

## Copyrights in Higher Education: Motivating a Research Agenda

### IHELG Monograph

18-09

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(forthcoming, *Journal of Technology Transfer*)

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## **Copyrights in Higher Education: Motivating a Research Agenda**

### **Abstract**

The Bayh-Dole Act of 1980 enabled American universities to engage in technology transfer. Thirty years of research has investigated the legislation's effectiveness and derivative university practices, such as the establishment of technology transfer offices. Unfortunately, the technology transfer literature has focused primarily on patenting as the primary transfer vehicle for protecting intellectual property in universities, overlooking other forms of IP ownership, such as copyrights. Legal scholarship shows, however, that universities are increasingly using copyrights to protect their intellectual property and that the number of university-held copyrights exceeds patents. This paper examines the use of copyrights to protect and transfer university IP. It does so by reviewing underlying legal and policy concepts associated with copyrights and offers contemporary examples of copyright issues within universities. The paper therefore provides a foundation for future research on the role of copyrights in technology transfer.

**Keywords:** copyrights; technology transfer; Bayh-Dole Act; intellectual property; knowledge exchange; law; patents; legal research

**JEL classification:** O32, O34, O38

# Copyrights in Higher Education: Motivating a Research Agenda

## 1 Introduction

The transfer and commercialization of technologies stemming from university research is an important driver of economic and social development. The Bayh-Dole Act of 1980 (Public Law 96-517, December 12) enabled American research universities to engage in these activities. For the past 30 years, scholars have focused on the effectiveness of the Act as well as derivative university practices, such as the creation of intellectual property (IP) policies and establishment of technology transfer offices (TTOs) (Leyden and Link 2015). With the availability of data in response to the Act—thanks to organizations such as the Association of University Technology Managers (AUTM), and data obtained from the U.S. Patent and Trademark Office (USPTO)—this research resulted in a body of literature with significant management and policy relevance (Bradley et al. 2013; Phan and Siegel 2006; Rothermael et al. 2007).

A recent comprehensive review of the technology transfer literature finds, however, that most studies conceptualize technology transfer linearly and focus on patents as the primary vehicle for protecting university IP (Bradley et al. 2013; Hayter 2016a). Within this view, technology transfer is comprised of invention, disclosure, and patent filing, ending with licensure to industry, or the creation of a spinoff company (Hayter 2016b). Unfortunately, a linear, patent-centric perspective not only overlooks many facets of technology transfer in practice, it has also yet to consider other forms of IP ownership, such as copyrights (Rooksby 2016a). Given the Bayh-Dole Act's emphasis on patenting, extant data on copyrights have simply not been assembled in a form accessible to scholars.

In this paper, we hope to energize research into copyright as a distinct form of technology transfer. At least two contemporary factors are motivational. First, some scholars have recently

viewed copyright as a deliberate IP strategy (e.g., Veugelers and Scheider *forthcoming*) or proxy for commercial performance (e.g., Goel et al. 2015; Siegel and Wessner 2010) among knowledge-based firms.<sup>1</sup> Second, legal scholars have highlighted that the number of university-held copyrights overwhelmingly exceeds the number of patents (Rooksby 2016b).

The volume of copyrights at universities relates to mechanics underlying their role in IP protection. Unlike patents, copyright protection attaches ‘automatically’ once original expressions are fixed in a tangible medium of expression—from digital photographs and research papers to original expressions scribbled on a cocktail napkin. Thus, when copyrights are viewed as a distinct form of technology transfer within the institutional context of a university, we can understand better the dissemination and commercialization of university technologies. This paper serves as a primer to guide future investigations into copyrights within the university context.

The remainder of the paper is organized as follows. Section 2 provides a foundational explanation of copyright law, policy, and usage in the U.S., as well as describes how copyrights are enforced. Section 3 discusses the role of copyrights in colleges and universities, including contemporary policy issues and controversies that involve both faculty and students. Section 4 outlines a research agenda that examines the role of copyrights within the context of research universities in order to examine the technology transfer literature. Section 5 concludes the paper with summary remarks.

