

Legal Technology & Informatics:

Course Reader

Think Outside The Bar

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General -- Definitions

This class is oriented toward a mix of law and computer science students. From a legal perspective, this class will explore how to analyse information flow through a legal issue and how to address the expectations of each party in terms of that information flow. From a technological perspective, this class will look at what can be built and implemented to facilitate that information flow. Students are encouraged to help edit the Wikipedia article on Legal Informatics.

In this class, we define “(legal) informatics” as the analysis of the information flow for a given type of (legal) function. “(Legal) technology”, on the other hand, is the mechanism that facilitates that (legal) flow. Thus, there can be many technical means to accomplish a given informatics problem, and, conversely, any given technology may be applicable to several types of problems.

- Informatics
Wikipedia: <http://en.wikipedia.org/wiki/Informatics>
- Legal Informatics
Wikipedia: http://en.wikipedia.org/wiki/Legal_informatics
- Technology
 1. the science or study of the practical or industrial arts, applied sciences, etc.
 2. applied science.
 3. a method, process, etc. for handling a specific technical problem.
 4. the system by which a society provides its members with those things needed or desired.Wikipedia: <http://en.wikipedia.org/wiki/Technology>
- Legal Technology
- Robert C. Richards, Jr. - Legal Informatics Blog
<http://legalinformatics.wordpress.com/>
- ABA Journal - Legal Technology
<http://www.abajournal.com/topic/legal+technology>
- Richard Susskind - The End of Lawyers?
<http://www.amazon.com/End-Lawyers-Rethinking-nature-services/dp/0199593612/>

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Legal Landscape: Transformations

- State of the Legal Industry Survey (2009, LexisNexis):
http://www.lexisnexis.com/document/State_of_the_Legal_Industry_Survey_Findings.pdf
- Legal Transformation 2020:
<http://www.legaltransformation.com/>
- Legal Transformation 2020 (Summary):
<https://www.legaltransformation.com/studysummary.asp>

Problem: Science Fiction and The Law

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Scope: Voting and Electronic Voting Machines

Is voting relevant to “legal technology and informatics”? Voting was listed as one of the top-10 legal technology needs by one GC (see the [Corporate Section](#) below). Which technology is worth including -- is there a technology that won't have any impact on the law?

- Google Scholar search on “electronic voting machines”
<http://scholar.google.com/scholar?q=electronic+voting+machines>
- ProCon.org - Voting Machines
<http://votingmachines.procon.org/>
- Wikipedia - Electronic voting
http://en.wikipedia.org/wiki/Electronic_voting

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Internet and The Cloud: Technological Delivery of Legal Services

- Leveraging Technology to Deliver Legal Services
jolt.law.harvard.edu/articles/pdf/v23/23HarvJLTech259.pdf
- Attorney Fees
<http://attorneyfee.com/>
<http://www.tymetrix.com/products/legal-analytics/> (law firms and corporate legal departments fee benchmark-on-demand)
- Legal Documents
<http://www.legalzoom.com/>
<http://whichdraft.com/> (contracts)
- Attorney Access
<http://www.rocketlawyer.com/>
<http://www.superlawyers.com>
<http://boards.answers.findlaw.com/n/forumIndex.aspx?webtag=fl-answersidx>
- Virtual Practice
<http://virtuallawpractice.org/>
<http://www.digital-lawyer.com/>
<http://www.directlaw.com/>
<http://www.goclio.com/>
<http://www.totalattorneys.com/law-firm-resources/law-practice-management/>

Updates: Dockets; Patent and Trademark Applications; Statutes and Regulations (see [Corporate Section](#) on push technologies).

- PACER (Public Access to Court Electronic Records)
<http://lexmachina.com>

Ethics

- Julie C. Fischer - Policing the Self-Help Legal Market: Consumer Protection or

Protection of the Legal Cartel?

<http://heinonline.org/HOL/LandingPage?collection=journals&handle=hein.journals/indlr34&div=16>

- Online Advertising: Directory vs. Paid Client Acquisition
 - <http://virtuallawpractice.org/2012/03/update-on-the-ethics-of-performance-based-marketing/>
 - <https://www.nationalbankruptcyforum.com/bankruptcy-practice-management/illinois-made-the-right-call-in-dismissing-complaint-against-kevin-chern-total-attorneys/>
 - <http://www.ipubviewer.com/publication/?i=102306>
- Stephanie Kimbro - Regulatory Barriers to the Growth of Multijurisdictional Virtual Law Firms and Potential First Steps to their Removal
http://www.ncjolt.org/sites/default/files/3Art_Kimbro_165_226.pdf
- Catherine J. Lanctot - Unlicensed Practice of Law (UPL) vs. First Amendment Rights :
http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1874986
 - Related work by Catherine J. Lanctot:
http://works.bepress.com/catherine_lanctot/doctype.html

