human being. Questions arise both as to the protectability of independent autonomous creations against plagiarism and as regards the ownership of rights for such works. For instance, what are the legal requirements for copyright protection of a robot creation? And who would be the owner of such work? Since various European directives have over the years largely harmonized the national IP regimes, the European legislative framework and the case law of the European Court of Justice (ECJ) are the main sources for answering these questions. In line with the ECJ decisions on the Infopaq case, the threshold of protection for copyright is harmonized by the requirement that the authors own intellectual creation: this implies the need for human authorship. Also, some form of human authorship can probably be established in the current AIS output since these systems do not yet constitute fully autonomous, general-purpose artificial intelligent creative agents - as they lack the complete planning capabilities that would be needed and the capacity to start initiatives from scratch. Developments are going very fast, however, as the examples I mentioned show.

In so far as (partial) human authorship is involved in the creation of works, the ownership of them will vary from country to country since rights ownership is not harmonized within the EU. It can either be the creator of the software who is deemed the owner of the rights; or it could be the owner of the software; or it could be both. It can also be the entity or person who invested financially in the software. This topic leads to very complex ownership questions. New rights can however not be created by national states since copyright belongs to the *acquis communautaire* as confirmed by the CJEU (European Court of Justice) in the Football Dataco case.

Could the EU lose out to other jurisdictions because of the uncertainties over copyright?

The threshold for copyright is lower

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in the US. So it will be easier to protect anything which is created (partially) autonomously in the US. That puts the US at an advantage. This situation could be an incentive for Europe to start protecting these works. IP is largely harmonised in Europe but, for instance, the ownership aspect is not harmonised. It would be better if we could deal with it in a harmonised way.

Your organisation specialises in this area. What do you do? What are you looking for?

At our organisation, the Centre for Access to and Acceptance of Autonomous Intelligence (CAAALeu), we are working at the forefront of the interface between law and disruptive technology. We answer questions from industry and from Brussels. We focus on the constant need to evaluate the law as it is affected or overtaken by developing technology. We are looking at models for optimization of the legal framework by answering questions such as; is innovation hindered because the law is being left behind? Are authors and inventors provided with enough incentives to create and invent? Are consumer interests being sufficiently protected? All these aspects have to be considered for consumer acceptance of and full access to these technologies which are extremely valuable for society.

What would be the best way of resolving the issue? Should robots themselves

be given rights to own their works - or should it be the owners of the robots?

That is a good question with no easy answer. Generally speaking adaptation of the legal framework to the introduction of disruptive technologies has become an ever larger challenge because change is happening so quickly. It is important not to legislate before the technology is sufficiently developed because you can easily get things wrong and we want to avoid innovation being blocked by legislation. But we have had more than just a glance at this new technology. Furthermore, we can learn from earlier developments in law caused by the introduction of technology. This is especially true for copyright. Think of the introduction of photography and software within the copyright framework. What we will see is that after the importance of copyright protection is first generally denied, with the coming of economically valuable output of AIS there will be a lobby

for its protection. When this moment arrives we will be better placed to come up with sound ideas for protection regimes and to avoid the difficulties of correcting mistakes as were made with the introduction of photography where unfounded exemptions were made that denied the full potential of photography. If we do not want to rush to legislate then contract law, self-regulation and case law are becoming relevant as never before. In my view, European and national legislators should build on technology neutral laws that are primary designed to guarantee fundamental rights, striking a balance between intellectual property protection, consumer privacy and freedom of expression and innovation.

And please note that should we want to give robots rights, they should be legal entities. And there is a long way to go before we will be there. Before that, we should question whether protection is needed or not and how this relates to the foundations of copyright. Do robots need incentives to create? Would it be unfair or unreasonable not to grant them rights? These are the foundations to copyright protection. We could also imagine that other IP rights - such as patent rights or database rights - can play a role here. We should also consider a sui generis right such as a database right that protects the inventor and/or patent protection of the robot.

Could there be tax implications in the future based on the decisions made now? For instance, many large companies have based their HQs in jurisdictions such as Luxembourg because of the tax advantages.

Yes. Tax implications are always relevant as regards the establishment of entities. It is not just Luxembourg that has tax advantages, of course. Large media companies such as Netflix are established in The Netherlands because of regulatory reasons as well as for the tax advantages. It could also be that the strong tradition in IP law could be an advantage of establishment in the Netherlands, let alone the beauty of our capital Amsterdam!

Footnotes

- 1 Brodbeck L, Hauser S, Iida F (2015) Morphological Evolution of Physical Robots through Model-Free Phenotype Development. *PLoS ONE* 10(6): e0128444. doi:10.1371/journal.pone.0128444.
- 2 Hiroharu Kato & Tatsuya Harada, 'Image Reconstruction from Bag-of-Visual-Words', <http://arxiv.org/pdf/1505.05190v1.pdf> (hereinafter Kato & Harada 2015), last visited on 04-06-2015.
- 3 Kato & Harada 2015, p. 11.
- 4 See: <http://www.thepaintingfool.com/index.html>, last visited on 08-06-2015
- 5 Simon Colton, 'Creativity Versus the Perception of Creativity in Computational Systems', http://www.thepaintingfool.com/papers/colton_aaai08symp.pdf (hereinafter Colton 2008), last visited on 08-06-2015.
- 6 'Artificial artists: when computers become creative', *Wired* 07-08-2013, <http://www.wired.co.uk/news/archive/2013-08/07/computers-be-creative/viewgallery/306906>, last visited on 08-06-2015.
- 7 See http://www.thepaintingfool.com/galleries/you_cant_know_my_mind/ for examples of its work.