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<sup>1</sup> Copyrights are often included in science policy scholarship among other types of IP protection, especially patenting, as an important consideration for institutional policy or firm strategy. A keyword search of the term “copyright” in *Journal of Technology Transfer and Research Policy*, for example, yields various responses. A closer examination of returned articles reveals that while scholars use copyright as, for example, an important output among knowledge-based firms (e.g., Bergmann 2017; Siegel and Wessner 2012), little effort is devoted to understanding *how* and *why* they do so.

## 2 Copyright Laws and Enforcement

### 2.1 Introduction to Copyright

Copyright law in the United States is a legal mechanism that allows authors to protect their original works of expression from being copied. In addition to patent protection, copyrights are one of the two IP regimes specifically mentioned in the Constitution. Federal law, as opposed to state law, exclusively governs the creation and enforcement of copyrights.

Copyright protection in the United States has its roots in the Statute of Anne, passed in the United Kingdom in 1710, which was the first law in the world that provided copyright-like rights to authors. The Statute’s formal title, “An Act for the Encouragement of Learning,” illustrates the law’s focus on education and the promotion of a vibrant public commons for the creation and exchange of information. The Statute of Anne directly influenced the establishment of Art. I, Sec. 8, Cl. 8 within the U.S. Constitution, which aims to promote “science . . . by securing for limited times to authors . . . the exclusive right to their respective writings.” Legislation—such as the Copyright Act of 1790 and its subsequent revisions in 1909, 1976, and 1998—created the legal basics of contemporary copyright law, which have been interpreted and refined by courts.<sup>2</sup>

Copyrights protect original expressions, profound or mundane, that are fixed in a tangible medium of expression. Everything from words on a page, to graphical depictions on a canvas, to images on a screen, to 1’s and 0’s on a microchip meet this requirement, and therefore are subject to copyright protection to the extent they are original. Literary works; musical works; dramatic

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<sup>2</sup> Much of the Copyright Act is technical in nature, and the subject of intense lobbying by interested groups (e.g., the recording industry, the movie industry, book publishers, and rights management groups). The Copyright Act of 1976 represented the biggest shift in copyright law in the United States, and was the result of years of lobbying and hearings in Congress (Crews 1993). While additional tweaks to the law have been made since—for example, the revisions in 1998 extended the term of copyright protection—the fundamental underpinnings remain firmly established. Federal circuit courts do play important roles, though, in refining how the law applies in emerging technological and contested areas. Unsurprisingly, the federal circuit courts whose jurisdictions cover California and New York—two states that house the majority of ‘content’ companies in the United States—have been particularly influential in interpreting copyright law.

works; choreographic works; pictorial, graphical, and sculptural works; motion pictures and other audiovisual works; and architectural works are all potentially subject to copyright protection (17 U.S.C. § 102(a)).

Copyright law is non-discriminatory in its application. High-art, low-art, and everything in between is subject to copyright protection so long as the baseline elements of protection are met. In short, the law does not require that a work be elegant, memorable, or unique to the world in order for copyright protection to attach. While popular novels, movies, and music all are subject to copyright protection, so too are emails, instruction manuals, and organizational bylaws, provided that these works are sufficiently original and do not constitute merely an idea, procedure, process, system, or method of operation (17 U.S.C. § 102(b)).

Copyrights are best thought of as not one but rather a bundle of rights. These rights include the right to reproduce the copyrighted work, the right to distribute it, the right to display it publicly, and the right to prepare derivatives, or adaptations, of it. Each of these protections can be separately licensed, or exploited, through commercial relationships.

## **2.2 Ownership and Duration of Copyright Protection**

The 1909 Act created several guidelines for copyright policy that lasted until the revision of the Act in 1976. For example, under the 1909 Act, authors risked losing rights in their works if they did not seek registration or publish their works with an accompanying copyright notice. Copyrighted work lost its copyright protection 28 years from publication unless a renewal was timely filed with the United States Copyright Office, in which case the copyright lasted for another 28-year term. At the expiration of the second term, or if no renewal term was sought, the work would pass into the public domain.

The 1976 Act, which went into effect in 1978, eliminated many of the guidelines established in 1909 (Sprigman 2004). Under the current law, copyright protection attaches automatically upon fixation, regardless of whether one appends a copyright notice or symbol to the work. Formal registration was made optional but, as discussed below, it became a prerequisite to sue for infringement. The requirement for authors to file for copyright renewal was removed by the 1976 Act, but the duration of copyright protection was extended, most recently by the legislation passed by Congress in 1998.

