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The Maker Movement: Copyright Law, Remix Culture, and 3D Printing

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I INTRODUCTION

3D printing is a process of making physical objects from three-dimensional digital models.¹ 3D printing is a form of additive manufacturing – rather than a traditional form of subtractive manufacturing. 3D printing is a disruptive technology, which promises to transform art and design, science and manufacturing, and the digital economy.

The Minister for Industry, Innovation and Science, the Hon. Christopher Pyne, has highlighted the key role of 3D printing for manufacturing and material science in Australia: 'Manufacturing remains a key driver in our economy, but as the industrial landscape changes, the sector needs to transition to more innovative and economically viable technology.'² Pyne stressed: 'Emerging technologies such as metal 3D printing offer huge productivity gains and have the potential to turn Australia's manufacturing industry on its head.'³ Likewise,

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¹ Anna Kaziunas France, *Make: 3D Printing. The Essential Guide to 3D Printers* (Maker Media, 2013); and Christopher Barnatt, *3D Printing: The Next Industrial Revolution* (CreateSpace, 2013).

² Christopher Pyne, '3D Printing Brings New Dimension to Australian Manufacturing' (Media Release, 19 November 2015) <<http://minister.industry.gov.au/ministers/pyne/media-releases/3d-printing-brings-new-dimension-australian-manufacturing>>.

³ Ibid.

the Australian Labor Party's Tim Watts and Jim Chalmers have discussed the role of 3D printing in respect of intellectual property, innovation, and trade.⁴

There have been a number of early cultural texts on the topic of 3D printing. Cory Doctorow's 2009 fictional story *Makers* was significant in promoting the culture of the maker community.⁵ Chris Anderson's 2012 non-fiction work *Makers* considered the history of the industrial revolution, the rise of 3D printing, and the long tail of things.⁶ His work also reflects upon the development of open licensing and open hardware, and the financing of maker businesses. This rather evangelical work helped inspire wider public interest in the field. In *The Maker Movement Manifesto*, Mark Hatch, the CEO of TechShop, provides a practical guide to the applications of 3D printing, and the development of communities of practice.⁷ He is particularly interested in the development of distributed and flexible manufacturing, and the acceleration of innovation. The engaging 2014 Lopez and Tweel documentary *Print the Legend* provided a portrait of the emergence of 3D printing start-up companies in the United States.⁸ In 2014, the Australian journalist and cultural critic Guy Rundle also undertook fieldwork in his study on 3D printing and robotics, visiting key hubs of 3D printing in the United States.⁹ In his work upon the robotics revolution, Martin Ford has explored the intersection between 3D printing and automation.¹⁰ Futurist Jeremy Rifkin has been interested in the intersections between 3D printing, the Internet of Things, and collaborative capitalism.¹¹ Likewise, Robin Chase has been concerned about how 3D printing fits into a larger model of the sharing economy.¹²

⁴ Commonwealth, *Parliamentary Debates*, House of Representatives, 2 February 2013, 1214-8 (Tim Watts); Jim Chalmers, '3D Printing: Not Yet a New Industrial Revolution, but Its Impact Will Be Huge', *The Guardian* (online), 11 December 2013 <<http://www.theguardian.com/commentisfree/2013/dec/11/3d-printing-not-yet-a-new-industrial-revolution-but-its-impact-will-be-huge>>.

⁵ Cory Doctorow, *Makers* (Tom Doherty Associates, 2009).

⁶ Chris Anderson, *Makers: The New Industrial Revolution* (Random House, 2012).

⁷ Mark Hatch, *The Maker Movement Manifesto: Rules for Innovation in the New World of Crafters, Hackers, and Tinkerers* (McGraw-Hill, 2013).

⁸ *Print the Legend* (Directed by Luis Lopez and Clay Tweel, Audax Films, 2014).

⁹ Guy Rundle, *A Revolution in the Making: 3D Printing, Robots and the Future* (Affirm Press, 2014).

¹⁰ Martin Ford, *The Rise of the Robots: Technology and the Threat of a Jobless Future* (Basic Books, 2015).

¹¹ Jeremy Rifkin, *The Zero Marginal Cost Society: The Internet of Things, the Collaborative Commons, and the Eclipse of Capitalism* (St Martin's Press, 2014).

¹² Robin Chase, *Peers Inc.: How People and Platforms are Inventing the Collaborative Economy and Reinventing Capitalism* (Headline Press, 2015).

In terms of legal writing in respect of 3D printing, a number of works have sought to address the relationship between intellectual property and 3D printing. As a public policy expert at Public Knowledge, and as a lawyer working for Shapeways, Michael Weinberg (2010, 2013) has written a number of significant treatises on intellectual property and 3D Printing.¹³ Associate Professor Dinusha Mendis and her colleagues have undertaken legal and empirical research on intellectual property and 3D printing for the United Kingdom Intellectual Property Office.¹⁴ In 2015, Professor Mark Lemley from Stanford Law School observes, 'A world in which sophisticated 3D printers are widely available would change the economics of things in a fundamental way.'¹⁵ Amongst other things, he says that 3D Printing provides challenges and opportunities for intellectual property in 'an age without scarcity'.¹⁶ John Hornick has examined the topic of intellectual property and 3D printing from the perspective of a legal practitioner.¹⁷ From Australia, Dr Angela Daly has written on the socio-legal aspects of 3D printing in 2016.¹⁸ The World Intellectual Property Organization in 2015 has sought to investigate 3D printing as a breakthrough technology in terms of emerging developments in respect of intellectual property law, practice, and policy.¹⁹

¹³ Michael Weinberg, *It Will Be Awesome If They Don't Screw It Up: 3D Printing, Intellectual Property, and the Fight over the Next Great Disruptive Technology* (Public Knowledge, 2010) <<https://www.publicknowledge.org/files/docs/3DPrintingPaperPublicKnowledge.pdf>>; Michael Weinberg, 'What's the Deal with Copyright and 3D Printing?' on *Public Knowledge* (29 January 2013) <<https://www.publicknowledge.org/news-blog/blogs/whats-the-deal-with-copyright-and-3d-printing>>.

¹⁴ Dinusha Mendis, 'Customising the Future Through New Business Models: The Impact of 3D Printing and 3D Scanning on Mass Customisation and its Implications for Copyright Law' (2015) *Script-ed*, 1-27; Dinusha Mendis, 'Networks of Power in Digital Copyright Law and Policy; Political Salience, Expertise and the Legislative Process' (2015) 37 (7) *European Intellectual Property Review* 474-475; Dinusha Mendis, Davide Secchi, and Phil Reeves, 'A Legal and Empirical Study into the Intellectual Property Implications of 3D Printing' (Research Report, UK Intellectual Property Office, 2015) <https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/421222/A_Legal_and_Empirical_Study_into_the_Intellectual_Property_Implications_of_3D_Printing_-_Exec_Summary_-_Web.pdf>; Dinusha Mendis and Davide Secchi, 'A Legal and Empirical Study of 3D Printing Online Platforms and an Analysis of User Behaviour' (Research Report, UK Intellectual Property Office, 2015) <<https://www.gov.uk/government/publications/a-legal-and-empirical-study-of-3d-printing-online-platforms-and-an-analysis-of-user-behaviour-study-1>>.

¹⁵ Mark Lemley, 'IP in a World Without Scarcity' (2015) 90 *New York University Law Review* 460-515.

¹⁶ *Ibid.*

¹⁷ John Hornick, *3D Printing Will Rock the World* (CreateSpace, 2015).

¹⁸ Angela Daly, *Socio-Legal Aspects of the 3D Printing Revolution* (Palgrave Pivot, 2016).

¹⁹ World Intellectual Property Organization, 'World IP Report: Breakthrough Innovation and Economic Growth' (Report, World Intellectual Property Organization, 2015)

There has been much interest in how intellectual property law, policy, and practice will adapt to the emergence of 3D printing and the maker movement. Intellectual property lawyers will have to grapple with the impact of additive manufacturing upon a variety of forms of intellectual property – including copyright law, trade mark law, designs law, patent law, and trade secrets. The disruptive technology of 3D printing will both pose opportunities and challenges for legal practitioners and policy-makers.

Rather than try to survey this expanding field, this article considers a number of early conflicts and skirmishes in respect of copyright law and 3D printing. There has been significant interest in the impact of 3D printing on copyright law and the creative industries.²⁰ There have been classic issues raised about copyright subsistence, and the overlap between copyright law and designs. There has also been a moral panic²¹ about 3D printing facilitating copyright infringement – like peer to peer networks such as Napster in the past.²² There has been a use of open licensing models such as Creative Commons licensing to facilitate the sharing of 3D printing files.²³ Such battles highlight a conflict between the open culture of the Maker Movement, and the closed culture of copyright industries. In many ways, such conflicts touch upon classic issues involved in ‘information environmentalism’.²⁴ Part II looks at the controversy over Left Shark. In particular, it examines the copyright claims of Katy Perry in respect of the Left

http://www.wipo.int/export/sites/www/econ_stat/en/economics/wipr/pdf/wipr_2015_chapter3.pdf

²⁰ Dinusha Mendis, ‘Customising the Future through New Business Models: The Impact of 3D Printing and 3D Scanning on Mass Customisation and its Implications for Copyright Law’ (2015) *Script-ed* 1-27; Dinusha Mendis, ‘Networks of Power in Digital Copyright Law and Policy; Political Salience, Expertise and the Legislative Process’ (2015) 37(7) *European Intellectual Property Review* 474-5.

²¹ William Patry notes that intellectual property owners often seek to advance economic interests under the guise of false moral imperatives: ‘Conjuring up moral panics and folk devils occurs through metaphors casting the other side in an unfavourable light, in the case of copyright, by painting those who use works without permission as thieves, trespassers, pirates, or parasites’. William Patry, *Moral Panics and the Copyright Wars* (Oxford University Press, 2009).

²² Mark Owen, ‘Is 3D Printing Facing its Napster Moment?’, *The Guardian* (online), 10 April 2014 <<http://www.theguardian.com/media-network/media-network-blog/2014/apr/10/3d-printing-napster-retail-legal>>.

²³ Jarkko Moilanen et al, ‘Cultures of sharing in 3D printing: what can we learn from the licence choices of Thingiverse users?’ (2015) 6 *Journal of Peer Production* <<http://peerproduction.net/issues/issue-6-disruption-and-the-law/peer-reviewed-articles/cultures-of-sharing-in-thingiverse-what-can-we-learn-from-the-licence-choices-of-thingiverse-users/>>.

²⁴ Robert Cunningham, *Information Environmentalism: A Governance Framework for Intellectual Property Rights* (Edward Elgar, 2014).

