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3D PRINTING – RISKS AND TRAPS TO WATCH OUT FOR IN THIS NEW INDUSTRY

Robert Bertin and Andrew Gray

May 2, 2018

Introduction

- 3D Printing Primer
- Public Safety/Constitutional Rights
- Commercial Litigation and Product Liability
- Relevant Types of Intellectual Property Protection
- Intellectual Property Considerations
- Key Intellectual Property Issues
- Recent IP Litigation Involving 3D Printing
- Conclusions

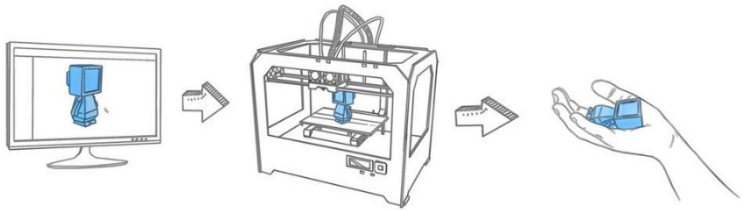
3D PRINTING PRIMER

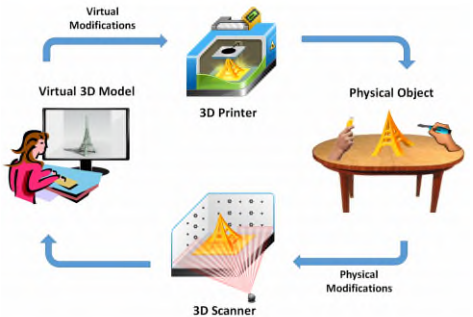
What Is 3D Printing?

3D Printing

An **additive manufacturing process** that creates a 3D physical object from a digital design by adding material layer by layer

New Object | **Existing Object**





Source: http://doodlesplash.co.uk/3d-printing/what-is-3d-printing--news
http://ammarhattab.com/

Examples of 3D Printing Technology

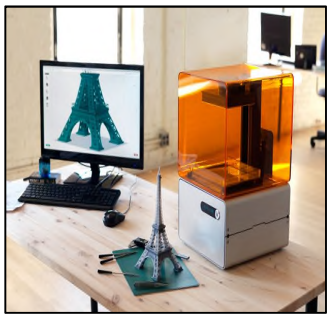
- **Stereolithography**
  - uses a laser to cure resin into plastic
- **Fused deposition modelling**
  - extrudes material through a nozzle
- **Selective laser sintering**
  - uses a laser to bind powder together
- **Binder jetting**
  - uses a liquid to bind powder together
  - may also use liquid to build objects without powder

Source: http://doodlesplash.co.uk/3d-printing/what-is-3d-printing--news
http://ammarhattab.com/

History and Advances

- Early 3D printers were large, expensive, and limited in use
- Technological advances have decreased printer size and cost and led to broader use
  - Q3D's OneUp 3D Printer costs under $200
  - 3D printers can now be used to "print" living cells to replicate biological organs
- Compare:

1992 – 3D Systems Stereolithographic printer



2012 Form Labs Funded with $3M on Kickstarter

2015 – Q3D OneUp 3D Printer

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Source: http://doodlesplash.co.uk/3d-printing/what-is-3d-printing--news
http://ammarhattab.com/