Today, for an author who creates a work not subject to an employment agreement, the author enjoys copyright protection from the time of its creation through the author's lifetime; the work retains copyright protection for an additional 70 years after the author's death. Works created in furtherance of one's employment are called "works made for hire" (WMFH), and the term of protection for those works is different. Copyright in WMFH lasts for 120 years from the date of the work's creation, or 95 years from first publication, whichever expires first. Because copyright protection automatically vests in the author once a copyright-eligible work becomes fixed in a tangible medium—without regard to registration, or giving notice of the claim of the copyright—contemporary works will be slow to enter the public domain.

### **2.3 Copyright Registration, Enforcement, and Statutory Damages**

The copyright registration process can be completed online with the U.S. Copyright Office, without the aid of an attorney, and is inexpensive compared to the costs involved in obtaining other IP rights.<sup>3</sup> The official governmental registration fee currently ranges from \$35 to \$85 per work,

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<sup>3</sup> By way of comparison, utility patents are much more expensive to obtain. The cheapest governmental fee that a small organization will pay to obtain a patent is \$1,210, and that cost goes up to several thousand dollars depending on the size of the applicant's organization and the complexity of the patent (see <https://www.uspto.gov/learning-and-resources/fees-and-payment/uspto-fee-schedule#Patent%20Fees>). These costs do not take into account attorney fees in prosecuting a patent. Whereas copyright registrations may be obtained without the assistance of an attorney (and commonly are), only a member of the 'patent bar' may prosecute a patent application. A 2017 survey of patent practitioners found that the average cost to prosecute a utility patent application, on an invention of minimal

depending on the complexity of the filing. Authors must submit a copy of the work they wish to register, although the office's review of the work is minimal.

While obtaining registration of one's copyright is optional, obtaining a copyright registration certificate from the Copyright Office is a prerequisite to suing for copyright infringement. Registering the work soon after fixation in a tangible medium provides certain benefits to its owner. For example, attorneys' fees and statutory damages are available to a copyright owner who registers her work three months after first publication of it, or one month after she learns of its infringement, whichever is earlier (17 U.S.C. § 412).

Statutory damages differ from actual damages. Statutory damages allow a court to presume damage from the mere fact that infringement occurred, without requiring the plaintiff to establish actual harm. Proving actual damages can be difficult—expert testimony typically is required, and experts often disagree on the extent to which the copyright owner has actually been damaged by another's infringement. Ultimately, a jury decides the appropriate damages to award, and there, too, much is left open to chance and the persuasiveness of attorney arguments. By comparison, statutory damages are set by statute: not less than \$750 or more than \$30,000 for each work infringed, as the court considers just (17 U.S.C. § 504). The \$30,000 maximum figure can be increased to \$150,000 if the court finds that the infringement was committed intentionally—that is, the infringer knew of the copyright owner's copyright in the work, and proceeded to copy it without permission.

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complexity, was \$8,523 (AIPLA 2017). The actual cost was over \$11,000 in some jurisdictions. Patent applicants will pay additional fees (in the thousands of dollars) to attorneys to amend the application or respond to arguments made during examination. If the patent issues, they will also have to pay 'maintenance fees' ranging from \$3,150 to \$12,600 (depending on the size of the patent owner's organization) to maintain the patent for the duration of its term.

Statutory damages are an important feature of copyright law, because many copyrights have low market value. Without statutory damages, one could infringe low-value copyrights with impunity, as actual damages are speculative or can be difficult to establish for certain kinds of works. Statutory damages help recognize the important contributions of authorship to the creation of new works.

## **2.4 Fair Use**

Fair use is a statutory provision within the 1976 Act that permits the public to make unlicensed uses of copyrighted works in certain instances. This feature of the law is important, particularly for those who work in creative industries, such as documentary film, and frequently incorporate works owned by others as part of the content of their new works. A guiding motivation behind the fair use provision is that some uses of copyrighted works are necessary in order for authors to contribute to a vibrant cultural commons, where people are free to comment on, criticize, and use in some fashion existing works protected by copyright. For example, authors of book reviews would be unable to quote from the books they are reviewing if fair use did not protect some limited, verbatim uses of text from the original. Of course, a purported review that quotes an entire chapter, followed by the words “I don’t like it, don’t read it,” would not be protected by fair use.