Problem: Digital Courtrooms: Nationally Distributed Jury Pools

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Corporate Issues

- The Cisco Way: This Internet Giant's Outside Counsel Must Stay Tech-Savvy to Survive
http://www.abajournal.com/magazine/article/the_cisco_way/
- Legal OnRamp
http://en.wikipedia.org/wiki/Legal_OnRamp

- Minnesota State Archives Legal Risk Analysis
<http://www.mnhs.org/preserve/records/tis/Legalriskoptions.html>
www.mnhs.org/preserve/records/tis/docs_pdfs/Legalrisk.pdf

(thanks to [Kelly Ray, esq.](#), GC at LRCI, for detailed assistance with the following)

1. standards

- GRC-XML (government regulation encoding for corporate compliance and risk assessment)
- XBRL (<http://www.xbrl.org/>)
- UTBMS

2. content-embedded service-oriented systems

- risk/compliance automation, end-to-end system
- GRC (<http://accelus.thomsonreuters.com/>)
- legal risk analysis (behind the curve related to other types of risk analysis) (largely insurance driven): Rand and Praedicat
 - needed, but lacking so far (compared to, say, geopolitical and catastrophic risk analysis)
 - <http://www.rand.org/news/press/2012/03/14.html>
 - <http://www.praedicat.com/>
- laws and regs are represented as business rules and reference links
- enables automated flagging of policies and procedures when underlying statutes or regulations change

3. legal risk analytics

- the model of, and ways of representing, legal risks (as opposed to the tools that do that assessment under #2 above)
- largely ignored by state/local governments
- some (commonly partisan) groups analyze good business environments (e.g. tort reform)
- there is no model that lets us model and analyze legal risk
- relationship to "computational law"?

4. legal process management (workflow)

- litigation project management
- criminal, court, cases, prison, parole, etc.

5. litigation support and "evidence-management"

- e-discovery (<http://law.lexisnexis.com/concordance>)
- realtime transcript reporting
- strategy and evidence mapping
- timeline reconstruction (<http://www.casesoft.com/casemap/casemap.asp>)
- evidence presentation (<http://www.indatacorp.com/>)

6. push technologies

- a. statute, regulation updates
 - i. OFAC (list of bad people: terrorists, money laundrettes)
 - ii. fed/state govt corporate blacklist (i.e. lacking in some requirement)
 - iii. professional ethics violations
 - b. standards updates
 - c. administrative agency user-generated content
 - i. PTO (e.g. patentsafari.com)
 - d. docket updates: <http://www.llrx.com/features/docketsupdate.htm> (derived from old "case stream" docket watching system)
 - e. M&A due diligence (ongoing target updates)
 - f. competitive analysis for out-of-compliance notices
- 7. mobile technologies**
- a. just-in-time, where-you-are
 - b. Fenwick's notices to opposing counsel to drive settlements
 - c. legal publishers
 - i. just-in-time in-court legal research
 - ii. interactive decision support (e.g. conference, board meeting, etc.)
 - d. contract templates (e.g. at point-of-sale)
 - e. audit, compliance (e.g. report completion, "can I buy vendor a drink?")
 - f. helpline/hotline question answering in the field
- 8. electronic survey and voting**
- a. political arena (e.g. ballot measures)
 - i. citizen issue awareness
 - ii. voting technology
 - b. corporate governance
 - i. shareholder voting
 - ii. board voting
 - c. audits
 - i. internal audits: control self-assessment
 - ii. ethics: employee observations, compliance, training evaluation, etc.
- 9. content acquisition and navigation technologies**
- a. distributed content acquisition and aggregation (<http://www.connotate.com/>)
 - b. knowledge management
 - c. intelligent browsing
 - d. search and general information intermediation

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Search: “Information Intermediation”

General

- Vector space model
Wikipedia - http://en.wikipedia.org/wiki/Vector_space_model
- Example - Google Scholar Search function
http://scholar.google.com/advanced_scholar_search

Multifaceted Search

- Online date matching: OkCupid
<http://www.okcupid.com/help/match-percentages>

Caselaw Search

Different examples of caselaw search engines:

- WestLaw Next
- <http://store.westlaw.com/westlawnext/>
- Ravel Law
<http://ravellaw.com>
- Amicus Labs
<http://amicuslabs.com/careers>

E-discovery

- The Legal Track at the Text Retrieval Conference
<http://trec-legal.umiacs.umd.edu/>
- The Electoral Discovery Reference Model
<http://www.edrm.net/>
- Technology-Assisted Review in E-Discovery Can Be More Effect and More Efficient Than Exhaustive Manual Review - Maura Grossman, Gordon Cormack
<http://jolt.richmond.edu/v17i3/article11.pdf>