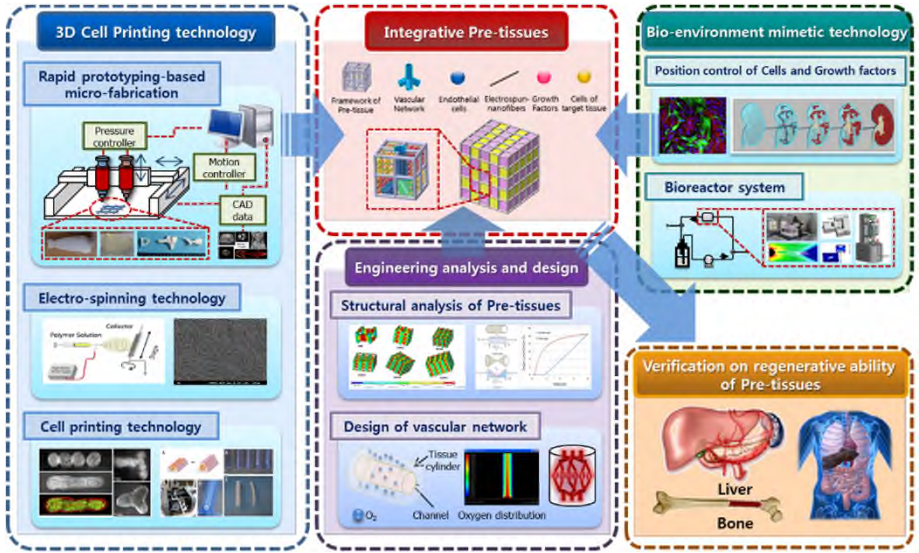
3D Printing Using Bio-materials

Bio-materials

Bio-materials are highly specialized biocompatible materials, called "bio-inks," that can include new polymers and even living cells.

Printer

The machines used for such printing are also highly specialized to handle the bio-inks safely, and to manufacture implants and tissue, and eventually, organs.



Source: https://3dprintingindustry.com/news/postechs-intelligent-manufacturing-systems-lab-leading-3d-biofabrication-charge-30178/

Examples of 3D Printing Using Bio-materials

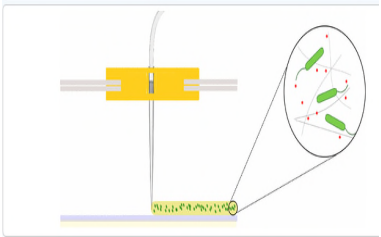
1

Bone Printer

Wake Forest's 3D printer in action at Wake Forest Institute for Regenerative Medicine and printed **jawbone and ear cartilage**

2

Bacterial Printer

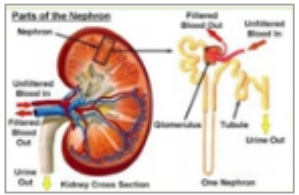


A straightforward way for 3D bacterial printing

by Benjamin A.E. Lehner, Dominik T. Schmieden, and Anne S. Mayer

3

Tissue/Organ Printer



1. Modeling the kidney proximal tubule and use 3D printing to **print kidney tissues**

2. 3D **printed skin grafts** to heal burns

Source: https://qz.com/616185/this-3d-printer-creates-human-muscles-and-tissues-that-could-actually-replace-real-ones/
http://3dprinthq.com/bioprinting-creating-human-organs-using-3d-printing/
https://www.psfk.com/2014/10/skin-graft-technology-3d-printing.html
http://pubs.acs.org/doi/abs/10.1021/acssynbio.6b00395

What Can 3D-Printing Do?

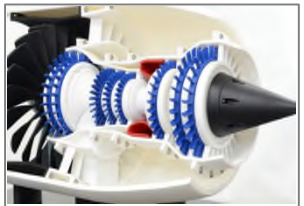
Construction

Life Science

Food

Transportation

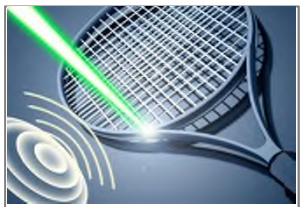
Firearms



Aerospace

Electronics

Apparel



Sports

Jewelry

Education

PUBLIC SAFETY/ CONSTITUTIONAL RIGHTS

Public Safety/Constitutional Rights

- Federal Undetectable Firearms Act (1988)
  - Passed over concerns of Glock 17 (polymer grip and frame).
  - Requires non-metal guns to contain a metal insert.
  - Undetectable Firearms Modernization Act (2015) – Little traction so far.

- In 2015, the State Department found that CAD files for 3D-printed guns are "defense articles" under ITAR and banned the distribution/hosting of such files.
  - Restrict access by foreign maleficent groups.
  - Distribution to U.S. citizens is not prohibited (no "exportation").

- Defense Distributed has challenged this State Department action.

Public Safety/Constitutional Rights

- State and Local Regulations

  - In 2013 Philadelphia outlawed 3D-printed guns without a license. Philadelphia Code § 10-2002.

  - California Assembly Bill No. 857 (effective July 2018) requires stainless steel to be embedded in 3D guns and prior to manufacturing or assembling a firearm, a person must:
    - (1) apply to the Department of Justice for a unique serial number,
    - (2) engrave or permanently affix the serial number within 10 days of manufacturing or assembling the firearm,
    - (3) notify the DOJ that the serial number has been engraved or permanently affixed, and
    - (4) provide sufficient information to identify the firearm, the owner of the firearm, and the unique serial number that was engraved or permanently affixed.