Many unlicensed uses of copyrighted work do not take effect to the benefit of the copyright holder. In fact, the copyright holder may prefer that one does not use her work, or that one at least pay a licensing fee for the privilege of doing so. Without a fair use doctrine, rights holders would always be able to dictate the uses to which their works could be put, and the terms. In other words, some uses, even if socially valuable, would be prohibited by rights holders, which runs counter to the vision of the Founding Fathers as expressed in the IP clause of the U.S. Constitution.

The 1976 Act sets out specific nonexclusive criteria that courts must consider in determining whether an alleged infringement is protected by fair use (17 U.S.C. § 107). These four criteria for fair use include:

1. purpose and character of the use: favored uses are ones that transform the purpose of the original work, or imbue it with new meaning or understanding;
2. nature of the copyrighted work: uses of factual works are favored, compared to uses of highly creative works;
3. amount and substantiality of the portion used in relation to the copyrighted work: minimal copying is favored, unless one needs access to more of the original so that others realize the second author is commenting on the original; and
4. effect upon the potential market for or value of the copyrighted work: uses that disrupt established licensing markets are disfavored.

Resolution of these factors is fact specific, and no single factor is dispositive. Other language in the statute suggests that some uses are presumptively favored, including uses “for purposes such as criticism, comment, news reporting, teaching (including multiple copies for classroom use), scholarship, or research.” Examples include the quotation of copyrighted work in scholarship and the display of copyrighted work in newscasts.

However, interpretation of these criteria is generally left to the courts, and the specific weight these uses should be given in a legal analysis of fair use is unclear. Some courts have been restrictive in their application of fair use even in these presumably favored instances. Further, case law provides few clear guideposts for prospective users of copyrighted material. Courts are reluctant to determine that certain quantitative uses of copyrighted material are presumptively fair, despite the urging of parties in a variety of lawsuits to make such pronouncements.

### **3 Copyright and Universities**

Hayter and Rooksby (2015) and Rooksby (2016a) posit that while the extant literature that examines the effect of the Bayh-Dole Act in technology transfer is large and growing, these studies of Bayh-Dole overlook important legal and policy considerations such as the impact of case law

on technology transfer practices and policy.<sup>4</sup> Failing to take these contextual issues into account might lead to a misleading or inaccurate understanding of university technology transfer (Autio et al. 2014; Bradley et al. 2013). The remainder of this section provides historical and legal context relating to the role of copyright protection in universities. The subsequent sections illustrate contemporary IP ownership issues associated with copyrights, including the ownership of faculty-generated instructional materials as well as the ownership of materials generated by students during their classes and in the context of their entrepreneurial endeavors.

### **3.1 Legal Background: Ownership of Academic Works in Universities**

The question of who owns scholarly work—professors or institutions—has animated legal scholarship for decades. While the WMFH provision, first introduced in the 1909 Copyright Law, functions to vest most employers with ownership over their employees’ copyrightable works, custom, tradition, and old court cases, including from other national contexts, suggested that a “teacher’s exception” to employer ownership of copyrights existed in higher education. The teacher’s exception, validated in *Williams v. Weisser*, 78 Cal. Rptr. 542 (Ct. App. 1969), held that faculty usually owned their intellectual output.

The 1976 Act did not mention the teacher’s exception; thus, legal scholars subsequently debated whether it survived the updated legislation. Interpretation of this legislation is important because it determined who owned the intellectual outputs, including teaching materials and publications, of faculty: universities or faculty themselves (Rooksby 2016a). Despite previous

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<sup>4</sup> See, for example, Hayter and Rooksby’s (2016) discussion of the Supreme Court case *Board of Trustees of the Leland Stanford Junior University v. Roche Molecular Systems, Inc.* The case not only led many universities to rewrite faculty employment contracts, it also supported arguments that universities have the legal flexibility to choose multiple paradigms of IP ownership, including faculty, government, and third-party ownership, that might lead to better technology dissemination and commercialization outcomes (Hayter 2015).

court rulings that held faculty owned their intellectual outputs, interpretations of the law changed over time in favor of university ownership. Examples below explain how and why.