- Where the Money Goes: Understanding Litigant Expenditures for Producing Electronic Discovery
http://www.rand.org/content/dam/rand/pubs/monographs/2012/RAND_MG1208.pdf
- Ralph Losey - E-discovery Blog:
<http://e-discoveryteam.com/>
- From E-Discovery Text (Scheidlin, Capra, Sedona):
Effect of Electronic Information on Discovery Practice
- The Legal and Economic Implications of E-Discovery: Options for Future Research:
http://www.rand.org/pubs/occasional_papers/OP183.html
- Federal Rule of Evidence 502: Has it Lived Up to its Potential? - Paul Grimm, Lisa Yurwit Bergstrom, Matthew Krauter
<http://jolt.richmond.edu/v17i3/article8.pdf>
- Univeristy of Richmond School of Law, Journal of Law and Technology
<http://jolt.richmond.edu/v13i3/index.asp>
- Information Inflation: Can The Legal System Adapt?
<http://jolt.richmond.edu/v13i3/article10.pdf>

Sampling:

- Sean Doherty - Judge Peck Addresses Predictive Coding in Federal Court Order:
http://www.law.com/jsp/lawtechnologynews/PubArticleLTN.jsp?id=1202542221714&Judge_Peck_Orders_Predictive_Coding_in_Federal_Case
- Jason Krause - Still Searching: Computers Change the Role of Lawyers in E-Discovery:
http://www.abajournal.com/magazine/article/still_searching_computers_change_the_role_of_lawyers_in_e-discovery/

M&A: Due Diligence

Patent Search

Search Challenges

- Annotating Patents with Medline MeSH Codes via Citation Mapping (Thomas D. Griffin, Stephen K. Boyer and Isaac G. Council) <http://www.ncbi.nlm.nih.gov/pubmed/20865561>

- Finding relevance to a topic within patents is often made difficult by poor categorization, badly written descriptions, and even intentional obfuscation.
- Multidisciplinary Information Retrieval:
 - Multidisciplinary Information Retrieval (on intentional obfuscation):
 - <http://www.amazon.com/Multidisciplinary-Information-Retrieval-Proceedings-Applications/dp/3642213529/>
 - Multidisciplinary Information Retrieval (on intentional obfuscation):
 - <http://books.google.com/books?id=jYZTfao-WcUC&pg=PA4&lpg=PA4&dq=%22intentional+obfuscation%22+patents&source=bl&ots=u6hdS4Tgt3&sig=dsV4hiXF3gadQGTzS8PRTHTtBys&hl=en&sa=X&ei=ggNAT-DdDrGXiQebmdWhAw&ved=0CCsQ6AEwAQ#v=onepage&q=%22intentional%20obfuscation%22%20patents&f=false>

Lex Machina

- Lex Machina: IP litigation and analytics
 - <http://lexmachina.com/>

Non-lawyer Legal Search

- Nolo
 - http://www.nolo.com/?utm_source=google&utm_medium=cpc&utm_content=bankruptcy&utm_campaign=noloofficial&gclid=CMr9xOXpkrICFYhxQgodS3gAZw
- Legal Zoom
 - http://www.legalzoom.com/?WT.srch=1&kid=6505423f-5ef9-eea8-eba2-000008821e88&se=google&q=legal%20zoom&refcd=GOlegal_zoom_s&tsacr=GO20094552247&cm_mc_o=7BBTkWCjCWwc%20C%20PyzEp%20C%20mbfwkbELICjCPyzEpbETjH0zgfCjCkwTzk%20OBBF&gclid=CJHF0P3pkrICFWWCQgodyTAATQ
- Google
 - <https://www.google.com/>

Problem: Digital Courtrooms: General Requirements

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Data Privacy & Protection

- “The technology that’s affecting privacy the most on the Internet is improved search.” -- David Holtzman, *Privacy Lost*, p. 60.
<http://www.amazon.com/Privacy-Lost-Technology-Endangering-Your/dp/0787985112>
- Orbitz Controversy: Tip of Big Data Iceberg
<http://www.informationweek.com/news/software/bi/240002737>
 - Higher priced items shown to Mac users

Legal Issues

- Lothar Determann: Determann's Field Guide to International Data Privacy Law Compliance
<http://www.amazon.com/Determanns-Field-International-Privacy-Compliance/dp/0857932330>

Social Issues

- Lori Andrews - I Know Who You Are and I Saw What You Did: Social Networks and the Death of Privacy
<http://www.amazon.com/Know-Who-You-Are-What/dp/1451650515>
- How Target Figured Out A Teen Girl Was Pregnant Before Her Father Did:
<http://www.forbes.com/sites/kashmirhill/2012/02/16/how-target-figured-out-a-teen-girl-was-pregnant-before-her-father-did/>
 - Targeted advertising from a user’s search led Target to mail ads for new mothers to a pregnant teenager
- Cloud-based Storage: “Why won’t Microsoft let you store porn in the cloud?”, Sean Ludwig <http://venturebeat.com/2012/08/19/cloud-restrictions-porn-xxx/>
“Boiling it down further, Dropbox and SugarSync seem to be the two best consumer options for storing content without worrying about Big Brother snooping on your account or disabling it for questionable content. Box is more ideal for business use, and Google’s policies still have more restrictions than we’d like.”

