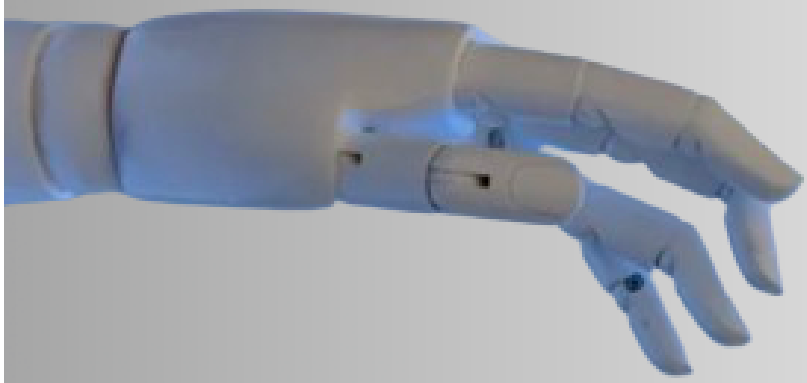
Jan 2024

AI LAW & INNOVATION INSTITUTE

UC LAW SAN FRANCISCO CENTER FOR INNOVATION (C4i)

UC Law San Francisco



January 2024

AI Law & Innovation Institute

UC LAW SAN FRANCISCO
CENTER FOR INNOVATION (C4i)

Join Us to Meet the Breathtaking New Challenges!

Law moves at human speed. AI moves at quantum speed. Our mission is to help courts, lawmakers, and administrative agencies adapt.

We bring together scholars, policymakers, and industry leaders to propose frameworks for responsibly encouraging and managing the effects of innovation. Working together, we can forge the best path forward.

New technologies are shaping the future. Government and legal institutions must evolve or be left behind.

What the AI Law & Innovation Institute Brings

The explosion of AI onto the scene provides exciting new, high-stakes challenges. Attention has focused on the disruptive potential of AI. But there is a gap between theoretical explorations and legal realities. UC Law is uniquely situated to bridge that gap, helping legal regimes facilitate innovation while circumscribing disruption.

The Institute will focus on the structures—the DNA—of legal processes. How can core legal systems—such as expert agencies and litigation—be enhanced? Where do we need additional structures or expertise?

Beyond AI, the next decade will bring challenges from robotics, synthetic biology, genetic engineering, and more. The Institute will help courts and agencies adapt to all these fast-paced technologies.

Advising Government on AI Regulation

The team has has worked with many government entities on the regulation of AI since 2016, assisting:

- **Congressional committees and state officials,** providing technical advice on the regulation of AI.
- The **GAO's Artificial Intelligence Report** to Congress on the future of AI.
- The **US Patent & Trademark Office**, at its Listening Session on Patents and AI Inventorship.
- The **Army Cyber Institute,** in its threat casting exercise on the weaponization of data.
- The **Federal Trade Commission**, at its hearing on Emerging Competition, Innovation, and Market Structure Questions Around Algorithms, AI, and Predictive Analytics.
- The **United Nations,** giving an address to the 2023 General Assembly Science Summit on the impact of AI delivered by Chancellor David Faigman.
- The **National Academies**, in their Workshop on AI and Machine Learning to Accelerate Translational Research, for the Government-University-Industry Research Roundtable.
- The **National Academies**, in their Workshop on Robotics and AI.

Key Personnel

Chancellor & Dean
David Faigman

William B. Lockhart
Professor of Law

John F. Digardi
Distinguished Professor of Law

*Faigman served on the **National Academies of Science panel** that investigated the scientific **validity of the polygraph** and is co-author to "Modern Scientific Evidence: The Law and Science of Expert Testimony," a multi-volume treatise that has been cited multiple times by the U.S. Supreme Court.*

*In addition, he has **published over 60 articles and essays**, as well as three books. Much of his scholarship focuses on the intersection between Science and Law.*

Director of C4i
Robin Feldman

Arthur J. Goldberg
Distinguished Professor of Law

Albert Abramson '54 Distinguished
Professor of Law Chair

*Feldman **provided testimony or technical advice to congressional committees**, federal agencies, and other government officials roughly **50 times** last year.*

*She is an **award-winning** scholar who has **published 4 books and 80 articles** in law journals including at Harvard, Yale, and Stanford, as well as in the American Economic Review and the New England Journal of Medicine.*

*In a recent **Supreme Court case**, briefs in support of both sides cited her work.*

Director of SLG
Paul Belonick

Professor of Practice,
UC Law San Francisco

*Belonick **directs C4i's Startup Legal Garage**, in which UC Law San Francisco students help build the legal foundations for startups in the ECVC ecosystem.*

*Belonick is a **summa cum laude graduate of the University of Virginia Law** School, where he was **Editor-in-Chief** of the Virginia Law Review.*

*He clerked on the **Ninth Circuit Court of Appeals** and has practiced civil and criminal law in both small and multinational law firms.*

Key Personnel

Alice Armitage

Director of Applied Innovation, LexLab

*Armitage is Director of Applied Innovation at UC Law San Francisco, which oversees **LexLab**. She has **founded two startups.** Her teaching focuses on "Technology and Innovation in the Practice of Law."*

*In addition to building out **new programs and courses** at UC Law SF, Alice's research interests focus on the intersection of **technology, design thinking, and regulation**.*

*Armitage is a graduate of **Yale Law School**, where she was the **first woman Editor-in-Chief of the Yale Law Journal** since World War II.*