### **3.2. Ownership of Faculty-generated Instructional Materials**

In support of traditional tenets of academic freedom, universities have long held that faculty are not only responsible for the design and delivery of courses, they also ‘own’ their respective curricula and other supporting instructional materials. Faculty ownership philosophies are typically embodied in university policies and some, although not all, of these policies take the position that faculty teaching and scholarship are exceptions to the WMFH designation of employee works discussed above. However, despite repeated requests from the American Association of University Professors (AAUP), faculty ownership of IP, including instructional works, is not clearly codified in federal law. Therefore, case law has played an important role in determining ownership of faculty-generated materials, and the weight of authority—in addition to scholarly commentary (Rooksby 2016c)—suggests that faculty teaching and scholarship materials are WMFH, presumptively owned by universities unless universities have assigned such material back to faculty in a written policy or assignment agreement.

In contrast to traditional faculty ownership assumptions, the emergence of online education through for-credit courses and massively-open online courses (MOOCs) demonstrates a trend whereby universities and third-party service providers are asking faculty to sign over copyrights to instructional works. Such requests are often motivated by faculty use of university facilities, staff, and funding to produce high-quality audio or video content, as well as the intention to use the university brand to market the course (Rosini 2014). These investments are required to scale instruction among thousands of students over long periods of time (Kolowich 2013).

When a college or university owns course copyrights, it has the freedom to re-offer the course, revise it, and license its use by others (Lye and Vernon 2014). Further, the university can transfer its ownership to a third party, which is often a requirement of partnerships with online education companies such as edX and Coursera (Kolowich 2013; 2016).

Faculty concerns over copyright assignment include the university's ability to modify and transfer course materials without seeking the instructor's approval, and not paying additional compensation to the instructor for the institution's continued use of the course. Some faculty also fear that they may not be able to use materials they developed without a license or permission from the university, or that they may be prevented from creating derivative works from their original works. Worst case, faculty face the threat of copyright infringement litigation if they were to do so (Lye and Vernon 2014). Further, even when universities have clear faculty-centric copyright ownership policies, these do not prevent courts from deeming courses created by faculty as WMFH (e.g., *Manning v. Board of Trustees of Community College District No. 505*, 109 F. Supp. 2d 976 (C.D. Ill. 2000)).

### **3.3 Ownership of Student-created Materials**

Scholars have recently drawn attention to the role of students in technology transfer, including the growth of programs and policies meant to encourage and support student entrepreneurship activities (e.g., Hayter et al. 2017; Rasmussen and Sorheim 2006; Wright et al. 2017). These efforts include entrepreneurship classes and majors, innovation-related design and development projects, specialized equipment for product design and prototyping, business plan competitions, and incubators for student businesses. Nearly all works stemming from these efforts are subject to copyright protection, such as the development of mobile phone apps and other forms

of software that often are ineligible for patent protection. Thus, student-centric entrepreneurship efforts place heightened focus on the value and potential of their IP (Rooksby 2016b).

However, student copyright ownership policies at many universities either do not exist or are unclear and confusing, often leading to high-profile cases of student-university conflict (Luppino 2009). For example, in 2009, students at the University of Missouri at Columbia won a business plan competition sponsored by the university's journalism school. The winning student team developed an app called NearBuy, which matched students looking for housing with those in the area willing to provide it. The students established a startup company to further develop and market the app (Rae 2011).

The student spinoff was initially successful, generating over 250,000 downloads on Apple's App Store. Once the university learned of the success of NearBuy, however, its attorneys informed the students that they were required to sign over a 25 percent ownership stake in the company and two-thirds of any profits. The university's demands were based on an interpretation of its IP policy, which did not clearly contemplate student ownership of this type of copyright. In reaction to substantial negative publicity, however, the university revised its IP policy, specifying that students generally own IP stemming from school-sponsored contests, extracurricular activities, and individual initiatives. However, the university's policy retained a substantial caveat: the university can assert ownership when a student develops IP under a professor's supervision, using substantial institutional resources, or grant money (Zagier 2011).

Industry involvement in classes, such as engineering capstone courses, undergraduate business courses, independent study, or service-learning projects also highlights policy tensions associated with research, technology transfer, and copyright. Certainly, industry involvement in courses can provide students with networks and experiences that enable their future success.