COMMERCIAL LITIGATION AND PRODUCT LIABILITY ISSUES

Commercial Issues

- Choice of Law
  - CAD file hosted in one location/state, downloaded in another.
  - Handle with terms-of-use.
- Confidentiality/IP Ownership
  - CAD Designers and 3D Printing Service Providers
  - Agreements should include Confidentiality and IP Ownership provisions
- Indemnification
  - The Relevant Parties:
    - 3D Printer Manufacturers
    - 3D Printing Service Providers
    - CAD Designers
    - 3D File Hosting Sites
    - Retailers
  - The Relevant Rights:
    - Infringement
    - Products Liability

Product Liability

- Product Liability law developed in response to mass-produced products and impersonal supply chains.
- Since traditional product liability is keyed to the manufacturing function, it is ill-suited to address products manufactured by nontraditional sources, such as 3D printing service providers, public libraries, and the like.
- Strict Liability is based on the defendant being a manufacturer or seller of a product.
  - Little/No Change for traditional manufacturers using 3D printing technologies as a new production technique.
  - Does it apply to 3D Printing Service Providers? People using 3D printed goods in connection with providing services? End-users 3D printing their own products?
  - How does traditional strict liability apply to end-users injured by a product manufactured by the user's own 3D printer?

Product Liability: What is the Product?

- How does product liability law address CAD files?
  - Electronic Data is not a "product" under the Restatement (Third) of Torts.
    - But software is a "product."
    - *ClearCorrect* suggests that digital files used in printing are not "products."
- The Creator of the CAD file
  - Can we identify the creator of the CAD file? Does he have any assets?
  - Does jurisdiction exist over the CAD file creator?
- What if the user modifies the CAD file?

Product Liability: Manufacturing, Design, and Warnings Defects

- In order to recover under strict liability doctrines, a plaintiff must prove that the product was defective in either its design, manufacturer, or warnings at the time of its sale/distribution.
- "Defects"? How do you establish causation?
  - The design in the CAD file was defectively created.
    - Bad design in the first place.
    - Bad scan of a 3D object used to create the digital design.
  - The CAD file became corrupted after it was created.
  - The defect was caused by some problem with the 3D printer.
    - User error?
    - Defect in 3D printer itself.
  - The defect was caused by some problem with the bulk material used by the 3D printer.
- Warnings? Who should provide them?
  - CAD file creator?
  - 3D Printer Manufacturer?
  - Bulk Material Manufacturer?
  - 3D Printing Service Provider? Must the 3D Printing Service Provider communicate warnings from others?

IP IMPLICATIONS FOR 3D PRINTING

Is 3D Printing a Deadly Threat to IP Rights?

3D printing: Decentralization of manufacturing

More infringers

Increased overall number of manufacturers (infringers)

Hard to Stop

Difficult to identify infringers and stop all sources of infringing goods: homemade and sold online

Scalable Infringement

Even relatively small number of infringing products can amount to sizeable loss of business due to the total number of infringers

Potential IP Rights

	 Blueprint (Design File)	 3D Printer	 Ink & Materials	 Printed Products
Utility Patent		Yes	Yes	Yes
Design Patent		Yes		Yes
Trademark /Trade Dress	Yes	Yes	Yes	Yes
Copyright	Yes	Yes	Yes (Package)	Yes
Digital Rights Management	Yes			
Trade Secret	Yes	Yes	Yes	Yes

Industry Disruption

- Life Sciences – tissue, pharmaceuticals, medical devices, joint implants, scaffold like implants, dental prosthesis
- Food – customized confectioners, burger, pizza, chocolate
- Apparel – custom fit clothing lines, shoes, sunglasses
- Transportation – entire automobiles
- Firearms – complete handguns and rifle assemble
- Aerospace – airplane engine components, RC Kits, entire planes in conception state
- Construction – hand tools and construction components
- Electronics - components
- Prototyping in the design of any product – architects, product designers
- Sporting goods – archery targets, golfing equipment
- Jewelry – necklace charms