Shark figure. Part III considers questions about scanning. Augustana College tried to assert copyright against a maker, Jerry Fisher, who was scanning statues of Michelangelo (although copyright had long since expired in such work). Part IV focuses upon copyright law, 3D printing and readymades. The Estate of Marcel Duchamp lodged a copyright protest over a 3D printed set of chess, based on the work of Marcel Duchamp. Part V examines the intervention of a number of 3D printing companies in a Supreme Court of the United States dispute in *Star Athletic v. Varsity Brands*. Part VI considers copyright law and intermediary liability. Part VII examines the operation of technological protection measures in the context of copyright law and 3D Printing.

II SAVE LEFT SHARK: COPYRIGHT LAW, INTERNET MEMES, AND 3D PRINTING

The 2015 Super Bowl has sparked a public controversy over copyright law, Internet Memes, and 3D printing.²⁵

In 2015, the pop singer Katy Perry performed at the half-time entertainment during the Super Bowl. She presented a suite of hit songs – including ‘Roar’, ‘Dark Horse’, ‘I Kissed a Girl’ (with Lenny Kravitz), ‘Teenage Dream’, ‘California Gurls’, and an Missy Elliott medley: ‘Get Ur Freak On,’ ‘Work It,’ ‘Lose Control’, and ‘Firework’.²⁶ Her performance was upstaged by one of her backup dancers, Bryan Gaw – who was wearing a shark costume. While the Right Shark performed the choreography as scripted, the Left Shark improvised, and performed somewhat differently. The character of Left Shark was the subject of popular acclaim amongst the broadcasting audience, and

²⁵ For a further account of this dispute, see Aaron Walker, ‘Katy Perry Case Points to Need for Law Reforms in Intellectual Property and 3D Printing’, *ANU Media*, 13 March 2015 <<http://www.anu.edu.au/news/all-news/katy-perry-case-points-to-need-for-law-reforms>>; Matthew Rimmer, ‘Save Left Shark: Katy Perry, Intellectual Property, and 3D Printing’ (2016) 29(1) *Australian Intellectual Property Law Bulletin* 15; and Tesh Dagne, ‘The Left Shark, Thrones, Sculptures and Unprintable Triangle: 3D Printing and its Intersections with IP’ (2015) 25 *Albany Law Journal of Science and Technology* 573.

²⁶ Finlay Boyle, ‘Super Bowl 2015 Halftime Show: Move over Katy Perry, #leftshark causes Twitter Storm’, *Sydney Morning Herald* (online), 3 February 2015 <<http://www.smh.com.au/entertainment/music/super-bowl-2015-halftime-show-move-over-katy-perry-leftshark-causes-twitter-storm-20150203-134mcs.html>>.

LeftShark became an Internet Meme. This response to Left Shark was unanticipated, even by the directors of the Super Bowl Show²⁷

Political artist and maker Fernando Sosa has developed a distinctive reputation as a 'Political Sculptor', selling his 3d-printed figurines on Shapeways.²⁸ He has a long history of engaging in parody and satire of a wide range of forms of popular culture. Sosa decided to create a 3D figurine, 'Left Shark', in the wake of the Super Bowl.²⁹

On the 3rd February 2015, Katy Perry's lawyers sent a letter to the 3D printing site Shapeways, complaining about the Left Shark Design. The lawyers warned: 'Our client recently has learned that you have been involved in the manufacture, sale, marketing and distribution of merchandise featuring a shark sculpture which embodies and uses the IP, and that you have displayed this product on your website, www.shapeways.com, in connection with such sale and distribution.'³⁰ The lawyers denied that there had been any permission granted to use Left Shark: 'As you are undoubtedly aware, our 'client never consented to your use of its copyrighted work and IP, nor did our client consent to the sale of the infringing product.'³¹

The lawyers insisted that there had been an infringement of copyright vested in Left Shark: 'Your unauthorized display and sale of this product infringes our client's exclusive rights in numerous ways, including, but not limited to, infringement of our client's exclusive rights to reproduce, display, and distribute its copyrighted images under the United States *Copyright Act* as set forth in 17 U.S.C. §106.'³² The lawyers threatened legal action to recover

²⁷ Jessie Katz, 'Here's the True Story Behind Katy Perry's Viral Left Shark', *Billboard*, 2 January 2016, <<http://www.billboard.com/articles/news/6859524/katy-perry-left-shark-revealed-true-story-super-bowl>>; Jack de Menezes, "'Left Shark' Steals Super Bowl 2015 as Katy Perry is Upstaged by Her Out-of-Time Support Dancer', *Independent* (online), 2 February 2015, <<http://www.independent.co.uk/sport/us-sport/national-football-league/left-shark-steals-super-bowl-2015-as-katy-perry-is-upstaged-by-her-out-of-time-support-dancer-10017216.html>>.

²⁸ Michael Molitch-Hou, 'Politics and 3D Printing Make Strange Bedfellows: The Work of Fernando Sosa', *3D Printing Industry*, 8 January 2015 <<http://3dprintingindustry.com/2015/01/08/politics-3d-printing-make-strange-bedfellows-work-fernando-sosa/>>.

²⁹ Eddie Krassenstein, '3D Printed "Left Shark" Creator Launches Funding Campaign to Fight Katy Perry's Lawyers', *3D Print.com*, 8 February 2015 <<http://3dprint.com/43174/katy-perry-left-shark-lawyers/>>.

³⁰ Signe Brewster, 'Katy Perry's Lawyers Demand Takedown of 3D Printable Left Shark', *Gigaom*, 5 February 2015 <<https://gigaom.com/2015/02/05/katy-perrys-lawyers-demand-takedown-of-3d-printable-left-shark/>>.

³¹ Ibid.

³² Ibid.

damages: ‘Your infringing conduct entitles our client to significant legal relief against you, which may include actual damages, statutory damages, and punitive damages, as well as immediate and permanent injunctive relief.’³³ The letter was most peculiar, though, because it was not formatted as a take down notice in the form prescribed by the *Digital Millennium Copyright Act* 1998 (US).³⁴

The 3D Printing hub, Shapeways, was disturbed by the notice from Katy Perry’s letters:

It’s a shame because we love our community and always want to be able to support their designs. That’s part of the reason why our work with Hasbro is so fun! It’s allowing fans to create products truly inspired by the things they personally enjoy. We know these things can happen when you have a lot of user-generated content, but hopefully more brands (and celebrities!) will take note and want to work together with fans to create amazing products!³⁵

Shapeways’ lawyer, Michael Weinberg, was ultimately sceptical of the copyright claims made by Katy Perry’s lawyers.³⁶ In the end, Shapeways reinstated the design for the Left Shark by Fernando Sosa.

In response, Fernando Sosa launched a campaign to defend himself against the legal charges. Professor Christopher Sprigman from New York University – the co-author of *The Knockoff Economy*³⁷ – has provided robust legal representation for Fernando Sosa in the dispute.³⁸ The legal academic noted: ‘Mr. Sosa is not especially eager to be fighting over copyright, but the legal merits of your claim seem very weak.’³⁹ He questioned whether it was sensible to bring a legal action in respect of a viral internet meme.

³³ Ibid.

³⁴ Mike Masnick, ‘There’s Something Fishy with Katy Perry’s Left Shark 3D Printing Takedown’, *TechDirt*, 6 February 2015 <<https://www.techdirt.com/articles/20150205/16305829921/katy-perry-claims-copyright-over-left-shark-issues-takedown-over-3d-printable-version.shtml>>.

³⁵ Signa Brewster, ‘Katy Perry’s Lawyers Demand Takedown of 3D Printable Left Shark’, *Gigaom*, 5 February 2015 <<https://gigaom.com/2015/02/05/katy-perrys-lawyers-demand-takedown-of-3d-printable-left-shark/>>.

³⁶ Michael Weinberg, ‘Why Katy Perry’s Lawyers Just Jumped the Shark’, *Make*, 6 February 2015 <<http://makezine.com/2015/02/06/why-katy-perrys-lawyers-just-jumped-the-shark/>>.

³⁷ Kal Raustiala and Christopher Sprigman, *The Knockoff Economy: How Imitation Sparks Innovation* (Oxford University Press, 2012).

³⁸ Mike Masnick, ‘Left Shark Bites Back: 3D Printer Sculptor Hires Lawyer to Respond to Katy Perry’s Bogus Takedown’, *TechDirt*, 9 February 2015 <<https://www.techdirt.com/articles/20150209/11373729960/left-shark-bites-back-3d-printer-sculptor-hires-lawyer-to-respond-to-katy-perrys-bogus-takedown.shtml>>.

³⁹ Ibid.

First, Sprigman asked Katy Perry's lawyers, 'Can you tell me why you believe the costume of a shark that you claim Katy Perry owns is copyrightable?'⁴⁰ He observed: 'As you likely know, federal courts and the United States Copyright Office have made clear that costumes are generally not copyrightable'.⁴¹ Sprigman asked for a justification for copyright subsistence in respect of the Left Shark costume: 'Please tell me why you think the Left Shark costume should be treated differently.'⁴²

Second, Sprigman questioned Katy Perry's the basis for her claim of copyright ownership in respect of the Left Shark costume: 'What is the basis for your claim that Katy Perry, and not some other person, owns the copyright?'⁴³ He queried the basis of the claim of authorship: 'Did Katy Perry design the Left Shark costume?'⁴⁴ He observed: 'We ask about ownership not least because Katy Perry herself suggested that she didn't have control over the content of her halftime show, but rather the NFL did.'⁴⁵ Sprigman cited an interview by Katy Perry with *Elle magazine*, in which she said: 'With the NFL, I have to be accountable to several levels of red tape.'⁴⁶ Moreover, Katy Perry commented: 'So I am no longer the boss; I have to relinquish that control.'⁴⁷ Sprigman suggested: 'At the very least, Katy Perry's own account raises questions about what, if anything, she owns. If she wasn't the boss of her halftime show, she's also unlikely to be the copyright owner.'⁴⁸

Sprigman suggested that Katy Perry's lawyers should drop the action altogether: 'My client wants to get back to his business, and he (and I'd wager pretty much everyone else) would be grateful if you'd just back off. Going ahead with these very dubious copyright claims will not benefit Katy Perry'.⁴⁹ He suggested that, if Katy Perry wanted to continue with the lawsuit, she should answer the legal questions: 'But if you're determined to press on, please do respond to my legal questions, and we can try to work it out from there.'⁵⁰

⁴⁰ Ibid.

⁴¹ Ibid.

⁴² Ibid.

⁴³ Ibid.

⁴⁴ Ibid.

⁴⁵ Ibid.

⁴⁶ Ibid.

⁴⁷ Ibid.

⁴⁸ Ibid.

⁴⁹ Ibid.

⁵⁰ Ibid.