However, company involvement can come at a price. Howe (2010) finds, for example, that many corporate participants in engineering capstone courses require some transfer of IP rights from students, and that this number has been growing over time, from 40 percent of programs in 1994 to 64 percent in 2005. Not only might these IP arrangements compromise students' academic freedom, these courses are often required of them to complete their degrees (Pilz 2012; Quizon 2015). The effect is that students can be forced, as a condition of graduation, to relinquish legal rights to their work. In short, companies increasingly have access to and ownership of student-generated IP stemming from various venues within colleges and universities.

#### **4 Copyrights and Universities: A Research Agenda**

While a modest literature on copyrights exists within the field of law (see Rooksby 2016a, 2016c), empirical examination of their role within the context of university technology transfer is lacking (Crews 1993). Similarly, beyond surface treatments of copyright, we find little discussion of their use within the higher education and science policy literatures. In short, following Hayter and Rooksby (2015), while legal scholars have outlined issues associated with copyright policy in universities, an exceptional opportunity exists for scholars to examine copyrights not only as a form of IP protection, but also its role in technology transfer.

Understanding copyrights within the university context—including their use, attendant policies, and associated litigation—is not only valuable given the underdeveloped nature of the research topic, but also is of critical importance to the heightened emphasis among policymakers on maximizing “return on investment” to academic research, especially as that metric relates to economic growth and dynamism. Further, while many conceptual lenses are available to frame these questions, we believe that knowledge-based views (e.g., Ács et al. 2009; Braunerhjelm et al. 2010; Braunerhjelm et al. 2016) are especially promising. Within this context, scholars may

broadly frame their investigations to understand the role of copyright in the dissemination and commercialization of new knowledge generated in universities, as well as the extent to which copyright policies and approaches enable or constrain knowledge exchange.

Though the challenges of using IP as a proxy for economic and social development—especially patents—are well established within the literature (see, for example, Pakes and Griliches 1980; Hall et al. 2014), the topic is also relevant to discussions related to the relationship between specific IP management techniques and the public disclosure and eventual creation and use of new knowledge, which is the original intent of copyright and patenting (Frischman and Lemley 2007; Madison et al. 2009). Only by grappling with these questions can scholars understand the various copyright activities among colleges and universities, and how these activities can enhance or impede knowledge exchange. The sections below focus on three especially promising avenues for research relating to copyrights and their role in university knowledge transfer.

#### **4.1 Use of Copyright Protection by Universities**

Legal scholarship shows that universities frequently use copyright protection to protect works created by faculty and students (Rooksby 2016c). Copyright issues frequently impact universities because common intellectual outputs from students and faculty—from student papers, course curricula, apps and other forms of software, to art and design projects—are subject to copyright protection. Thus, scholars might ask how and why do universities employ copyright protection? And to what extent do universities view copyrights as an important aspect of management and policy, especially related to technology transfer?

Scholars might begin addressing these research questions through descriptive analyses of copyright claims among research universities. One promising route is through administrative data. The U.S. Copyright Office maintains online records of all copyright registrations, with several

searchable fields. As illustrated in Table 1, registration information available through the U.S. Copyright Office’s online database includes the registrant’s name, date of registration, type of copyrighted work, and title of copyrighted work.<sup>5</sup>

**<Insert Table 1 About Here>**

Information provided by the record differs depending on the category of work in question. In addition to “text” category of work, other categories commonly registered by universities include computer file, dramatic work, map, mask work, motion picture, sound recording, music, visual material, and serial publication. Many copyright entries also indicate how the copyright claimant (for our purposes, the university) came to own the work in question. Typical scenarios are WMFH, written assignment, and no indication (the designation for the example illustrated in Table 1).