Technical Issues

- Privacy Lost: How Technology Is Endangering Your Privacy (David H. Holtzman):
<http://www.amazon.com/Privacy-Lost-Technology-Endangering-Your/dp/0787985112>

Cookies

- Information control. Prevention of information release to unauthorized third parties.
- What are the differences that we need to implement technologically?

P3P

- Platform for Privacy Preferences Project
<http://www.w3.org/P3P/>

Search Query Privacy: The Problem of Anonymization

- Ron Dolin - Search Query Privacy: The Problem of Anonymization
<http://hstlj.org/wp-content/uploads/2011/08/v2i2dolin.pdf>

Problem: Onward Transfers of Private Information

Problem: Predicting, Detecting, and/or Preventing Criminality

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Computational Law/Automated Reasoning

Legal Automation:

- The Profession: “Will Robots Steal Your Job? Software could kill lawyers. Why that’s

good for everyone else.”

http://www.slate.com/articles/technology/robot_invasion/2011/09/will_robots_steal_your_job_5.html

- ‘Ethical’ Killer Robots?
 - Losing Humanity: The Case against Killer Robots
<http://www.hrw.org/reports/2012/11/19/losing-humanity>
 - “Governing Lethal Behavior: Embedding Ethics in a Hybrid Deliberative/Reactive Robot Architecture”
<http://smartech.gatech.edu/handle/1853/22715>

Taxes

- Turbo Tax
Wikipedia: <http://en.wikipedia.org/wiki/TurboTax>
- ProSystem FX: tax and accounting software
http://www.cchgroup.com/webapp/wcs/stores/servlet/category_ProSystem-fx-Suite--Inc-ome-Tax-Accounting-Audit-Workflow-Software_10151_-1_10053_50005702

Enterprise Management Systems

Business Rules

Computable Contracts

- Kiiac tool for semi-automated contract formation
<http://www.contractstandards.com/document-automation>
- Harry Surden paper draft (?)
- Paper from UCI team looking at open source licenses?

Ontologies

- Library of Congress Classification (Law is under K)
<http://www.loc.gov/catdir/cpsolcc.html>

Problem: AI and The Law

Problem: Is Code Law? -- Regulating Moving Violations

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Standards

1. **[OASIS](#)**
 - a. [LEGALXML](#)
 - b. [LegalDocumentML](#)
 - c. [LegalRuleML](#)
2. **[LEDES](#)**
 - a. billing -- UCR analysis
3. **[NLRC](#)**
4. **[ILTSO](#)**
5. **Contract Standards:**
 - a. <http://www.contractstandards.com/>
 - b. <http://contracts.acc.com/acc/forms.aspx>
 - c. <http://tdlp.classcaster.net/2012/03/16/tdlp-class-6-kingsley-martin-contract-standardization/>
6. **API's ?**
7. **Certification**
 - a. process

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Learning from Biomedical Informatics

What are the similarities and differences between Biomedical Informatics and Legal Informatics, and why?

Automation

- Will Robots Steal Your [medical] Job?
http://www.slate.com/articles/technology/robot_invasion/2011/09/will_robots_steal_your_job_3.html

Where Is the Profession Practiced?

Clinical work – practitioners' offices, hospitals

For law – courts, legislators, agencies, police, prisons, law firms, entity legal departments

Empiricism

<http://www.lawschool.cornell.edu/research/cornell-law-review/Volume-96-Number-4.cfm>

- Jeffrey Rachlinski - Evidence-Based Law
www.lawschool.cornell.edu/research/cornell-law-review/upload/Rachlinski-final.pdf
 - Rachlinski is mainly interested in identifying the basic difference between law on the one hand and medicine and business on the other: why doctors and businessmen navigate their affairs according to empirical findings without relying on common wisdom or on unproven economic theories, while law (both via legislation and administration) is slow to admit empirical evidence in its decision-making process. Indeed, it is surprising that business and medical practitioners are more critical of scientific theories than are legal practitioners, judges, and legislators, whose field of activity is the critical assessment of facts, events, and behavior.
 - Cornell Law Review Volume 96 Number 4: Symposium on the Future of Legal Technology
www.lawschool.cornell.edu/research/cornell-law-review/upload/Wozner-final.pdf

Standards, Certification, and Accreditation

ISO: special category for health care industry.

- Applications in Information Technology
http://www.iso.org/iso/iso_catalogue/catalogue_ics/catalogue_ics_browse.htm?ICS1=35

[&ICS2=240](#)

- IT Applications in Healthcare Technology

http://www.iso.org/iso/products/standards/catalogue_ics_browse.htm?ICS1=35&ICS2=240&ICS3=80

Controlled vocabularies

Document formats

Information exchange

Economics

History

Medical – began in 50's and 60's in Europe; U.S. Began in the 70's.