Fernando Sosa remains undaunted by the conflict. He is offering a wide range of versions of Left Shark on his Political Sculptor site.⁵¹ As well as a traditional 'Left Shark', Sosa also has a 'Drunk Shark', a 'Pink Drunk Shark', a 'Customised Left Shark', a 'Cease and Desist Left Shark', a 'Left Sharknado', 'Come at me Bro – Left Shark', and 'Left Shark Lawyer', with a moustache. Sosa is obviously keen to exercise his rights and freedoms under the broad and flexible defence of fair use, and the First Amendment.

There has been much uncertainty about the status of copyright protection in respect of fashion in the United States. The Copyright Office has given guidance on the Registrability of Costume Designs. Famously, in a 1991 policy decision, Ralph Oman, the Register of Copyrights, said: 'Costumes, by their very nature, exist at the boundary between works of imagination and works of utility.'⁵² The Register of Copyrights said: 'Portions of some costumes will be registrable under the separability test, and others will be unregistrable in all respects.'⁵³ 3D Printing has increasingly focused upon the field of fashion.⁵⁴ There has been quite revolutionary uses and applications of 3D printing in respect of fashion.

A number of intellectual property experts provided support for the position of Christopher Sprigman and Fernando Sosa. Professor Rebecca Tushnet from Georgetown Law and the Organization for Transformative Works commented on the controversy:

A costume is a useful article, and useful articles aren't copyrightable unless there are elements that are 'separable' from the useful article itself. For example, anything necessary for a human to fit in the costume (and dance, badly or well) would not be separable. Some costumes may be copyrighted, and I think it's possible Left Shark could be one of them, but further factual development would be required.⁵⁵

⁵¹ Fernando Sosa, *Political Sculptor* <<http://politicalsculptor.com/#>>.

⁵² Copyright Office, Library of Congress, *Policy Decision: Registrability of Costume Designs* (29 October 1991) <<http://www.copyright.gov/history/mls/ML-435.pdf>>.

⁵³ Ibid.

⁵⁴ 3D Printing.com, *Fashion* <<http://3dprinting.com/fashion/>>; Michael Molitch-Hou Mon, 'Nervous System's Latest 4D Printed Dress Twirls into the Museum of Fine Arts', *3D Printing Industry*, 29 February 2016 <<http://3dprintingindustry.com/news/nervous-systems-latest-4d-printed-dress-twirls-into-the-museum-of-fine-arts-67544/>>. The leading 3D printing fashion designer is Iris van Herpen <<http://www.irisvanherpen.com/>>.

⁵⁵ Jeff John Roberts, 'Left Shark Printer Chomps on Katy Perry's Copyright Claim', *Gigaom*, 9 February 2015 <<https://gigaom.com/2015/02/09/left-shark-printer-chomps-on-katy-perrys-copyright-claim/>>.

She also noted that there could also be larger issues about the operation of copyright exceptions – like the defence of fair use: ‘Fair use might well be a significant issue, given the nature of the meme surrounding Left Shark.’⁵⁶ In this context, a number of precedents in respect of copyright law, appropriation art, and fair use could be relevant.⁵⁷

Parker Higgins, a researcher at the Electronic Frontier Foundation, commented: ‘I agree with Sprigman on this one: costumes are considered useful articles, so absent a separable design with a claim to it (like a print, usually) it doesn’t get copyright.’⁵⁸

Overall, there are concerns as to whether Katy Perry is engaged in copyfraud – making copyright claims in respect of a public domain work.⁵⁹ There have been a number of other controversies about copyright subsistence involving 3D printing.

In addition to the copyright conflicts over 3D printing Left Shark, there has also been much controversy in respect of 3D printing and trade mark law. Such matters have included debates over trade mark registration, trade mark licensing and trade mark infringement. In February 2015, Katy Perry’s lawyers filed for a trade mark application in respect of Left Shark.⁶⁰ Trade mark applications were filed in respect of ‘Basking Shark’, ‘Drunk Shark’, ‘Right Shark’ and ‘Left Shark’, and various designs of a shark. In April 2015, United States Patent and Trademark Office examiner, David Collier, questioned the trade mark applications by Katy Perry.⁶¹ The examiner said that the Left Shark image ‘identifies only a particular character; it does not function as a service mark to

⁵⁶ Ibid.

⁵⁷ See United States Copyright Office Fair Use Index <<http://copyright.gov/fair-use/>>; *Gaylord v United States*, 595 F 3d 1364 (Fed Cir, 2010); *Cariou v Prince*, 714 F 3d 694 (2nd Cir, 2013); *Seltzer v Green Day Inc*, 725 F 3d 1170 (9th Cir, 2013). For a summary, see Matthew Rimmer, ‘A Fair Use Project for Australia: Copyright Law and Creative Freedom’ (2010) 28(3) *Copyright Reporter* 165; and Pamela Samuelson, ‘Possible Futures of Fair Use’ (2015) *Washington Law Review* (forthcoming) <http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2584180>.

⁵⁸ Jeff John Roberts, ‘Left Shark Printer Chomps on Katy Perry’s Copyright Claim’, *Gigaom*, 9 February 2015 <<https://gigaom.com/2015/02/09/left-shark-printer-chomps-on-katy-perrys-copyright-claim/>>.

⁵⁹ Jason Mazzone, *Copyfraud and Other Abuses of Intellectual Property Law* (Stanford University Press, 2011).

⁶⁰ Killer Queen LLC, ‘Left Shark’, United States Trade Mark Application Serial Number 86526826, Filing Date, 6 February 2015.

⁶¹ Eriq Gardner, ‘Katy Perry’s “Left Shark” Design Rejected by Trademark Examiner’, *The Hollywood Reporter* (online), 21 April 2015 <<http://www.hollywoodreporter.com/thr-esq/katy-perrys-left-shark-design-790542>>.

identify and distinguish applicant's services from those of others and to indicate the source of applicant's services.⁶² The trade mark examiner was somewhat more sympathetic to the trade mark application in respect of the word mark for 'Left Shark'. The examiner has sought to gain greater clarification over the identity of the goods that are the subject of the trade mark application.

III MICHELANGELO'S STATUES

Another important controversy involved an United States college seeking to claim copyright over replicas of Michelangelo's statues in a dispute over 3D printing.⁶³ Obviously, such works were in the public domain, and did not enjoy any further copyright protection.

In this matter, Jerry Fisher sought to photograph two statues of David and Moses based on the work of Michelangelo – one based in a city park and the other on a college campus – and make 3D models.⁶⁴ He then proceeded to post his files on a range of social media sites, including Twitter, Google +, and Thingiverse. Augustana College demanded that Jerry Fisher take down the files. The college, associated with the Evangelical Lutheran Church in the United States, was uncomfortable with the 3D printed models, and was also concerned that the digital images could be used inappropriately. Peggy Kapusta, director of online communications at Augustana College, maintained:

Mr. Fisher did not seek the permission of Augustana College nor the City of Sioux Falls prior to pursuing the 3D reconstruction technology or before offering [the 3-D model] to others. ... In October 2014, we reached out to Mr. Fisher to express our concern over his actions in light of the fact that he did not seek permission from the College, the City of Sioux Falls or the families of the artist and/or the Fawicks [the family who donated the statue]. At this point, Mr. Fisher made the decision to un-publish the 3D image file.⁶⁵

⁶² Ibid.

⁶³ Ariel Bogle, 'Good News: Replicas of 16th Century Sculptures Are Not Off-Limits for 3-D Printers', *Future Tense*, 26 January 2015, <http://www.slate.com/blogs/future_tense/2015/01/26/3_d_printing_and_copyright_replicas_of_16th_century_sculptures_are_not.html>.

⁶⁴ Bridget Butler Millsaps, 'Sioux Falls Maker Accused of Infringing on Copyright Laws with 3D Models of Michelangelo's Statues', *3D Print.com*, 21 January 2015 <<http://3dprint.com/38631/michelangelo-copyright-models/>>.

⁶⁵ Ariel Bogle, 'Good News: Replicas of 16th Century Sculptures Are Not Off-Limits for 3-D Printers', *Future Tense*, 26 January 2015

This seems to be a rather aggressive copyright claim to make in respect of work that was in the public domain.

Michael Weinberg – then at Public Knowledge – commented that the claim was ill-founded.⁶⁶ He observed that copyright had long since expired in the work of Michelangelo:

Augustana College had no legal right or basis to threaten Fisher with the specter of infringement. There is no copyright protection for a sculpture that was created at the dawn of the 16th century by a sculptor who died 450 years ago. All of Michelangelo's work is firmly in the public domain. In fact, copyright didn't even exist during Michelangelo's lifetime. From the moment he sculpted his Moses anyone could copy, remix, and build upon it for any reason, without having to ask permission. Of course, the sculpture in Sioux Falls is not Michelangelo's original sculpture. The original Moses is still in Italy. The Sioux Falls sculptures are exact replicas made in the early 1970s - exact replicas, it seems appropriate to mention, that were made without permission of Michelangelo's estate because the originals are not protected by copyright. There was no copyright on the original sculpture, and there is no copyright in the exact copies of the original sculpture.⁶⁷

Weinberg commented: 'If Fisher were practicing his 3D scanning on original sculptures made in the early 1970s, the sculptures would likely still be protected by copyright.'⁶⁸ He observed: 'Fortunately for Fisher and everyone else, the sculpture in question is not an original sculpture – it is a copy.'⁶⁹ He noted: 'Just as scanning a 16th century map doesn't give me a new copyright in the scan file, casting a copy of a 16th century sculpture doesn't give me a new copyright in the cast.'⁷⁰

Michael Weinberg was disappointed that Augustana College refused to apologise for its false copyright claims.⁷¹ He observed: 'When confronted with their copyfraud, the correct thing for Augustana to do would have been to

http://www.slate.com/blogs/future_tense/2015/01/26/_3_d_printing_and_copyright_replicas_of_16_th_century_sculptures_are_not.html>.

⁶⁶ Michael Weinberg, 'Cultural Institutions Behaving Badly: Stupid Reactions to 3D Scanning', *Public Knowledge*, 22 January 2015 <<https://www.publicknowledge.org/news-blog/blogs/cultural-institutions-behaving-badly-stupid-reactions-to-3d-scanning-and-co>>.

⁶⁷ Ibid.

⁶⁸ Ibid.

⁶⁹ Ibid.

⁷⁰ Ibid.