Scholars might use this information to understand the types of categories of works registered by universities (text, music, computer file, etc.); the number of works registered per year by universities; the nature of universities’ ownership claims in the registered works (WMFH, written assignment, no indication); and the nature of the individual works registered by universities. For example, through searching the Title field of the prospective data set, researchers would be able to determine the number of works registered by universities that incorporate terms

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<sup>5</sup> Unfortunately, the government’s copyright database is neither user friendly nor easily manipulated for analysis. First, conducting custom searches is time intensive, given the interface of the online database. For example, when hundreds or thousands of records meet a given search criterion, not all records are displayed on one page. Second, each record must be examined individually to capture and transcribe the data of interest—the data cannot be downloaded in the aggregate. Third, a high degree of variation exists in *how* registration data has been entered in the online database, because of different practices deployed by the U.S. Copyright Office through the years, as well as idiosyncratic preferences or habits of the different librarians entering the records. Fortunately, alternatives to searching in the copyright database have recently become available, such as LexisNexis’s database of over 32 million copyright registrations available for searching (see <https://www.lexisnexis.com/infopro/keeping-current/b/weblog/archive/2017/08/03/copyrights-amp-trademarks-registrations-added-to-lexis-advance-ip-library.aspx>). We leave it to future work to describe the best approaches to shepherding the data we call for here.

of interest, such as “software,” “app,” or “mobile.” Doing so would support investigations focused on how copyright protection is deployed in higher education.

Copyright registrations might also be explored by type of research institution. For example, an examination of the dozens of copyrights held by the California Institute of Technology reveals registrations for semiconductor mask work (detailed three-dimensional representations of semiconductor components), GPS satellite orbit analysis software, and so-called arithmetic stack software enabling more efficient computing chip processing. As further example, the College of William and Mary holds at least 26 registrations to educational curricula ranging from language arts for 7<sup>th</sup>-graders to electrical system design for baccalaureate students.

Descriptive analyses of copyright usage might be supplemented with case studies and survey data collected from university personnel. While such data collection might logically include TTOs, faculty, students, and administrators, it might also include other university personnel who are typically not the subject of technology transfer research. For example, scholars (Crews 1993; Rooksby 2016a) have described the role of librarians in the drafting, maintenance, and enforcement of university copyright policies.<sup>6</sup>

Finally, once scholars have a firm grasp on how and why universities use copyright protection, they might fruitfully make comparisons to the use of patent protection. While such a comparison might not invoke new policy, it might engender future research into how universities deploy IP protections more broadly. To what extent are copyrights and patents complements? Or to what extent, as is sometimes the case in software (e.g., de Laat 2005), might they be substitutes?

## **4.2 University Copyright Policies**

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<sup>6</sup> In addition to any inhouse lawyer at a university who focuses on copyright law, librarians tend to be among the most knowledgeable people on campus concerning copyright. This connection between librarians and copyright should not be surprising, given that the U.S. Copyright Office is housed within the Library of Congress.

In addition to understanding how and why universities use copyright protection, scholars might also investigate the extent to and manners in which copyrights are contemplated within institutional IP policies. While these policies typically focus on patenting, they also tend to address how institutions orient their approaches to faculty, student, and institution-owned copyrights (Crews 1993). University IP policies generally are publicly viewable, on institutional websites, and thus are easily assessable.

Future scholarship might thus examine institutional copyright policy using these sources to understand how copyright policy differs (if it exists) among colleges and universities. Further, how does copyright policy differ by faculty, students, administrators, and other university personnel? And, following the aforementioned questions relating to university personnel, who is responsible for establishing, managing, and enforcing these policies?

Finally, how do university IP policies treat copyrights relative to patents with regard to faculty, postdoc, and student ownership and revenue sharing, among other characteristics? These policies might show that universities are more concerned with copyright in certain areas (e.g., software development) than in others (e.g., digital humanities projects). Related, copyright policies might be analyzed within the context of legal debates described above, such as the tension between notions that faculty and students own their intellectual works and WMFH arguments.

### **4.3 Legal Perspectives on University Copyright Ownership, Use, and Enforcement**

In the absence of federal guidelines regarding treatment of faculty and students under copyright law, including related issues of fair use,<sup>7</sup> the prevalence of IP-related lawsuits

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<sup>7</sup> In their teaching and research capacities, professors often utilize copyrighted materials for purposes of teaching, commentary, and scholarship. However, recent case law involving universities demonstrates that the doctrine of fair use does have limits in the educational context (*Cambridge Univ. Press v. Patton*, 769 F.3d 1232 (11<sup>th</sup> Cir. 2014)). The advent of the Internet and associated proliferation of digital media have made these fair use issues even more complicated.

concerning faculty-student, student-institution, and faculty-institution disputes should come as no surprise (Rooksby 2016b). As mentioned, technology transfer research often overlooks the role of the judiciary by ignoring, for example, the role of case law on technology transfer (Hayter and Rooksby 2016). We contend that the legal perspective is similarly important in investigations of copyrights within the context of universities.