Clients vs. Patients

Profession

Practice Guidelines

Standard of Care

Payment (insurance, hourly, cost-splitting, referrals, contingencies, bidding, commoditization)

Education

Methodology; clinic work; internships; residency and postdocs; JSD vs. Ph.D.

Research

Leading journals, peer review

Record-Keeping

Institutions

Technology

Formal Methods

Decision support

- Protege: The evolution of Protege: an environment for knowledge-based systems development
<http://dl.acm.org/citation.cfm?id=766321>

Analyses

Scientific method

Formal modeling

Composition

- Health Informatics (history)
http://en.wikipedia.org/wiki/Health_informatics
- UK Council of Health Informatics Professions
<http://www.ukchip.org/>
 - [T]he UK Council of Health Informatics Professions has suggested eight key constituencies within the domain - information management, knowledge management, portfolio/programme/project management, ICT, education and research, clinical informatics, health records (service and business-related), health informatics service management. These constituencies accommodate professionals in and for the NHS, in academia and commercial service and

solution providers.

Drivers

Medicare, VA, HHS,
electronic documents

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Computational Analysis, Prediction and Visualization

Litigation Risk Analysis

- Litigation Risk Analysis - Develope by Marc B. Victor
<http://www.litigationrisk.com/>
- IP Litigation Data and Analytics
<http://lexmachina.com/>

Legal Prediction

- Dan Katz: [Quantitative Legal Prediction](#) (draft via SSRN)

Damages Calculations

Data Visualization

- The Work of Edward Trust and Graphic Press
<http://www.edwardtufte.com/tufte/>

Anti-dilution Formula

U.S. Supreme Court Citation Graph, Over Time

- Computational Legal Studies”Visualizing Temporal Patterns in the United States Supreme Court’s Network of Citations
<http://computationallegalstudies.com/2010/05/04/visualizing-temporal-patterns-in-the-unit-ed-states-supreme-courts-network-of-citations/>
- Dan Katz: Quantitative Analysis for Lawyers
Course: http://www.law.msu.edu/academics/course_desc.php?cid=455

- Colin Starger - A Visual Guide to NFIB v. Sebelius: Competing Commerce Clause Opinion Lines 1789-2012;
http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2097161
- Colin Starger - Expanding Stare Decisis
http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2040881

Problem: Computational Analysis; Visualization

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Legal Education and Research

Legal Education in Disruption: The Headwinds and Tailwinds of Technology

Jon Garon

At a minimum, this means every law school should provide an up-to-date law practice management curriculum available to every student, one that teaches a lawyer how to meet all the duties of professional responsibility (including the newly proposed duty to stay current with technology and protect the digital information held on behalf of a client). The Best Practices study captures this competency as expecting a new lawyer to “[e]ffectively use current technologies and strategies to store, retrieve and analyze information and to undertake factual and legal research.” *Students who graduate from forward-thinking legal technology courses have the potential to leapfrog over more senior attorneys who are unwilling to keep up with these tools and the changing expectations of their clients.* [emphasis added, footnotes deleted]

E-learning

The College of Law E-learning: 5-year review

www.college-of-law.co.uk/WorkArea/DownloadAsset.aspx?id=8831

Computer Assisted Legal Research

Computer Programming and the Law: A New Research Agenda; 54 Villanova Law Review 117 (2009), [Paul Ohm](#)

http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1370411

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Access to Law, Justice

U.S.

Commentary on legislation, now used by some political parties for citizen feedback.

<http://www.democraticwhip.gov/content/whip-hoyer-announces-house-democrats-adopti-on-new-online-tool-hear-citizens-and-organization>

<https://www.popvox.com/>

- Federal Legislation and Related: <http://beta.congress.gov/>
- Legal Services Corporation: <http://www.lsc.gov/>
- Calbar's Center on Access to Justice:
<http://www.calbar.ca.gov/AboutUs/CenteronAccesstoJustice.aspx>
- Calbar's [LPMT](#), MCLE, ABA Model Rules of PR, law school accreditation
- ABA Adopts Ethics Policy on Lawyers' Use of Technology",
<http://www.law.com/jsp/lawtechnologynews/PubArticleLTN.jsp?id=1202566577730>

International

- Belgium: http://ec.europa.eu/civiljustice/legal_aid/legal_aid_bel_en.htm
- Belgium Constitution, Art. 23:
http://www.dekamer.be/kvvcr/pdf_sections/publications/constitution/grondwetEN.pdf
- UK Legal Aid Eligibility: http://www.legalservices.gov.uk/civil/civil_legal_aid_eligibility.asp
- Haiti law school and donated computers:
<http://www.kazanlaw.com/about/haiti.php>

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The Future of Legal Technology

What are the drivers of legal technology? What types of changes are inevitable, under what timeframe, and why? How might technology impact the legal profession over the next 5, 10, 50 years? What about the meaning of law and legal philosophy?