FORMS OF INTELLECTUAL PROPERTY PROTECTION AND IP CONSIDERATIONS

Patents

- US Patents provide a right to exclude others from making, using, selling, offering for sale, or importing protected inventions
- Generally expensive and time-consuming to obtain
- Types of patent infringement:
  - Direct: liability for one who "makes, uses, offers to sell, or sells any patented invention, within the United States or imports into the United States any patented invention"
  - Induced: liability for one who "actively induces infringement of a patent"
  - Contributory: liability for one who "offers to sell or sells within the United States or imports into the United States a component of a patented machine, manufacture, combination or composition, or a material or apparatus for use in practicing a patented process, constituting a material part of the invention."

Copyrights

- "Copyright protection subsists, in accordance with this title, in original works of authorship fixed in any tangible medium of expression, now known or later developed, from which they can be perceived, reproduced, or otherwise communicated, either directly or with the aid of a machine or device."
- Copyrights do NOT cover useful works
- "Bundle" of Exclusive Rights of Copyright Owner*
  - Reproduction (Copies)
  - Create Derivative Works
  - Distribution
  - Publicly Display or Performance

* Not always the "creator" of the copyrighted work

- Inexpensive and easy to obtain
- Copyrights cover software, literary works, pictorial and sculptural works

Trademarks and Trade Dress

- A **trademark** is a word, phrase, design, sound, color, shape, scent, etc., or combination (not all countries recognize all these forms), which is used in trade with goods to indicate the source of the goods and to distinguish them from the goods of others.
- A **trade dress** is similar to a trademark except that it protects a product's physical appearance, including its size, shape, color, design, and texture

Trade Secrets

- Uniform Trade Secrets Act (UTSA)
- Includes an enormous amount of INFORMATION
- Under UTSA, "Trade secret" means information, including a formula, pattern, compilation, program device, method, technique, or process, that:
  - derives independent economic value, actual or potential, from not being generally know to, and not being readily ascertainable by proper means by, other persons who can obtain economic value from its disclosure or use, and
  - is the subject of efforts that are reasonable under the circumstances to maintain its secrecy
- Trade secrets can potentially be used to protect 3D software models, e.g., CAD files, of a product, manufacturing techniques, formulations of feed stocks, etc.

3D Printing and Intellectual Property

- Easy access to 3D printing technology gives almost anyone the ability to, whenever they want, create a variety of objects that may or may not be protected by intellectual property
  - E.g., replacement parts, tools, toys, appliances, organic material
- The disruptive nature of 3D printing technology has many companies looking for better ways to protect their intellectual property from people/companies that can now easily and cost-effectively replicate their products
- Many 3D printing patents are directed to software, databases, systems, and materials that operate within 3D printer systems. The U.S. Supreme Court's decision in *Alice Corp. v. CLS Bank International* (134 S.Ct. 2347 (2014) may impact the validity of these patents.

Enforcement Considerations

- Who do you sue?
  - Person/company that creates the 3D printed work?
  - Person/company that provides a CAD file of 3D printed work?
- What is the theory of infringement? Direct, induced or contributory?
- IP litigation expensive and time consuming
- Consumers using printers non-commercially are not a great target

Other Considerations

- Consider making it difficult to infringe / making it difficult to scan or obtain a useable 3D product
  - Encrypt 3D software models, e.g., CAD files, of a product
  - Design products such that any attempt to disassemble would render a product and/or its parts useless
  - Create incompatibility with 3D printed products
  - Have product purchaser agree not to re-engineer or use 3D printed parts
- Consider making it easy to 3D print a product and/or its parts
  - For example, sell a product along with access to and license to use 3D software models of replacement parts

KEY INTELLECTUAL PROPERTY ISSUES

Key Intellectual Property Issues

- Copyright
  - Direct Liability
  - Secondary Liability
    - Contributory Infringement
    - Vicarious Liability
- Trademarks, Trade Dress, and Passing Off
  - Direct Liability
  - Contributory Infringement
- Utility and Design Patent
  - Direct Liability
  - Secondary Liability
    - Inducement – 35 USC §271(b)
    - Contributory Infringement – 35 USC §271(c)

Copyright

- Copyright protects designs for useful articles having physical or conceptual separability of expression from function, as well as mechanical drawings, blueprints and other drawings used for construction of objects.