⁷¹ Michael Weinberg, 'Doubling Down on Copyfraud: You Don't Need Permission to 3D Scan 500 Year Old Sculptures', *Public Knowledge*, 27 January 2015 <<https://www.publicknowledge.org/news-blog/blogs/doubling-down-on-copyfraud-you-dont-need-permission-to-3d-scan-500-year-old>>.

apologize and invite Mr. Fisher to repost his scans.’⁷² Weinberg commented: ‘Instead, Augustana decided to suggest that anyone scanning their copy of Michelangelo’s Moses first needs to get permission from Augustana, the City of Sioux Falls, and the Fawicks.’⁷³ He emphasized: ‘That claim is wrong.’⁷⁴ Michael Weinberg chided the college: ‘It is also an embarrassment for Augustana College and, by extension Sioux Falls and the Fawicks.’⁷⁵

Ariel Bogle commented on the battle: ‘Creative possibilities aside, the legal challenges that will face the 3-D printing of artistic objects are just beginning to unfold.’⁷⁶

Much like the LeftShark case, Michelangelo’s statues raised larger questions about what was in the field of copyright law, and what was left in the public domain. The dispute highlights the need for stronger remedies and penalties in respect of cases of ‘copyfraud.’⁷⁷ As Dr Angela Daly has noted, there have been an increasing range of legal disputes over scanning technologies.⁷⁸

IV MARCEL DUCHAMP’S CHESS SET

There has been a long history of copyright conflicts over ready-mades, appropriation art, and mash-ups.⁷⁹

Marcel Duchamp is a major figure in international art.⁸⁰ He is particularly famous for his ‘Readymades’ – ordinary manufactured objects, which the artist selected and modified as artistic works. His body of work has been an

⁷² Ibid.

⁷³ Ibid.

⁷⁴ Ibid.

⁷⁵ Ibid.

⁷⁶ Ariel Bogle, ‘Good News: Replicas of 16th Century Sculptures Are Not Off-Limits for 3-D Printers’, *Future Tense*, 26 January 2015 <http://www.slate.com/blogs/future_tense/2015/01/26/_3_d_printing_and_copyright_replicas_of_16th_century_sculptures_are_not.html>.

⁷⁷ Jason Mazzone, *Copyfraud and Other Abuses of Intellectual Property Law* (Stanford University Press, 2011).

⁷⁸ Angela Daly, *Socio-Legal Aspects of the 3D Printing Revolution* (Palgrave Pivot, 2016).

⁷⁹ For my previous work in this area, see Matthew Rimmer, *The Pirate Bazaar: The Social Life of Copyright Law*, Sydney: The University of New South Wales School of Law, 2001; Matthew Rimmer, ‘Daubism: Copyright Law And Artistic Works’ (2002) 9 (4) *Murdoch University Electronic Journal of Law* <http://papers.ssrn.com/sol3/papers.cfm?abstract_id=600864>; Matthew Rimmer, *Digital Copyright and the Consumer Revolution: Hands off my iPod* (Edward Elgar, 2007); and Matthew Rimmer, ‘A Fair Use Project for Australia: Copyright Law and Creative Freedom’ (2010) 28(3) *Copyright Reporter* 165.

⁸⁰ Calvin Tomkins, *Duchamp: A Biography* (Henry Holt, 1996).

inspiration for pop artists, appropriation artists, digital samplers, and mash-up artists through the ages. However, Marcel Duchamp's estate has been quite a fierce guardian of the copyright vested in his works.

There has also been an international fight over 3D printing Marcel Duchamp's Chess Set.⁸¹ In response to a cease and desist order, the designers have returned with a second set of Duchamp-inspired 3D printed chess pieces.⁸²

Scott Kildall and Bryan Cera were inspired to create a chess set, which was a 3D printed version of Marcel Duchamp's Chess Set, which had been pictured in photographs.⁸³ The artists explained the nature of the project:

Readymake: Duchamp Chess Set is a 3D-printed chess set generated from an archival photograph of Marcel Duchamp's own custom and hand-carved game. His original physical set no longer exists. We have resurrected the lost artifact by digitally recreating it, and then making the 3D files available for anyone to print.⁸⁴

The artists commented: 'We were inspired by Marcel Duchamp's *readymade* — an ordinary manufactured object that the artist selected and modified for exhibition — the *readymake* brings the concept of the appropriated object to the realm of the internet, exploring the web's potential to re-frame information and data, and their reciprocal relationships to matter and ideas.'⁸⁵ In their view, '*Readymakes* transform photographs of objects lost in time into shared 3D digital spaces to provide new forms and meanings.'⁸⁶ They noted: 'Just for the sake of clarity, what we call a "readymake" is a play on the phrase "readymade".'⁸⁷ The artists stressed: 'It is ready-to-make, since it can be physically generated by a 3D printer.'⁸⁸

⁸¹ Quinn Norton, 'The International Fight Over Marcel Duchamp's Chess Set', *The Atlantic* (online), 8 September 2015 <<http://www.theatlantic.com/technology/archive/2015/09/the-international-fight-over-marcel-duchamps-chess-set/404248/>>.

⁸² Bridget Butler Millsaps, 'Ordered to Cease & Desist, Designers Return with 2nd Set of Duchamp-Inspired 3D Printed Chess Pieces', *3DPrint.com*, 8 September 2015 <<http://3dprint.com/93827/duchamp-3d-printed-chess-2/>>.

⁸³ Scott Kildall and Bryan Cera, 'What Happened to the Readymake: Duchamp Chess Pieces?', *New Media Art and Research*, 2 September 2015 <<http://kildall.com/what-happened-to-the-readymake-duchamp-chess-pieces/>>.

⁸⁴ Ibid.

⁸⁵ Ibid.

⁸⁶ Ibid.

⁸⁷ Ibid.

⁸⁸ Ibid.

On the 17th September 2014, the Estate of Marcel Duchamp wrote to Thingiverse, Makerbot Industries, and Bryan Cera and Scott Kildall.⁸⁹ The letter emphasized that ‘all the elements that make up the Chess set are original works, created between 1918 and 1919 by Marcel Duchamp.’⁹⁰ The lawyer argued that ‘the Chess set was not an objected diverted from its initial function in order to be presented as a work of art.’⁹¹ Thus the lawyer insisted that ‘the Chess set belongs by no means to the “ready-made” works of Marcel Duchamp.’⁹² Moreover, the lawyer maintained that the ‘original 36 wooden chess pieces still exist and were displayed several times in exhibitions.’⁹³ The lawyer insisted that ‘all the elements that make up the Chess set are original works by Marcel Duchamp’ and ‘these works remain subject to intellectual property rights.’⁹⁴

The lawyer observed that ‘elaboration of files allowing to generate 3D prints and molds of the Chess set constitutes an adaptation of the works of Marcel Duchamp, and thus should have been beforehand agreed to by the rights holder.’⁹⁵ The lawyer maintained that ‘reproduction of the elements of the Chess set is a counterfeit of the works of Marcel Duchamp.’⁹⁶ The lawyer insisted that ‘reproduction of the elements of the Chess set is a counterfeit of the works of Marcel Duchamp.’⁹⁷ The lawyer also maintained that ‘providing the aforementioned files to the general public, even on a non-profit basis, is also an infringement of the intellectual property rights owned by my clients.’⁹⁸ Furthermore, ‘under French law, infringement of any intellectual property rights may give rise to damages and is also likely to constitute a criminal offence.’⁹⁹

The creative artists sought legal advice from the Electronic Frontier Foundation and others.¹⁰⁰ They were troubled by the complex jurisdictional issues involved in the case. The creative artists observed that there seven key

⁸⁹ Celine Degoulet, ‘Letter to Thingiverse, Makerbot Industries LLC, Bryan Cera, and Scott Kildall’, 17 September 2014 <<http://kildall.com/what-happened-to-the-readymake-duchamp-chess-pieces/>>.

⁹⁰ Ibid.

⁹¹ Ibid.

⁹² Ibid.

⁹³ Ibid.

⁹⁴ Ibid.

⁹⁵ Ibid.

⁹⁶ Ibid.

⁹⁷ Ibid.

⁹⁸ Ibid.

⁹⁹ Ibid.

¹⁰⁰ Scott Ridall and Bryan Cera, ‘What Happened to the Readymake: Duchamp Chess Pieces?’, *New Media Art and Research*, 2 September 2015 <<http://kildall.com/what-happened-to-the-readymake-duchamp-chess-pieces/>>.

factors in the legal dispute. First, ‘Duchamp’s chess pieces were created in 1917-1918’ and ‘according to US copyright law, works published before 1923 are in the realm of “expired copyright”.’¹⁰¹ Second, ‘The chess pieces themselves were created in 1917-1918 while Duchamp was in Argentina.’¹⁰² Third, ‘According to French copyright law, copyrighted works are protected for 70 years after the author’s death.’¹⁰³ Fourth, ‘Under French copyright law, you can be sued for damages and even serve jail time for copyright infringement.’¹⁰⁴ Fifth, ‘The only known copy of the chess set is in a private collection. We were originally led to believe the set was ‘lost’ – as it hasn’t been seen, publicly, for decades.’¹⁰⁵ Sixth, the artists recognised: ‘For the Estate to pursue us legally, the most common method would be to get a judgment in French court, then get a judgment in a United States court to enforce the judgement.’¹⁰⁶ Seventh, the artists were concerned about the jurisdictional questions in the case. They noted: ‘As United States citizens, we are protected by U.S. copyright law’.¹⁰⁷ However, they recognised: ‘But, since websites like Thingiverse are global, French copyright *could* apply.’¹⁰⁸

Ultimately, the creative artists agreed to remove the offending files:

We *understand* the Estate’s point-of-view – their duty, after all, is to preserve Duchamp’s legacy. Outside of an art context, a manufacturer could easily take the files and mass produce the set. Despite the fact we did put this under a Creative Commons license that stipulated that the chess set couldn’t be used for commercial purposes, we understand the concern. If we had chosen to stand our ground, we would have had various defenses at our disposal. One of them is that French law wouldn’t have applied since we are doing this from a U.S. server. But, the rules around this are uncertain. If we had been sued, we would have defended on two propositions: (1) our project would be protected under U.S. law; (2) notwithstanding this, under U.S. law, we have a robust and widely-recognized defense under the nature of Fair Use. We would make the argument that our original Duchamp Chess Pieces would have added value to these objects. We would consider invoking Fair Use in this case. But, the failure of a

¹⁰¹ Ibid.

¹⁰² Ibid.

¹⁰³ Ibid.

¹⁰⁴ Ibid.

¹⁰⁵ Ibid.

¹⁰⁶ Ibid.

¹⁰⁷ Ibid.

¹⁰⁸ Ibid.

legal system is that it is difficult to employ these defenses unless you have the teeth to fight. And teeth cost a lot of money.¹⁰⁹

This discussion highlights some of the practical limitations involved in defending copyright exceptions.