Legal Evolution

<http://www.jstor.org/discover/10.2307/2775207?uid=2129&uid=2&uid=70&uid=4&sid=21101203681797>

Related Courses and Faculty

http://www.kentlaw.edu/faculty/rstaudt/classes/justicetech_fall2011/assignments.htm

http://www.law.msu.edu/faculty_staff/profile.php?prof=780

http://lawweb.colorado.edu/courses/courseSection.jsp?id=LAWS8321&term=20101#section_00

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Future Issues and Problem Suggestions

AI and The Law:

Overview of AI and The Law

A history of AI and Law in 50 papers: 25 years of the international conference on AI and Law

<http://www.springerlink.com/content/0742682168q0871v/>

Limitations

What are the limitations, if any, of AI applied to the Law? In what timeframe? What might be the advantages and disadvantages of a fully-automated legal system? Who gets to change it? What are the implications regarding various legal and moral philosophies (e.g. source and use of natural law)? Are there always *material* “exigent circumstances”?

... I could not see how computers could at that stage, if ever, be programmed to display the creativity, craftsmanship, individuality, innovation, inspiration, intuition, and common-sense, that lawyers often bring to bear in advising clients and solving legal problems.

[Richard Susskind, p. 14, *The End of Lawyers?*, 2010]

Free Will: Legal, Moral, and Computational Responsibility

My robotic vacuum cleaner ate my carpet -- is it culpable? Watch Kubrick's 2001: A Space Odyssey. Is HAL guilty of murder? Watch 2010: The Year We Make Contact. Was HAL guilty? What are the functional requirements of a decision-making algorithm that could be found

culpable? Can a dog be culpable, and if so, of what? Why? What changes as we age that allows adults to be held to a higher moral standard than infants, incompetents, or the insane? Can machines exhibit negligence, intent, willful blindness? Is culpability possible from a single decision-making algorithm, or is there a meta-decision-making process that's involved (or can the entire nested call structure be viewed as a single algorithm)? Is it recursive by necessity, and, if so, what triggers a return? Is there possibly an algorithm for "free-choice", or is that an oxymoron? Is such a process a prerequisite for culpability? What are the circumstances under which a soldier is and is not guilty of murder for killing an enemy soldier? Can software ever make a claim to "self-defense"?

Why does the law differentiate between the responsibility assignable to minors compared to adults? Identify the legal (pragmatic), moral, and computational points at which an agent or robot should be responsible for its own actions, as opposed to the responsibility being assigned to its creator. If these points are different, explain why. What does this imply about the various justifications for punishment, punitive damages, and strict liability?

<http://stlr.stanford.edu/2012/02/a-neurological-foundation-for-freedom/>:

Part I begins with a discussion of legal free will, a concept that appears most controversially in criminal law but also pervades most areas of law. Underpinning the attribution of responsibility in criminal law is a presumption that humans are free to act and to refrain from acting ("legal free will"). But legal free will is in fact a misnomer since the freedom it describes is a vacuous one. Scholars claim that the law holds individuals responsible for their actions not because they are free, but because it is expedient to treat them *as if* they are free. This leaves the legal system open to persistent attacks on its legitimacy for failing to comport with ordinary intuitions about moral responsibility. In criminal law in particular, legal free will creates a problem because its proponents disclaim any need to grapple with questions about moral responsibility. Because the power of the state and the threat to liberty is at its highest in the control of conduct deemed criminal, the refusal to grapple with questions of theoretical free will leaves the criminal justice system open to a never-ending slew of attacks.

http://www.nytimes.com/2012/01/24/technology/googles-autonomous-vehicles-draw-skepticism-at-legal-symposium.html?_r=1:

"It won't truly be an autonomous vehicle," said Brad Templeton, a software designer and a consultant for the Google project, "until you instruct it to drive to work and it heads to the beach instead."

The implications of free will on tax law: "Luck, Wealth, and Implications for Policy", Richard Posner

<http://www.becker-posner-blog.com/2012/10/luck-wealth-and-implications-for-policy-posner.html>

In short, I do not believe in free will. I think that everything that a person does is caused by something. It is true, and is the basis of belief in free will, that often we are conscious of considering pros and cons in deciding on a course of action; “we” are deciding, rather than having the decision made by something outside “us.” But calculation and decisionmaking are different. Deciding may just mean calculating the balance of utility and disutility; the result of the balance determines the decision. No doubt when a cat pounces on a mouse, it has decided to do so; but the decision was compelled by circumstances—the feline diet, the presence of the mouse, etc. A complete description of the incident would not require positing free will.

<http://www.economist.com/node/21556234>

IN THE classic science-fiction film “2001”, the ship’s computer, HAL, faces a dilemma. His instructions require him both to fulfil the ship’s mission (investigating an artefact near Jupiter) and to keep the mission’s true purpose secret from the ship’s crew. To resolve the contradiction, he tries to kill the crew.

As robots become more autonomous, the notion of computer-controlled machines facing ethical decisions is moving out of the realm of science fiction and into the real world. Society needs to find ways to ensure that they are better equipped to make moral judgments than HAL was.