- A 3D object is copyrightable.
  - A 3D copy of a copyrighted work can constitute an infringement thereof.
  - Likewise, a 3D CAD file of a copyrighted object can infringe the copyright.
    - A CAD file is essentially the same as a blueprint or mechanical drawing, and can itself qualify as a copyrightable work.
    - Merely scanning a copyrighted work will not afford copyright to the person scanning it or to the CAD file produced from such scanning.

Copyright: Direct Liability

- If a 3D object is copyrighted and is then 3D printed, this *reproduction* can constitute infringement.
- If a digital file is copyrighted and is copied, or if it is uploaded to a site for 3D printing, this *copying/uploading* can constitute infringement.
- *Downloading* a copyrighted digital file creates a copy on a hard drive and can constitute infringement.
- *Distribution* of a copyrighted 3D object or digital file can constitute infringement.

- *Fair Use* is the principal defense.

Copyright: Secondary Liability

- **Contributory Infringement**
  - A defendant is a contributory copyright infringer if it has knowledge of a third party's infringing activity, and "induces, causes or materially contributes to the infringing conduct."
  - 3D Printer Manufacturer Liability:
    - *Betamax:* No infringement if there are "substantial non-infringing uses."
    - 3D Printers have Substantial Non-Infringing Uses.
    - Thus, no manufacturer liability for contributory copyright infringement absent additional conduct.
  - 3D Design Hosting Website Liability:
    - DMCA – Provides a safe-harbor for online service providers so long as
      - No actual knowledge of infringement.
      - No knowledge of facts/circumstances that would make infringement apparent.
      - No direct financial benefit in relation to infringement.
      - Once notified of infringement, must remove infringing material.
  - 3D Printing Service Provider Liability???

Copyright: Secondary Liability

- **Vicarious Liability**
  - The defendant must have:
    - the right and ability to supervise the infringing conduct, and
    - a direct financial interest in the infringing activity.
  - No courts have addressed the boundaries of vicarious liability in the specific context of 3D printing.
  - Does this apply to 3D Hosting Websites???

Trademarks, Trade Dress, and Passing Off

- Trademark and trade dress issues arise from 3D printing objects containing embedded marks or representing 3D trademarks (such as the shape of the Coca-Cola bottle) or other protected designs.
- 3D objects may represent protectable trade dress.
  - Secondary Meaning.
  - No coverage for features dictated by function.
    - Burden of establishing non-functionality of unregistered trade dress is on the entity claiming protection.
    - "Essential" features of a product that would put competitors at a "significant non-reputation[al]-related disadvantage" if they were not allowed to incorporate it, or would affect the cost or quality of the device, is deemed functional and excluded from protection.

Trademarks, Trade Dress, and Passing Off

- Direct Liability
  - Those who offer, sell, publicly display, or otherwise use the 3D object containing another's trademark/trade dress in commerce.
  - Use in commerce.
    - Is 3D at-home printing for personal use an actionable "use in commerce"?
- Contributory Infringement
  - Underlying direct infringement.
  - Manufacturer/distributor is contributorially liable for any harm done:
    - 1. Intentionally induces another to infringe a trademark, or
    - 2. Continues to supply its product to one whom it knows or has reason to know is engaging in trademark infringement.
- No statutory safeharbor like DMCA provides for trademark/trade dress law.

Patents

- Allows patentee to exclude others from making, using, or selling a patent invention/design.
- Direct Liability
  - Using 3D printers to make patent-infringing products.
    - This intermediaries who print 3D filed into patented objects for others face direct infringement liability.
  - Neither a blueprint, nor software instructions for creating a 3D printed article, constitutes a component of a patented object.
    - Mere distributors of 3D files are probably not making, using, or selling patented products.
  - Repair and Reconstruction:
    - Manufacturing unpatented replacement parts for a patented device is unlikely to infringe.
    - Reconstructing a patented device in its entirety from its constituent parts, however, is infringement.

Secondary Patent Liability: Inducement

- Inducement – 35 USC §271(b)
  - A distributor may be liable for inducement of patent infringement if it is willfully blind to the infringement:
    - (1) the defendant must subjectively believe that there is a high probability that a fact [of infringement] exists and
    - (2) the defendant must take deliberate actions to avoid learning of that fact.
  - Good faith belief of non-infringement is a defense.
  - Some have argued that a distributor of CAD files with actual knowledge or willful blindness that the file digitally represents a patented product or design should be found liable for inducement.