Writing for *The Atlantic*, Quinn Norton provided an account of the international fight over Marcel Duchamp's Chess Set.¹¹⁰ She observed: 'If entering this framework means printable physical objects are going to go into the same global legal morass as music and software have, we face interesting times indeed.'¹¹¹

In response to the legal conflict, Kildall and Cera came up with an innovative solution.¹¹² The pair noted: 'We thought about how to recoup the intent of this project without what we think will be a copyright infringement claim from the Duchamp Estate and realized one important aspect of the project, which would likely guarantee it as commentary is one of parody.'¹¹³ They observed: 'Accordingly, we have created Chess with Mustaches, which is based on our original design, however, adds moustaches to each piece.'¹¹⁴ Kildall and Cera observed: 'The pieces no longer looks like Duchamp's originals, but instead improves upon the original set with each piece adorned with moustaches.'¹¹⁵

Timothy Geigner observed of this humorous solution: 'If you're not fully aware of Duchamp's artwork, this solution is especially clever because the Duchamp estate would have a difficult time arguing that this is inappropriate, given Duchamp's own artwork.'¹¹⁶ He laments, though, the use of copyright law by the estate in this dispute: 'The Duchamp estate's use of copyright to

¹⁰⁹ Ibid.

¹¹⁰ Quinn Norton, 'The International Fight over Marcel Duchamp's Chess Set', *The Atlantic* (online), 8 September 2015, <<http://www.theatlantic.com/technology/archive/2015/09/the-international-fight-over-marcel-duchamps-chess-set/404248/>>.

¹¹¹ Ibid.

¹¹² Timothy Geigner, 'Family of Marcel Duchamp Gets 3D Print Design for Duchamp Chess Set Removed Back into History over Copyright', *TechDirt*, 9 September 2015 <<https://www.techdirt.com/articles/20150909/10253532204/family-marcel-duchamp-get-3d-print-design-duchamp-chess-set-removed-back-into-history-over-copyright.shtml#comments>>.

¹¹³ Ibid.

¹¹⁴ Ibid.

¹¹⁵ Ibid.

¹¹⁶ Ibid.

disappear recreative files for a chess set once constructed is a bastardization of copyright's intent.¹¹⁷

The creative addition of moustaches to the chess pieces will also give the 3D printing makers the ability to raise larger arguments about copyright exceptions. The defence of fair use extends to parody in the United States. Under French copyright law, an author cannot prevent parody, pastiche, and caricature, 'taking into account the usage of the genre'. Australia has a specific fair dealing exception for parody and satire.

It is disturbing that the estate of Marcel Duchamp is so aggressively enforcing copyright – given that his appropriation art has been imitated by everyone from Andy Warhol to Ai Weiwei.¹¹⁸ Cory Doctorow was irate at the conflict: 'It's a common story, and one of copyright's worst contemporary failure-modes: descendants denying their ancestors' posterity, censoring living artists' work in the name of a long-dead one.'¹¹⁹

The dispute over Marcel Duchamp's chess set raises a number of important themes. The conflict highlights the long term of copyright protection. The dispute also raises issues about how to address 'lost' and 'orphan works'. The conflict also raises larger questions about the role of copyright estates in guarding the economic and moral interests of creative artists. There have previously been controversies over other copyright estates – like the Joyce Estate and the Beckett Estate.¹²⁰ There are interesting questions about copyright subsistence in respect of 'readymades'. The dispute also highlights issues of copyright infringement in respect of 3D printing and the Maker Movement. The operation of copyright exceptions also played an important role in terms of the creative artists' response to the dispute. The case of Marcel Duchamp's chess set also highlights how 3D printing raises larger questions in respect of jurisdiction, with the transmission of files across the Internet, through intermediaries such as the Thingiverse. The case study reinforces the thesis of

¹¹⁷ Ibid.

¹¹⁸ National Gallery of Victoria, *Andy Warhol – Ai Weiwei*, 11 December 2015–24 April 2016, <<http://www.ngv.vic.gov.au/exhibition/andy-warhol-ai-wei-wei/>>.

¹¹⁹ Cory Doctorow, 'Marcel Duchamp's Heirs Nuke Hobbyists' Hand-Modelled 3D Chess-Set Files', *BoingBoing*, 9 September 2015 <<http://boingboing.net/2015/09/09/marcel-duchamps-heirs-nuke-h.html>>.

¹²⁰ Matthew Rimmer, 'Bloomsday: Copyright Estates and Cultural Festivals' (2005) 2(3) *Scripted (University of Edinburgh)* 383; Matthew Rimmer, 'Damned To Fame: The Moral Rights of the Beckett Estate' (2003) 24(5) *Incite* <<http://www.alia.org.au/incite/2003/05/beckett.html> <<http://www.austlii.edu.au/au/journals/inCiteALIA/2003/79.html>>.

Dr Angela Daly that 3D printing will encounter significant barriers and obstacles, because of the comparative differences in the treatment of copyright law between the United States, the European Union, and other jurisdictions.¹²¹

V BRING IT ON: *STAR ATHLETICA V. VARSITY BRANDS*

There has been much legal debate over copyright and cheerleading designs in the 2015 case of *Varsity Brands, Inc. v. Star Athletic, LLC*.¹²² The majority held that ‘because we believe that the graphic features of Varsity’s cheerleading-uniform designs are more like fabric design than dress design, we hold that they are protectable subject matter under the Copyright Act.’¹²³ The majority observed: ‘We therefore enter summary judgment for Varsity solely on the issue of the protectability of Varsity’s designs as pictorial, graphic, or sculptural works. Because we conclude that Varsity is entitled to judgment on the issue of whether its designs are “pictorial, graphic, or sculptural works” and not uncopyrightable “useful articles,” there is no need to address whether expert testimony would be proper in this case to determine the copyrightability of a design, as Varsity requests’.¹²⁴ The majority noted: ‘We express no opinion about whether Varsity’s designs are ineligible for copyright protection because they lack originality or any other reason.’¹²⁵

In dissent, McKeague J observed that ‘it is apparent that either Congress or the Supreme Court (or both) must clarify copyright law with respect to garment design.’¹²⁶ The judge noted that the ‘law in this area is a mess – and it has been for a long time.’¹²⁷

In the case of *Star Athletica v. Varsity Brands*, a number of 3D printing companies have filed a brief to the Supreme Court of the United States to establish a test for determining conceptual separability under copyright law.¹²⁸

¹²¹ Angela Daly, *Socio-Legal Aspects of the 3D Printing Revolution* (Palgrave Pivot, 2016).

¹²² *Varsity Brands Inc v Star Athletic LLC* (6th Cir, No 14-5237, 19 August 2015) <<http://www.ca6.uscourts.gov/opinions.pdf/15a0194p-06.pdf>>.

¹²³ Ibid.

¹²⁴ Ibid.

¹²⁵ Ibid.

¹²⁶ Ibid.

¹²⁷ Ibid.

¹²⁸ Formlabs Inc, Matter and Form Inc and Shapeways Inc, ‘Brief of Amici Curiae Formlabs Inc., Matter and Form Inc., and Shapeways Inc. in Support of Petitioner’, Submission in *Star Athletica LLC v Varsity Brands*, No 15-866, 8 February 2016 <<http://www.shapeways.com/wordpress/wp-content/uploads/2016/02/Star-Athletica-v-Varsity-Brands-Amicus-of-Shapeways-FILED.pdf>>.

The companies involved include Formlabs Inc., Matter and Form Inc., and Shapeways Inc. In many ways, this dispute focuses upon legal issues thrown up by the controversy over Left Shark. The submission noted: ‘This case presents a clear conflict among the circuits on an important substantive matter of copyright law that justifies this Court’s review’.¹²⁹ The submission comments:

The present circuit split surrounding conceptual separability doctrine will, if left unresolved, have effects reaching far beyond the apparel industry. The already large and rapidly expanding 3D printing industry is particularly sensitive to uncertainty about the copyright protection of designs and objects. 3D printing, also known as additive manufacturing, allows users to use digital files to produce tangible objects in a manner that is often faster and more efficient than conventional fabrication techniques. In some cases, 3D printing even enables the production of shapes and forms that would be impossible to create using less revolutionary methods. The 3D printing industry has had a democratizing effect on manufacturing, allowing individuals to customize designs for their own use and greatly lowering startup costs for new entrants in markets for the design and sale of a wide variety of objects.¹³⁰

The submission warns: ‘These advancements are threatened by the current fractured state of copyright law on objects combining functional and artistic elements.’¹³¹ The 3D companies are concerned:

Uncertainty over the line between copyrightable and noncopyrightable works can lead to over-claiming and overcategorization of material as copyrightable, upsetting the balance struck by Congress between the interests of rights holders and the societal benefits from a vibrant public domain.¹³²

The 3D Printing companies complained that ‘Circuit court decisions since the introduction of the idea of conceptual separability in the Copyright Act of 1976 have created a conflicting, convoluted body of law’.¹³³ The industry groups despaired: ‘There now exist as many as ten separate methods for evaluating conceptual separability, and the circuits do not even agree on how to answer questions common to their different tests’.¹³⁴ The 3D printing companies argue: ‘This split generates exactly the sort of legal uncertainty that disrupts the balance of copyright law’.¹³⁵ In their view, ‘The need to navigate the complex

¹²⁹ Ibid 3.

¹³⁰ Ibid.

¹³¹ Ibid.

¹³² Ibid 4.

¹³³ Ibid.

¹³⁴ Ibid.

¹³⁵ Ibid.

legal regime created by the current circuit split threatens to chill innovation and creativity by, and impose significant costs on, individuals and small companies that lack in-house legal capabilities or resources for outside legal guidance'.¹³⁶ The 3D Printing companies warned the adverse impact of the legal uncertainty in the field: 'The current state of the law increases barriers to entry for market participants who stand to take greatest advantage of 3D printing.'¹³⁷ The 3D printing companies observed: 'The confusion surrounding the conceptual separability doctrine will likely lead to elevated levels of litigation, and, where the law differs from circuit to circuit, affect both the reach of copyright holders' rights and the size of markets available to manufacturers.'¹³⁸

First, in the body of the argument, the 3D printing companies maintained that a single, predictable test for copyright separability is critical not just for the apparel business but also for innovation industries such as 3D printing.¹³⁹ The 3D printing industry maintained that 'this case is about more than cheerleading uniforms'.¹⁴⁰ The amicus brief noted that '3D printing is already a significant industry and is expanding exponentially'.¹⁴¹ In its view, 'Continued confusion in this area of copyright law skews the balance between innovators and those claiming rights, hindering development in this growing field.'¹⁴² Outlining developments in 3D printing and the maker movement, the companies observed:

Ultimately, using digital technologies to make physical objects greatly increases the types of physical objects that people can create, while vastly increasing the number of people who can create them. The increasing accessibility of 3D printing encourages more people to share, distribute, and sell their physical creations to the global audience of the Internet.¹⁴³

The 3D printing companies also highlighted the materials revolution: 'The types of objects created by 3D printing are incredibly diverse, and users can work with a wide variety of materials, including precious metals, ceramic, or plastic.'¹⁴⁴

¹³⁶ Ibid.