Futurama: Free Will Hunting

<http://www.amazon.com/Free-Will-Hunting-HD/dp/B008V6YI2G>

Star Trek’s **Data**: Empathy and The Law

Criminal sentencing guidelines include several factors, some of which are amenable to easy computation, some not so much. What can a computer do or not do, and why? How do we balance consistency with the plethora of possible exceptions and exigent circumstances? Would an algorithm be an improvement or detriment, and under which circumstances? Can there be fairness without empathy and compassion? Can empathy be the responsibility of the programmer, and fairness be the responsibility of the program?

What is the proper and/or pragmatic role of empathy in the law? How does it impact, say,

criminal sentencing, and what are the pros and cons of incorporating it? What about legal creation (e.g. legislation), selective enforcement (e.g. prosecutorial discretion), jury decisions (e.g. jury nullification), or equity (e.g. fairness)? If empathy is an important component of the law (e.g., [Ronald Dworkin](#) says [law is an attitude](#)), can it be encoded in machines; if so, what would the algorithm look like? Would a truly autonomous, empathetic machine or robotic judge or robocop care more about humans, or other machines, or both in *balance*? Would any sufficiently intelligent entity become species-centric?

http://en.memory-alpha.org/wiki/Emotion_chip

<http://opinionator.blogs.nytimes.com/2009/05/24/empathy-and-the-law/>

The law, Cohen concludes, should not be a self-referring construct of “pure geometry,” but a “social process” that deals with “human activity, with cause and effect, with the past and the future.” A responsible jurist will be one who says, “This rule leads to the following results, which are socially undesirable for the following reasons.” In short, a responsible judge will have empathy.

Legality and Empathy:

<http://heinonline.org/HOL/LandingPage?collection=journals&handle=hein.journals/mlr85&div=71>

Programming Empathy: “Emotions in Human and Artificial Intelligence”

<http://www.sciencedirect.com/science/article/pii/S074756320400024X>

Intelligence and emotions differentiate humans from animals. Emotion is part of a persons behaviour and certain feelings can affect his/her performance, emotions can even prevent a person from producing an intelligent outcome. Therefore, when a computer aims to emulate human behaviour, not only should this computer think and reason, but it should also be able to show emotions. This paper presents a review of recent research that shows the importance of the emotions in human intelligence. This paper also presents the research that has been carried out into the incorporation of emotions to intelligent systems, how a computer can show affections and how to create intelligent agents that show emotions to other agents that communicate with them in the same environment.

Controlling Onward Transfers

- **Privacy**

What type of information is collected via online access? What does PII mean? What types of controls are in place to contain the data (legal, financial, social)? What technological mechanisms could be used to control the onward transfer of such information? How feasible are they? If PII is encrypted in storage, it must be de-encrypted upon use -- can you protect its transfer once de-encrypted? How do credit card companies handle purchases without giving the vendor the credit card number? Could that be used for other sensitive information?

- **Digital Book Lending**

What does the U.S. Constitution have to say about book lending -- both personal and governmental (e.g. a public library)? Assume that a statute implementing this conforms to Constitutional requirements. Assume that, initially, lending a book requires at least 1 day to be given, read, and returned. Now assume that books have gone electronic, and book lending is handled via almost instantaneous global passing around of simple tokens (i.e. assume that everyone already has a copy of the lent item, but can only access/decrypt it with a valid key). Thus, when a person stops reading a book, she simply turns off her reader, thereby automatically releasing the token to the online lending pool (e.g. the virtual library, a peer-to-peer network, etc.). Assume that, on average (as the number of books increase), 100 people can read a single book (e.g. spread, say, 10,000 people around the world trying to read the same book, and only 100 max would be reading the book at the same time -- only 100 tokens are needed among all 10,000 people). Before, it took approximately 1 book per, say, 5 people to be able to read it. The electronic version takes 1 book (i.e. token) per, say, 50-100 people. That is, the author now receives an order of magnitude less sales than before. Would this still be legal under the statute (e.g. fair use, exhaustion, etc.)? under the constitution (e.g. marketplace monopoly still valid)? Write a formulaic version of the statute and the constitutional requirements under the physical book model. Modify the function to accommodate the new problem -- that is, make the analysis a function of lending time, such that at a critical point the statute would no longer be constitutionally valid. What is the legal significance of that critical point from a values perspective? What were the assumptions in the statute that were rendered invalid by the introduction of technology? Can you find any other statute whose validity is based on expired or soon-to-be expired assumptions due to either existing or upcoming technology?