Secondary Patent Liability: Contributory Infringement

- Contributory Infringement – 35 USC §271(c)
  - Contributory patent infringement requires:
    - Direct infringement
    - Offering, selling or importing a "component" of a patented invention
    - "Knowing" the same to be especially made or especially adapted for use in an infringement:
      - "(c) Whoever offers to sell or sells within the United States or imports into the United States a component of a patented machine, manufacture, combination or composition, or a material or apparatus for use in practicing a patented process, constituting a material part of the invention, knowing the same to be especially made or especially adapted for use in an infringement of such patent, and not a staple article or commodity of commerce suitable for substantial noninfringing use, shall be liable as a contributory infringer."
    - "Component" excludes mere abstract digital instructions.
      - CAD files should not qualify as "components" of printed objects.
        - No contributory liability for 3D file hosts.

RECENT IP LITIGATION INVOLVING 3D PRINTING

Align Technology v. ClearCorrect (ITC 2015)

“Method and system for incrementally moving teeth”

Align Technology’s US 6,722,880

A method for making a predetermined series of dental incremental position adjustment appliances, said method comprising:

a. obtaining a digital data set representing an initial tooth arrangement;

b. obtaining a repositioned tooth arrangement based on the initial tooth arrangement;

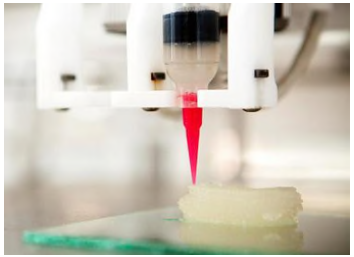
c. **obtaining a series of successive digital data sets representing a series of successive tooth arrangements; and**

d. fabricating a predetermined series of dental incremental position adjustment appliances based on the series of successive digital data sets, wherein said appliances comprise polymeric shells having cavities shaped to receive and resiliently reposition teeth, and said appliances correspond to the series of successive tooth arrangements progressing from the initial to the repositioned tooth arrangement.

Align Technology v. ClearCorrect (ITC 2015)

ClearCorrect in **Pakistan**

ClearCorrect in **U.S.**

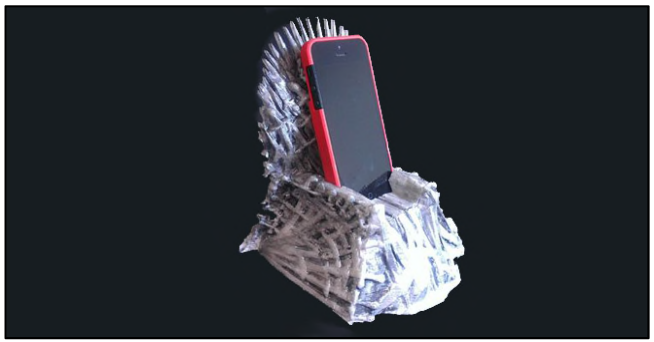


successive digital data sets

Recent IP Litigation

- Katy Perry threatened copyright litigation and sent a cease-and-desist letter to a man selling designs for 3D-printed figurines of the much-discussed "Left Shark" backup dancer from the Super Bowl half-time show

- HBO, which owns rights to the *Game of Thrones*, sent a cease-and-desist letter to a man selling designs for an Iron Throne iPhone docking station



Recent IP Litigation

- Paramount pictures sent a cease-and-desist letter to a man who uploaded the designs for a distinctive cube-shaped item from the Stephen Spielberg movie ‘Super 8’

Recent IP Litigation Matters Involving 3D Printing

- *Ritani, LLC v. Aghjayan*, 880 F.Supp. 2d 425 (S.D.N.Y. 2012): Court denied a motion to dismiss trade secret misappropriation claims that had been based in part on the theft of a 3D printable file.
- *3D Systems Inc. v. Formlab, Inc. et al.*, 1:13-cv-07973-RWS (S.D.N.Y. 2012): Dismissed pursuant to the terms of a Settlement and License Agreement where in 3D Systems Inc. granted Formlabs, Inc. a world wide non-exclusive, royalty bearing license.