¹³⁷ Ibid.

¹³⁸ Ibid.

¹³⁹ Ibid 5.

¹⁴⁰ Ibid.

¹⁴¹ Ibid.

¹⁴² Ibid.

¹⁴³ Ibid 8.

¹⁴⁴ Ibid.

The submission was concerned about the prevailing uncertainty about the application of copyright law to 3D printing:

The application of copyright law to 3D printing is sometimes clear. 3D printed objects that are purely ornamental and nonfunctional, such as an exact replica of a sculpture or a complex jewelry design, are protectable by copyright; designs that are purely functional useful articles, such as a basic wrench or a replacement gear, are not. In intermediate cases, however, the application is uncertain. A significant percentage of 3D printed objects combine utilitarian and artistic elements in complex ways. These mixed use objects engage copyright in a more involved manner and require distinguishing between the copyrightable subject matter and the noncopyrightable utilitarian elements.¹⁴⁵

The submission noted: ‘As the 3D printing industry expands, so will the number of copyright claims and disputes connected to physical objects that incorporate both creative and functional parts.’¹⁴⁶ The 3D printing companies commented: ‘The aggregate impact of such choices is to undermine the carefully calibrated scope of copyright protection created by Congress’.¹⁴⁷ They observed that ‘Ambiguity pushes the scope of copyright protection outward, unjustifiably stifling expression by bringing objects and elements ineligible for copyright protection within its reach’.¹⁴⁸ The 3D printing companies warned that such an approach undermined the larger public policy objectives of copyright law: ‘The public ultimately is deprived of access to creativity and objects that should rightfully be in the public domain or be, at the most, be protected only by patent.’¹⁴⁹

Second, the 3D printing companies observed that the current split surrounding conceptual separability is significant and chilling to innovation and creativity. The submission observed:

In the forty years since the enactment of the Copyright Act of 1976, courts have applied several conflicting tests for conceptual separability and generated irreconcilable differences in their interpretations of the statute. The current fractured state of circuit law regarding the separability of functional and artistic elements prevents individuals and companies engaged in the 3D printing industry from being able to accurately analyze the landscape of copyright protection. It also prevents responsible rights holders from properly exercising their rights and responsible

¹⁴⁵ Ibid 9.

¹⁴⁶ Ibid 10.

¹⁴⁷ Ibid 11.

¹⁴⁸ Ibid.

¹⁴⁹ Ibid 11.

designers from creating and innovating without interference from baseless but difficult-to-assess claims. Uncertainty inhibits the natural exchange of ideas as 3D printing becomes cramped by overreaching copyright protection. As this industry expands, trying to navigate multiple, conflicting rules for conceptual separability will chill innovation and creativity, increase litigation over copyrightability, disrupt the nationwide marketplace for mixed-use objects, and impose the costs of these inefficiencies on consumers.¹⁵⁰

The submission lamented that there had been a failure to address conceptual separability in a consistent and coherent way over the last 40 years. The 3D Printing companies feared that ‘the fractured state of the law surrounding conceptual separability is fundamentally at odds with congressional intent in passing the Copyright Act of 1976 to create a “single system of Federal statutory copyright.”’¹⁵¹

In conclusion, the 3D printing companies insisted: ‘The ability of users, innovators, 3D printing companies, and copyright owners to rely on a single, predictable test for conceptual separability is of great importance’.¹⁵² The industry observed: ‘This case is the ideal vehicle for the Court to resolve the damaging circuit split and provide that consistency and predictability’.¹⁵³ The industry pleaded with the Supreme Court of the United States:

This Court should grant certiorari to resolve the present circuit split and ensure that the development of innovative technologies and industries such as 3D printing is not hampered by the ongoing conflicts and confusion in conceptual separability doctrine.¹⁵⁴

The Supreme Court of the United States granted leave in the dispute, and heard oral arguments in 2016. A decision is due to be handed down in 2017. John Hornick and Carlos Rosario Tue wondered whether increased copyright lawsuits would be costly for consumers in the long-run: ‘We will be watching closely to see if the Supreme Court decides to make a bright-line test to determine whether an object is copyrightable when it possesses some functionality.’¹⁵⁵

¹⁵⁰ Ibid 11-12.

¹⁵¹ Ibid 15.

¹⁵² Ibid 19.

¹⁵³ Ibid.

¹⁵⁴ Ibid.

¹⁵⁵ John Hornick, ‘3D Printing Companies Petition the Supreme Court for Copyright Clarity’, *3D Printing Industry*, 8 March 2016 <<http://3dprintingindustry.com/2016/03/08/3d-printing-companies-petition-the-supreme-court-for-copyright-clarity/>>.

VI GAME OF THRONES: COPYRIGHT LAW AND INTERMEDIARY LIABILITY

3D printing has also tested the limits of the safe harbours regime set up under the *Digital Millennium Copyright Act* 1998 (US).

There have, though, already been controversies over copyright law, intermediary liability, the MakerBot. In 2011, Thomas Valenty used a MakerBot to design figurines - a war mecha and a tank for use in the game *Warhammer 40,000*.¹⁵⁶ He posted the files on Thingiverse, which allowed other fans to share the instructions for printing these 3D objects. Noting the files, the Games Workshop - the maker of *Warhammer 40,000* - sent a take-down notice to Thingiverse under the *Digital Millennium Copyright Act* 1998 (US). Clive Thompson observed of the conflict: 'Thingiverse removed the files, and Valenty suddenly became an unwilling combatant in the next digital war: the fight over copying physical objects.'¹⁵⁷ The creator argued that the takedown of the files was unjustified, observing: 'The models are mine. I created them from scratch ... This was "fan-art".'¹⁵⁸ Valenty noted: 'I believe the issue was with the distribution of the files that carry the likeness of their IP.'¹⁵⁹ This dispute between Thomas Valenty and the Games Workshop is a forerunner to future conflicts over copyright law, and 3D printing.

In addition to the controversy over LeftShark, Fernando Sosa has also been involved in a copyright dispute in respect of a 3D-printed Iron Throne dock.¹⁶⁰ He received a threatening letter from HBO, observing: 'While we appreciate the enthusiasm for the Series that appears to have inspired your creation of this device, we are also concerned that your iron throne dock will infringe on HBO's copyright in the Iron Throne.'¹⁶¹ The HBO Vice President of Corporate Affairs Jeff Cusson maintained that a 'pretty straightforward intellectual property infringement.'¹⁶²

HBO refused to allow for licensing of the Iron Throne by Sosa:

¹⁵⁶ Clive Thompson, '3D Printing's Forthcoming Legal Morass', *Wired*, 31 May 2012 <<http://www.wired.co.uk/news/archive/2012-05/31/3d-printing-copyright/>>.

¹⁵⁷ Ibid.

¹⁵⁸ Ibid.

¹⁵⁹ Ibid.

¹⁶⁰ Nathan Hurst, 'HBO Blocks 3-D Printed Game of Thrones iPhone Dock', *Wired Magazine*, 13 February 2013 <<http://www.wired.com/design/2013/02/got-hbo-cease-and-desist/>>.

¹⁶¹ Ibid.

¹⁶² Ibid.

Your company is too small at this time to warrant a license with HBO. We are operating a multi-million dollar licensing program and we seek licensees who have established track records, sound financial footing, experience in licensing and the ability to mass produce product and deliver it to retailers reliably. Your company does not meet those criteria.

The 3D printed products you have showed me lack the polish that we look for in licensed merchandise. We work with several licensees who use 3D printing to prototype products and we have seen the limits of the technology. It's our opinion that at this time, most 3D printed items that we see don't have the high quality we look for in our licensed merchandise. While injection molding is certainly far more expensive from a tooling and set-up perspective, the resulting product meets our production criteria and our partners can produce huge quantities at affordable prices with a good economy of scale. 3D printing is certainly growing in leaps and bounds, but right now the results just aren't good enough for us.¹⁶³

Sosa was non-plussed by the dispute: 'Fine, you don't want us to work with your throne, we'll make something cool, we'll make something better.'¹⁶⁴

There are larger pressures in respect of the regulation of intermediary liability – both for copyright law and other disciplines.¹⁶⁵

In the United States, there has been a review process in respect of the regime of safe harbours, and take-down and notice schemes. In April 2016, leading 3D printing companies like Makerbot, Shapeways, and Stratasys, and crowdfunding entities like Kickstarter made a submission on the regime.¹⁶⁶ The submission noted that '[Online Service Providers] are a critical platform for free speech and economy activity that empower individuals and small

¹⁶³ Michael Molitch-Hou, 'Politics and 3D Printing Make Strange Bedfellows: The Work of Fernando Sosa', *3D Printing Industry*, 8 January 2015 <<http://3dprintingindustry.com/2015/01/08/politics-3d-printing-make-strange-bedfellows-work-fernando-sosa/>>.

¹⁶⁴ Nathan Hurst, 'HBO Blocks 3-D Printed Game of Thrones iPhone Dock', *Wired Magazine*, 13 February 2013 <<http://www.wired.com/design/2013/02/got-hbo-cease-and-desist/>>.

¹⁶⁵ Kylie Pappalardo, 'Duty and Control in Intermediary Copyright Liability: An Australian Perspective' (2014) 4(1) *IP Theory* 9; Dan Hunter and Nicolas Suzor, 'Claiming the Moral High Ground in the Copyright Wars' in Phillipa McGuinness (ed.), *Copyfight: Firing Up Conversation about Copyright* (University of New South Wales Press, 2015) 131; Nicolas Suzor and Brian Fitzgerald, 'The Legitimacy of Graduated Response Schemes in Copyright Law' (2011) 34(1) *University of New South Wales Law Journal* 1; Annemarie Bridy, 'A User-Focused Commentary on the Trans-Pacific Partnership ISP Safe Harbors', *InfoJustice*, 23 November 2015 <<http://infojustice.org/archives/35402>>; Manila Principles on Intermediary Liability <<https://www.manilaprinciples.org/>>.

¹⁶⁶ Etsy, Foursquare, Kickstarter, Makerbot, Meetup, Shapeways, and Stratasys, 'In The Matter of Section 512 Study: Notice and Request for Public Comment', Docket No. 2015-7, <<https://www.shapeways.com/wordpress/wp-content/uploads/2016/04/Comment-of-Etsy-et-al-in-512-Study.pdf>>.

businesses to easily post content and connect to a global audience.¹⁶⁷ The online service providers explained some common concerns amongst the new digital economy:

OSPs key role in the online ecosystem derives in part from their mass accessibility. OSPs empower millions of users to create and publish content with a low barrier to entry. Before OSPs existed, people needed considerable resources to widely disseminate their content. Today, user generated-content reaches a global audience after simply accepting an OSP's terms of use.