- **Digital Secondary Market**

<http://www.watchdox.com/>

Modeling Court Opinions

Human decision making may involve inconsistencies in belief of facts or of opinion, which is tolerated in the thought process. It's kind of a "lazy evaluation" of the "resolve inconsistency" routine (which uses "values" as input). Can/could computers handle logical inconsistencies? Do they? We see that court cases may well need to balance conflicting principles, and since judges differ on the relative importance of different values, they come to split decisions where both sides may often seem, at their face, completely reasonable. If computers handle such problems cleanly, could they reason similarly? Inputs to such an algorithm might be, for example, a value profile that weighs each conflicting principle and computes a decision based on the perceived value-score (e.g. $\text{sum}(\text{value-weight} * \text{value-score})$). Changing the weights would change the decision. Find an appropriate, recent, 5-4 split U.S. Supreme Court decision that fits this model. Find appropriate principles and weightings such that one can derive both sides of the opinion. Now do this for a case that has only a plurality, not a majority.

Rules versus Standards: Competing Notions of Inconsistency
Robustness in the Supreme Court and Federal Circuit

https://docs.google.com/file/d/0Bykigp0x1j92MTQzZTg1NDgtNDM5Yi00MDEwLTNmMGQtYzZkYWY5N2JlYWU4/edit?hl=en_US

Digital Courtrooms

General Requirements

Judge Dory Reiling, Ph.D., of the First Instance Court in Amsterdam, has posted slides of her June 2012 presentation entitled "Innovative Court Technology

<http://www.slideshare.net/doryreiling/innovative-court-technology-reiling-june-2012-13876547>

What would a digital courtroom look like? What aspects of a trial, or litigation in general, could be digitized? Are there any trade-offs?

Nationally Distributed Jury Pools

Under the U.S. Constitution's 6th Amendment, criminal defendants are guaranteed trials "by an impartial jury of the State and district wherein the crime shall have been committed." Imagine that a crime occurred as a series of related transactions across many states or simply nationally. Would it be reasonable to assemble a multi-state jury via teleconference? What might be the technical requirements for such a jury and trial?

Computational Analysis; Visualization

What does the anti-dilution formula in VC financing do? Describe what the plot below represents. Find other areas of law that are amenable to computational analysis or visualization (e.g. patent or court citations).

Is Code Law? -- Regulating Moving Violations

When I drive along Highway 280, I notice most people driving over the speed limit. I also frequently notice people pulled over getting tickets. With current smart-phone API's, could you design an app that would allow you to keep your speeding violation costs, including insurance, to, say, \$250/year, within a 90% probability? What data would it need (if it's not currently available, why not)? Would building such an app be ethical, legal? Should such a system put a limit on how far above the speed limit it would incorporate into its calculations, based on public safety?

Suppose that we wanted to simplify the entire moving violation mechanism and allow people to pre-pay for some level of violation by regularly billing them (fees to the state or county) and then, via automobile software, only allow them to drive within that fee-level violation range. Suppose

one could drive the speed limit for free. Perhaps one could drive more recklessly, say, by prepaying a larger amount each billing cycle, or by compensating for one day's excesses with a week's worth of driving the speed limit (after all, don't the probabilities of accidents and tickets all come out the same this way?). Wouldn't this just make more efficient, transparent, and rational, what already goes on, but without the added expense of the traffic police/court system? Would this incentivize governments to change speed limits to anything different than the current model incentivizes? Would it change highway safety mechanisms and budgets? Where in this system is: legal creation, legal enforcement, legal interpretation? What would [Raz](#) say? [Lessig](#)?

What is the relationship between this problem and, say, pre-filtering and fair use on YouTube?

Predicting, Detecting, and/or Preventing Criminality

What is the proper boundary between prevention and prosecution? Should we re-examine the exclusionary rule? What about DNA profiling everyone? Which crimes should or should not be punishable using snooped ("tainted", eavesdropped) evidence (i.e. illegal search or seizure resulting from evidence collected lacking probable cause or the equivalent)? If technology allows for privacy invasion, what are the proper boundaries between {privacy, anonymity, secrecy, ...} and {security, defamation, fraud, ...}? When should the NSA tell the FBI what it discovers? Whatever happened to the [FISC](#)? Which technology is OK to use to facilitate snooping, under which circumstances? Which technology is OK to use to prevent it, and under which circumstances? The [DMCA](#) makes it illegal to develop certain technology (e.g. [anti-circumvention](#)) -- is that [reasonable](#)? Can you realistically and effectively legislate away the threat of opposing, or criminal, technology, especially in an internet world?

http://www.cbs.com/shows/person_of_interest/

http://en.wikipedia.org/wiki/Minority_Report_%28film%29

<http://www.npr.org/2011/11/26/142758000/at-lapd-predicting-crimes-before-they-happen>

<http://www.newscientist.com/article/mg21128333.400-cops-on-the-trail-of-crimes-that-havent-happened.html>

Science Fiction and The Law

What kinds of legal systems have you come across in science fiction? What kinds of technology would be required to support them? Which technology, if any, is used only in a legal capacity (e.g. although email is used in law, it certainly is also used as a general tool completely unrelated to law)? What were the various interactions between people and machines, and what were the inevitable trade-offs?

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