Morgan Lewis Technology May-rathon 2018

Morgan Lewis is proud to present Technology May-rathon, a series of tailored webinars and in-person programs focused on current technology-related issues, trends, and legal developments.

This year is our 8th Annual Tech May-rathon and we are offering over 30 in-person and virtual events on topics of importance to our clients including privacy and cybersecurity, new developments in immigration, employment and tax law, fintech, telecom, disruptive technologies, issues in global tech and more.

A full listing and of our tech May-rathon programs can be found at https://www.morganlewis.com/topics/technology-may-rathon

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Biography

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Rob Bertin has nearly 20 years of experience litigating patent, trademark, trade secret and copyright cases throughout the United States, counseling clients on intellectual property (IP) and negotiating transactions involving IP. He has represented clients at the center of some of the largest patent portfolio sale and licensing events in the high tech industry, including the Nortel and Kodak transactions. Rob leverages a technical background to represent large and small companies primarily in high technology industries.

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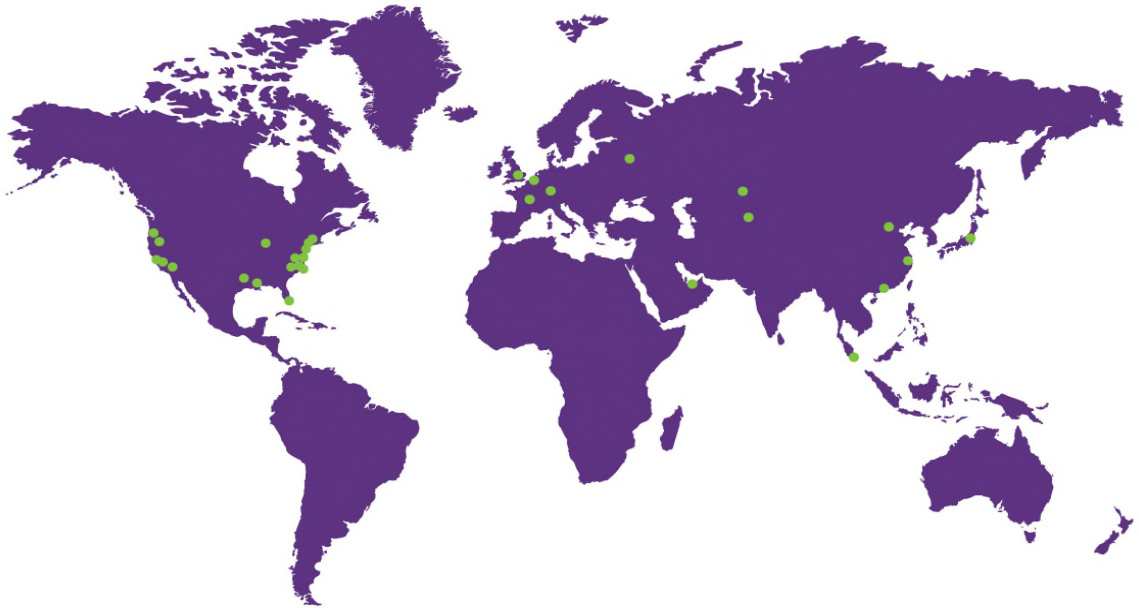
Serving as the leader of Morgan Lewis's semiconductor practice, Andrew J. Gray IV concentrates his practice on intellectual property (IP) litigation and prosecution and on strategic IP counseling. Andrew advises both established companies and startups on computer and Internet law issues, financing and transactional matters that involve technology firms, and the sale and licensing of technology. He represents clients in patent, trademark, copyright, and trade secret cases before state and federal trial and appellate courts throughout the United States, and before the US International Trade Commission.

Our Global Reach

Africa
Asia Pacific
Europe
Latin America
Middle East
North America

Our Locations

Almaty
Astana
Beijing*
Boston
Brussels
Century City
Chicago
Dallas
Dubai
Frankfurt
Hartford
Hong Kong*
Houston
London
Los Angeles
Miami
Moscow
New York
Orange County
Paris
Philadelphia
Pittsburgh
Princeton
San Francisco
Shanghai*
Silicon Valley
Singapore
Tokyo
Washington, DC
Wilmington



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THANK YOU