Existing legal scholarship involving university copyrights focuses on high-profile, *sui generis* lawsuits, most of which concern fair use of copyrighted materials outside of the university.<sup>8</sup> However, scholars have yet to examine the impact of copyright related legislation (or case law) on university technology transfer. For example, following scholarly approaches to the Bayh-Dole Act, to what extent did the Copyright Act of 1976 and its revision in 1998 impact copyright ownership, use, enforcement, and related policies in higher education? Similar to scholarly discussion about the effect of the America Invents Act of 2011 (which dramatically changed U.S. patent law) on university technology transfer (MacWright 2017), how have changes in the copyright laws impacted copyright practices in higher education?

While Rooksby (2016b) examines patent litigation involving universities over the past 50 years, to what extent have universities been involved in copyright litigation, and to what extent has this litigation involved university personnel (i.e., faculty, students) or individuals or organizations outside the university? Similar to university action following *Stanford v. Roche*, how has this litigation affected university IP policy and management, if at all? Such data hold the

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<sup>8</sup> For example, recent litigation involving Google and HathiTrust addressed whether the large-scale scanning of books under copyright, for purposes of making the knowledge in those books text searchable, was covered by fair use, both by Google and a consortium of universities (which contributed books in its libraries to the project, and wished to offer limited views of the books to its users in response to search queries). The courts held that it did (*Authors Guild, Inc. v. HathiTrust*, 755 F.3d 87 (2d Cir. 2014); *Authors Guild, Inc. v. Google, Inc.*, 804 F.3d 202 (2d Cir. 2015)).

potential to open up new avenues of analysis concerning research collaboration and potential impediments to technology transfer.

## **5 Conclusion**

Despite the emergent interest of legal scholars, our understanding of copyrights and their use in knowledge exchange is embryonic. This paper has not only framed copyright from the perspective of research universities, it has also identified several promising directions for future research. These suggested approaches will broaden our knowledge of copyright, including how and why it is used by and within universities, its relationship to institutional and federal research prerogatives or mandates, and the role of legal perspectives on copyrights, thereby contributing to the technology transfer literature.

Further, investigations of copyrights will help expand conceptualizations of technology transfer beyond the patent-centric, linear model of technology transfer (Bradley et al. 2013). For example, scholars might consider the role of librarians in copyright policy, the role of copyright in software (de Laat 2005) and genomics databases (Cook-Degan 2007), and reasons why and how university spinoff companies employ copyright, similar to other types of knowledge-based firms (Siegel and Wessner 2012). Such investigations would likely provide insights into the appropriateness of copyright protection as a potential indicator of scientific and perhaps technological activity otherwise ignored in the literature.

Finally, the suggested research agenda likely has significant implications for management and policy, ones we hope will lead to better informed decisions at state, federal, and university levels relating to balancing IP protection and the dissemination and application of new university knowledge. Certainly this larger policy topic has received enormous interest as of late, though

rarely is copyright a central, let alone minor, component of these discussions.<sup>9</sup> Thus, a robust copyright research agenda would better position administrators, faculty, students, and policymakers to understand and coordinate disparate internal IP efforts, permit institutions to eliminate duplicative or irrelevant copyright policies and practices, and allow university leaders to articulate a vision of copyright that is consistent with the university’s knowledge dissemination mandates. Future knowledge-based contributions from universities likely depend on it.

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<sup>9</sup> See, for example, discussions concerning universities and proposed amendments to patent law aimed at curbing so-called “patent trolls” (Valdivia 2015).

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**Table 1: Example of information included in online copyright registration**

<b>Type of Work</b>	Text
<b>Registration Number / Date</b>	TX0001891146 / 1986-08-18
<b>Title</b>	Reflections on medicine, biotechnology, and the law / Zelman Cowan
<b>Imprint</b>	Univ. of Nebraska, College of Law; distributed by the Univ. of Nebraska Press, c1985
<b>Description</b>	60 p.
<b>Copyright Claimant</b>	University of Nebraska
<b>Date of Creation</b>	1985
<b>Date of Publication</b>	1986-05-23
<b>Date in Notice</b>	1985