However, with this mass accessibility comes a potential conflict affecting the free flow of ideas, the dissemination of innovation, and small business-fueled economic growth. When OSPs are exposed to liability for the content generated by their users, it restricts the OSPs' ability to support the freewheeling communities that have been the basis for so much economic, cultural, and political activity.¹⁶⁸

The 3D printing and crowdfunding companies observed that Congress has partially addressed the concerns through passing laws such as the online safe harbours of the *Digital Millennium Copyright Act 1998* (US), and Section 230 of the *Communications Decency Act*. The companies commented: 'While the practical implementation and use of copyright safe harbors have raised a number of important questions, Commenters focus this comment on a specific development that is distorting the notice and takedown process designed by Congress.'¹⁶⁹ The companies are worried by combination notices, which brought together copyright and trademark complaints: 'The increasingly common practice of combining allegations of trademark infringement with Section 512 copyright infringement notices effectively transforms a notice and counter notice process into a notice and stay down process.'¹⁷⁰

The companies stressed the importance of safe harbors in respect of intellectual property law: 'The Section 512 safe harbors allow Commenters to invest in improving and supporting their businesses without fear that a single infringing upload could result in debilitating copyright litigation.'¹⁷¹ The companies also warned that the 'safe harbors also give users the opportunity to dispute claims by overly aggressive rightsholders.'¹⁷²

¹⁶⁷ Ibid 1.

¹⁶⁸ Ibid.

¹⁶⁹ Ibid.

¹⁷⁰ Ibid.

¹⁷¹ Ibid 2

¹⁷² Ibid.

The companies observed that ‘safe harbors help protect against over-enforcement by allowing users to push back against problematic takedown requests.’¹⁷³ They commented that there were different perspectives between online service providers, and individuals. The companies noted:

Key to understanding the value of safe harbors is recognizing the differing viewpoints of OSPs and their users. OSPs – Commenters included – must consider the best interests of their entire user base when evaluating a request to take down an individual item. Within that rubric, it is often rational for OSPs to comply with a marginal, but colourable, request for any individual item to be taken down in order to protect the larger viability of the user base and avoid costly litigation.¹⁷⁴

The 3D printing companies and their associates said: ‘If OSPs had the security of safe harbor protections for non-copyright claims, OSPs could offer users the ability to push back against rightsholder claims.’¹⁷⁵ The 3D printing and crowdfunding companies are taking proactive policy action in respect of the question of intermediary liability.

VII COPYRIGHT LAW, DIGITAL LOCKS, AND 3D PRINTING

There has also been much policy discussion over copyright law, technological protection measures, and 3D printing. Such conflicts have tested the creaky, anachronistic framework for exceptions to technological protection measures laid down under the *Digital Millennium Copyright Act* 1998 (US).

Public Knowledge and the Electronic Frontier Foundation have petitioned the United States Copyright Office at the Library of Congress to provide an exemption to the prohibition on the circumvention of copyright protection systems for access control technologies.¹⁷⁶ The proponents sought an exemption for the users of 3D printers to engage in the use of non-manufacturer approved feedstock. The submission stressed:

The non-infringing use at issue is the access of programs designed to prevent the use of non-authorized feedstocks in 3D printers. As noted by the Sixth Circuit in *Lexmark*

¹⁷³ Ibid 5.

¹⁷⁴ Ibid.

¹⁷⁵ Ibid.

¹⁷⁶ Public Knowledge, ‘Petition for a Proposed Exemption under 17 USC 1201’, In the Matter of Exemption to Prohibition on Circumvention of Copyright Protection Systems for Access Control Technologies’,
3 November 2014
<http://copyright.gov/1201/2014/petitions/Public_Knowledge_2_1201_Initial_Submission_2014.pdf>.

International, Inc. v. Static Control Components, Inc., 387 F.3d 522 (2004), Congress did not intend for the DMCA to prevent consumers from using lawfully acquired consumer goods. The mere fact that copyright-protected programs are accessed in the use of a 3D printer or are used to verify feedstock in a 3D printer should not grant manufacturers the ability to control the use of those printers. While manufactures are free to condition offers such as warranties on the use of approved feedstocks, as well as obtain patents on specific feedstocks, it is improper for them to rely on Section 1201 to prohibit users of 3D printers from using alternative feedstocks.¹⁷⁷

Public Knowledge warned that ‘Interoperability, innovation, and consumer value are all negatively impacted by manufacturer-imposed feedstock restrictions in 3D printers.’¹⁷⁸ The group warned that ‘Preventing unauthorized feedstocks undermines larger innovation in the 3D printing world.’¹⁷⁹ In its view, ‘Materials innovation is one of the engines driving the 3D printing industry forward.’¹⁸⁰ Public Knowledge insisted: ‘While many 3D printer manufacturers make important contributions to 3D printable materials, they are not the only ones’.¹⁸¹ The group noted: “‘Outsider’ materials innovation, from the University of Washington’s recycled milk jug feedstock that created a 3D printed boat, to Rice University’s 3D printing of living tissues, should not be blocked by manufacturer-imposed limitations on printer use.’¹⁸² Public Knowledge hoped: ‘Opening the market to non-approved stocks helps increase consumer choice and value.’¹⁸³ The group contended: ‘Competitive feedstock manufacturers can offer users of 3D printers innovative new options.’¹⁸⁴ Public Knowledge argued that the move would be beneficial for consumer rights and competition: ‘Similarly, they can offer competitive options that drive down prices for existing feedstocks.’¹⁸⁵

Stratasys asked the US Copyright Office to deny a proposal that would legalise jailbreaking 3d printers in order to use your own feedstock.¹⁸⁶ The

¹⁷⁷ Ibid 3.

¹⁷⁸ Ibid 4.

¹⁷⁹ Ibid.

¹⁸⁰ Ibid.

¹⁸¹ Ibid.

¹⁸² Ibid.

¹⁸³ Ibid.

¹⁸⁴ Ibid.

¹⁸⁵ Ibid.

¹⁸⁶ Stratasys Ltd., ‘In Opposition to Proposed Class 26: Software or Firmware in 3D printers to allow use of Non-Manufacturer-Approved Feedstock’, In the Matter of Exemption to Prohibition on Circumvention of Copyright Protection Systems for Access Control Technologies’, 27 March 2015

company argued that ‘the proposed exemption would technological mechanisms that have supported the rapid innovation and increased adoption of 3D printing technologies among new classes of customers.’¹⁸⁷ Stratasys also maintained that the proposed exemption would also ‘diminish the ability of 3D printing systems to serve as secure hubs for the distribution of proprietary software and designs and for the collection of critical performance and manufacturing information’.¹⁸⁸

The Intellectual Property Owners Association also opposed the creation of an exemption in technological protection measures for 3D printing, arguing: ‘Manufacturers have invested substantial research and development funds predicated on business models that allow them to recoup and continue such investments.’¹⁸⁹ They stressed: “Bringing breakthrough technologies to market requires investments in the entire ecosystem of a 3D printer, including hardware, software, and materials, over a long-term development cycle.”¹⁹⁰ The Intellectual Property Owners Association feared: ‘Anticipated revenue from materials supports a reduction in the price of the initial printer and also supports the continued development of new and improved materials.’¹⁹¹ The industry lobby group concluded: ‘Because the proposed exemption would undermine technological measures that facilitate technological improvements, protect valuable property distributed through or stored on 3D printers, and provide incentives for vital research and development, we respectfully request that the Librarian and Register deny the proposed exemption for 3D printers.’¹⁹²

http://copyright.gov/1201/2015/comments-032715/class%2026/STRATASYS_Class26_1201_2014.pdf.

¹⁸⁷ Ibid.

¹⁸⁸ Ibid.

¹⁸⁹ Intellectual Property Owners Association, ‘In the Matter of Exemption to Prohibition on Circumvention of Copyright Protection Systems for Access Control Technologies under 17 USC 1201 – Sixth Triennial DMCA Rulemaking – Proposed Class 26’, 27 March 2015 <http://copyright.gov/1201/2015/comments-032715/class%2026/Intellectual_Property_Owners_Association_Class26_1201_2014.pdf>.

¹⁹⁰ Ibid.

¹⁹¹ Ibid.

¹⁹² Ibid.

In the end, the United States Copyright Office granted a very limited exception in respect of copyright law, circumvention, technological protection measures and 3D printing.¹⁹³

Disney has expressed the desire to develop an anti-copying device in respect of 3D printing.¹⁹⁴

Cory Doctorow has railed against the impact of technological protection measures.¹⁹⁵ As part of the Apollo 1201 initiative, he has united with the Electronic Frontier Foundation to call for the abolition of digital rights management systems and technological protection measures.¹⁹⁶

Under President Barack Obama, the *Trans-Pacific Partnership* had promoted the expansive protection of technological protection measures across the Pacific Rim. However, the new United States President Donald Trump has vowed to withdraw the United States from the agreement altogether.

VIII CONCLUSION

This article has reviewed a number of recent skirmishes in respect of copyright law and 3D printing. The conflicts have raised fundamental issues common to ‘information environmentalism’ – in respect of ecology, ‘the commons’, public choice theory, and welfare economics.¹⁹⁷ The dispute between Katy Perry and Fernando Sosa is symptomatic of the growing conflicts in respect of intellectual property law, and 3D printing in the United States. The dispute over LeftShark highlighted classic issues around copyright subsistence, copyright infringement, and copyright exceptions. The conflict over Michelangelo’s Statues was a strange assertion of copyright over public domain materials. This battle

¹⁹³ United States Copyright Office, ‘Proposed Class 26: Software – 3D Printers’, *Exemption to Prohibition on Circumvention of Copyright Systems for Access Control Technologies* (28 October 2015) 80(208) *Federal Register* 65958.

¹⁹⁴ ‘Disney Reveals Anti-Copying 3D Printing Tech Involving Embedded ID in Authorized Prints’, *3ders.org*, 14 March 2016 <<http://www.3ders.org/articles/20160314-disney-reveals-anti-copying-3d-printing-tech-involving-embedded-id-in-authorized-3d-prints.html>>.

¹⁹⁵ Mike Szczys, ‘Cory Doctorow Rails Against the Effect of DRM and the DMCA’, *Hackaday*, 8 August 2015 <<http://hackaday.com/2015/08/08/corey-doctorow-rails-against-the-effect-of-drm-and-the-dmca/>>.

¹⁹⁶ Electronic Frontier Foundation, ‘Cory Doctorow rejoins EFF to Eradicate DRM Everywhere’ (Press Release, 29 January 2015) <<https://www.eff.org/press/releases/cory-doctorow-rejoins-eff-eradicate-drm-everywhere>>.

¹⁹⁷ Robert Cunningham, *Information Environmentalism: A Governance Framework for Intellectual Property Rights* (Edward Elgar, 2014).

highlights the problems of copyfraud in the context of 3D printing. The action by the estate of Marcel Duchamp over the creators of a chess set was a complex matter. The legal conflict raised larger questions about copyright term, copyright subsistence, copyright infringement, copyright exceptions, and Internet jurisdiction. The intervention by 3D printing companies in the Supreme Court of the United States on the question of separability is an important development. The intermediary liability regime established by the *Digital Millennium Copyright Act* 1998 (US) has been tested by the sharing of 3D printing files. There have also been policy rules developed in respect of copyright law, technological protection measures, and 3D printing. Such conflicts highlight a larger tension between private property owners and the open commons of the maker movement.

In addition to creative activities, 3D printing offers new opportunities for designers working in a range of creative industries – such as art, craft, design, fashion, architecture, and products for consumers. Significantly, 3D printing also poses fundamental challenges for designs law, as well as offering opportunities. For instance, the *Designs Act* 2003 (Cth) in Australia provides exclusive rights to owners of registered designs – which relate to ‘the overall appearance of the product resulting from one or more visual features of the product’¹⁹⁸. A ‘visual feature, in relation to a product, includes the shape, configuration, pattern and ornamentation of the product.’¹⁹⁹ 3D printing of products may impinge upon registered designs related to the appearance of products. Simon Bradshaw, Adrian Bowyer, and Patrick Haufe have been hopeful that non-commercial 3D printing of designs would not infringe design rights: ‘Purely personal use of a 3D printer to make items will thus not infringe a registered design, so long as the purpose for which the item was made was genuinely non-commercial.’²⁰⁰ The spare parts exception will be the subject of much scrutiny in the age of 3D printing, making, and tinkering. The Advisory Council on Intellectual Property considered ‘the impact of new technologies on design protection’.²⁰¹ The Council concluded: ‘Consistent with the views of many stakeholders, ACIP considers that reform to address challenges posed by

¹⁹⁸ *Designs Act* 2003 (Cth).

¹⁹⁹ *Ibid.*

²⁰⁰ Simon Bradshaw, Adrian Bowyer and Patrick Haufe, ‘The Intellectual Property Implications of Low-Cost 3D Printing’ (2010) 7(1) *SCRIPTed* 5 <<http://www.law.ed.ac.uk/ahrc/script-ed/vol7-1/bradshaw.asp>>.

²⁰¹ Advisory Council on Intellectual Property, *Review of the Designs System* (Advisory Council on Intellectual Property, March 2015).

technologies such as 3D printing would be premature'.²⁰² Nonetheless, 3D printing provides for opportunities to reform and reinvent designs law, so that it is better adapted to contemporary design.

3D printing could also pose significant issues in respect of trade mark law. Michael Weinberg of Public Knowledge notes: 'If a 3D printer made a copy of an object and that copy included a trademark, the copy would infringe on the trademark.'²⁰³ There has been much debate over trade marks in respect of shapes. Conceivably, 3D printing could pose particular issues in respect of potential infringement of shape trade marks – and other three-dimensional trade marks. For instance, Apple's iconic products are protected, amongst other things, by shape trade marks. There could also be issues in respect of passing off and misleading and deceptive conduct – if there is confusion between products manufactured by 3D printing and the original models. Amanda Scardamaglia from Swinburne Law School provides an overview of some of the flashpoints in respect of 3D printing and trade mark law.²⁰⁴ She charted the tensions and conflicts in the field:

While there are some uses to which 3D printers can be put which may infringe the rights of trade mark owners, this is mostly at the perimeters. So although some commercial uses may impinge on the rights of trade mark owners, personal uses are less controversial. That is not to say that such uses are not objectionable to trade mark owners, who are concerned not just with consumer confusion but with the dilution of their brand and controlling all corners of their market.²⁰⁵

Amanda Scardamaglia comments: 'When it comes to the intersection of trade mark law and 3D printing, there is no reason to expect anything different. 3D printing therefore, is shaping up to be the next battleground for intellectual property law overreach, with trade mark law set to play a pivotal role.'²⁰⁶ She observed that 'if 3D printing does become our reality, a reality where consumers become makers, then trade mark owners will eventually have little choice but to embrace the new model of doing things.'²⁰⁷

²⁰² Ibid.

²⁰³ Michael Weinberg, *It Will Be Awesome If They Don't Screw It Up: 3D Printing, Intellectual Property, and the Fight over the Next Great Disruptive Technology* (Public Knowledge, November 2010) <<https://www.publicknowledge.org/files/docs/3DPrintingPaperPublicKnowledge.pdf>>.

²⁰⁴ Amanda Scardamaglia, 'Flashpoints in 3D Printing and Trade Mark Law' (2015) 23(2) *Journal of Law, Information and Science* 30.

²⁰⁵ Ibid.

²⁰⁶ Ibid.

²⁰⁷ Ibid.

In terms of patentable subject matter, 3D printing has a wide range of applications.²⁰⁸ The Supreme Court of the United States has sought to delimit the boundaries of eligible patentable subject matter in a string of cases – including *Bilski*, *Prometheus*, *Myriad*, and *Alice*.²⁰⁹ While some forms of 3D printing will be well within the boundaries of eligible patentable subject matter, particular 3D printing technologies in information technology, medicine, and biotechnology could be more contentious. Syzdek has suggested that there will be a gradual pattern of acceptance of 3D printing within the doctrines of patent law.²¹⁰ There has been significant patent litigation in the United States International Trade Commission in respect of 3D printing. ClearCorrect and ClearCorrect Pakistan was engaging in 3D printing in respect of the production of orthodontic appliances known as aligners. Align Technology Inc. alleged that to the International Trade Commission that there had been an infringement by ClearCorrect of various claims of 7 different patents. In *Clearcorrect Operating LLC v. ITC*. (2015), the United States Court of Appeals for the Federal Circuit was of the view that the jurisdiction of the International Trade Commission did not extend to electronically transmitted digital data.²¹¹ There have been significant concerns about the operation of patent infringement laws.²¹² Australia's patent laws, though, do have flexibilities for makers, tinkerers, and inventors.²¹³ The statutory defence of experimental use should provide protection for a range of activities undertaken by the members of the maker movement.²¹⁴

There are also significant issues in respect of 3D printing, contract law, and confidential information. The World Intellectual Property Organization has highlighted tensions between industrial 3D printing and personal 3D Printing, and between an open source philosophy, and proprietary approaches: 'The

²⁰⁸ Deven Desai and Gerard Magliocca, 'Patents Meet Napster: 3D Printing and the Digitization of Things' (2014) 102 *Georgetown Law Journal* 1691.

²⁰⁹ *Alice Corp v CLS Bank International*, 134 S Ct 2347 (2014); *Association for Molecular Pathology v Myriad Genetics Inc*, 133 S Ct 2107 (2013); *Bilski v Kappos*, 561 US 593 (2010); *Mayo Collaborative Services v Prometheus Laboratories Inc*, 132 S Ct 1289 (2012).

²¹⁰ Nicole Syzdek, 'Five Stages of Patent Grief to Achieve 3D Printing Acceptance' (2015) 49 *University of San Francisco Law Review* 335.

²¹¹ *Clearcorrect Operating LLC v ITC* (Fed Cir, No 2014-1527, 10 November 2015) <https://www.eff.org/files/2015/11/10/clearcorrect_v_itc_-_opinion.pdf>.

²¹² Jane Nielsen, John Liddicoat and Dianne Nicol, 'The Fabrication of New Patent Infringement Issues Through 3D Printing and CAD File Creation' (Paper presented at the Intellectual Property and Information Environmentalism Conference, University of Western Australia, February 2016).

²¹³ *Intellectual Property Laws Amendment (Raising the Bar) Act 2012* (Cth).

²¹⁴ *Patents Act 1990* (Cth)s 119C. For a history of the debate, see Matthew Rimmer, 'The Freedom To Tinker: Patent Law and Experimental Use' (2005) 15(2) *Expert Opinion on Therapeutic Patents* 167.

personal 3D printing ecosystem was built around the open sharing philosophy, while its industrial counterparts relied – and continue to rely – on proprietary knowledge and technologies to advance innovation.²¹⁵ WIPO comments: ‘Any further innovation in this area may involve open- source codes which may then be incorporated into proprietary, closed, hardware.’²¹⁶ Jarkko Moilanen, Angela Daly, Ramon Lobato, and Darcy Allen have undertaken empirical research into ‘Cultures of Sharing in 3D Printing.’²¹⁷ Such a study has highlighted the ways in which Creative Commons have been adapted and applied to help support the sharing of files in the Thingiverse.

Discussing the impact of 3D printing, Professor Mark Lemley of Stanford Law School has warned that there will profound challenges to intellectual property law in a post-scarcity economy:

The Internet is a harbinger of things to come—of a raft of new technologies that offer the promise of separating creativity from production and distribution, and reducing the cost of all three. Those technologies challenge the basis for our IP system, and indeed the basis for our economy as a whole.²¹⁸

The 3D Printing community should play an active part in the policy debate over intellectual property law reform. Michael Weinberg has emphasized that ‘it is critical for today’s 3D printing community, tucked away in garages, hackerspaces, and labs, to keep a vigilant eye on these policy debates as they grow.’²¹⁹ He recommended that ‘the community must work to educate policy makers and the public about the benefits of widespread access.’²²⁰

²¹⁵ World Intellectual Property Organization, *World IP Report: Breakthrough Innovation and Economic Growth* (World Intellectual Property Organization, 2015) <http://www.wipo.int/export/sites/www/econ_stat/en/economics/wipr/pdf/wipr_2015_chapter3.pdf>.

²¹⁶ Ibid.

²¹⁷ Jarkko Moilanen et al, ‘Cultures of sharing in 3D printing: what can we learn from the licence choices of Thingiverse users?’ (2015) 6 *Journal of Peer Production* <<http://peerproduction.net/issues/issue-6-disruption-and-the-law/peer-reviewed-articles/cultures-of-sharing-in-thingiverse-what-can-we-learn-from-the-licence-choices-of-thingiverse-users/>>.

²¹⁸ Mark Lemley, ‘IP in a World without Scarcity’ (2015) 90(2) *New York University Law Review* 461, 515.

²¹⁹ Michael Weinberg, *It Will Be Awesome If They Don’t Screw It Up: 3D Printing, Intellectual Property, and the Fight over the Next Great Disruptive Technology*, Washington DC: Public Knowledge, 2010, 15, <<https://www.publicknowledge.org/files/docs/3DPrintingPaperPublicKnowledge.pdf>>.

²²⁰ Ibid 15.