Drew Amerson

Director, LexLab

*Amerson directs **LexLab**, an innovative hub at UC Law San Francisco focused on the **impacts that technology has and will continue to have on the law**.*

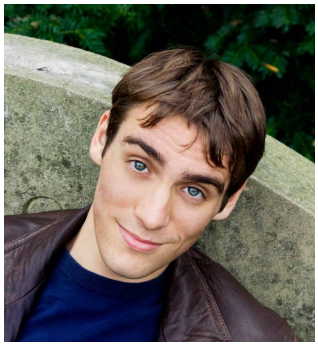
*Amerson received a JD from **Columbia Law School** before completing a fellowship with the **National Center on Poverty Law** and working as a business litigator with firms in Chicago and San Francisco. More recently, he **founded a legal tech company** that matched freelance attorneys with companies and law firms.*

Max Giella

Chief of Staff, C4i

*Giella's broad experience includes **U.S. Senator Jeanne Shaheen's office,** Jennifer Siebel Newsom's **nonprofit organization,** and an **international investment firm.***

*He also worked with **Lyft's Government Relations team**, where he collaborated with local, state, and federal bodies to advance rules and regulations that enabled Lyft to legally operate, with a focus on airports.*



Henry Koenig Stone

Communications, C4i

*Stone studied **economics** and **public policy** at the University of Chicago before moving to **communications** and **grant-writing**.*

*He has done work for the **Cleveland Clinic's Government Relations** department, within the **Virginia House of Delegates**, and with the PC(USA)'s **Advisory Committee on Social Witness Policy.***

*Stone's career commitment is to **support the common good** through effective policy communication.*

Key Personnel

Ramy Alsaffar

Senior Data Scientist, C4i

*Alsaffar is a **Fulbright scholar** and graduated from Louisiana State University in 2018 with a master's degree in computer science focused on **data science**. He joined the Center for Innovation in 2018 and serves as the Center's **Senior Data Scientist.***

*Alsaffar is responsible for understanding the dimensions of a problem, **building suitable models** to precisely address the problems at hand, carrying out appropriate **statistical analyses**, and revising the analyses' integration into prospective papers.*

Marcus Eagan

Affiliated Scholar, C4i

*Eagan is a respected voice in artificial intelligence, blending technical knowledge with a commitment to **open source community building.***

*Eagan helps maintain **Apache Solr.** He holds advisory roles in **Weaviate** and in **MongoDB**, where he introduced **Atlas Vector Search,** a **generative AI feature**. He is **CEO and Co-Founder** of AI infrastructure company **Trace Machina**, and an angel investor to dozens of startups.*

*Outside of work, Eagan mentors developers from underserved communities, seeking to **foster equitable opportunities** in the tech industry.*

Zac Henderson

Affiliated Scholar, C4i

*Henderson is the General Counsel of **Levels**, a digital health company that helps its members see how food affects their health in real time. In this role, he designed and implemented the company's **Artificial Intelligence policies**. He is a charter member of **TechGC** and a member of the **International Association of Privacy Professionals**.*

*Before Levels, Zac was a **litigator** in the Chicago office of **Kirkland & Ellis** and spent two years clerking on the **U.S. Court of Appeals for the Seventh Circuit.***

Joshua Chang

Data Scientist, C4i

Chang holds a master's degree in Business Analytics from the University of Southern California and a bachelor's degree in Marketing from Santa Clara University.

*He has experience developing **statistical machine learning models** and **neural networks** in the fields of marketing, fraud, and finance.*

Selected Publications on AI

The Center for Innovation has also made academic contributions bridging the divide between past legal precedent and the future of AI law:

1) ***Competition at the Dawn of AI*** (2019) proposes that for AI-generated works, companies should receive a shorter period of protection, enforced through the context of regulatory approval, in exchange for openness to the regulatory agency. This is modeled partially after FDA data rights for pharmaceuticals.

This paper highlights three potential issues with patenting AI-generated inventions:	
*	Timeline: A 20-year patent is an eternity for AI. When it comes to the speed of change, AI travels in an entirely different dimension.
*	Transparency: Where the invention calls for a method patent—for example, a method of using an AI to determine when a car hits the brakes, or whether an applicant will receive a loan—the limited disclosure norms in software patent law may not be enough. To gain societal acceptance of AI, policymakers and the public will want someone to look under the hood.
*	Collective contribution to creativity: To the extent that AI systems are deriving their creative results, in part, through the collective decisions of numerous people, can the AI's creativity be attributable solely to the program, or its operator, or its owner?

The paper argues further that it is neither socially desirable nor entirely coherent to list AI on patents, first because it would alter the incentives created when a person is listed as the inventor of a patent, and second because creating new rights held by AI might deter innovation.

Selected Publications on AI

2) ***AI Governance in the Financial Industry***; 27 Stanford J.L. Bus. & Fin. (2022), *with former SEC Commissioner Kara Stein*

This paper recommends a structure for the regulation of AI built on three pieces of structural scaffolding:	
*	Touchpoints: where AI most tangibly interacts with the broader financial system.
*	Types of evil: dividing potential harms inflicted by AI into the categories of "the evil you planned," "the evil you could have predicted," and "unpredictable harms."
*	Types of players: identifying actors as users, intermediaries, or creators of AI, and acknowledging that different harms may be reasonably predictable to the AI creator, for example, than to the user, or to actors in other fields.

3) ***Artificial Intelligence: The Importance of Trust and Distrust***; 21 Green Bag 2d 201 (2018)

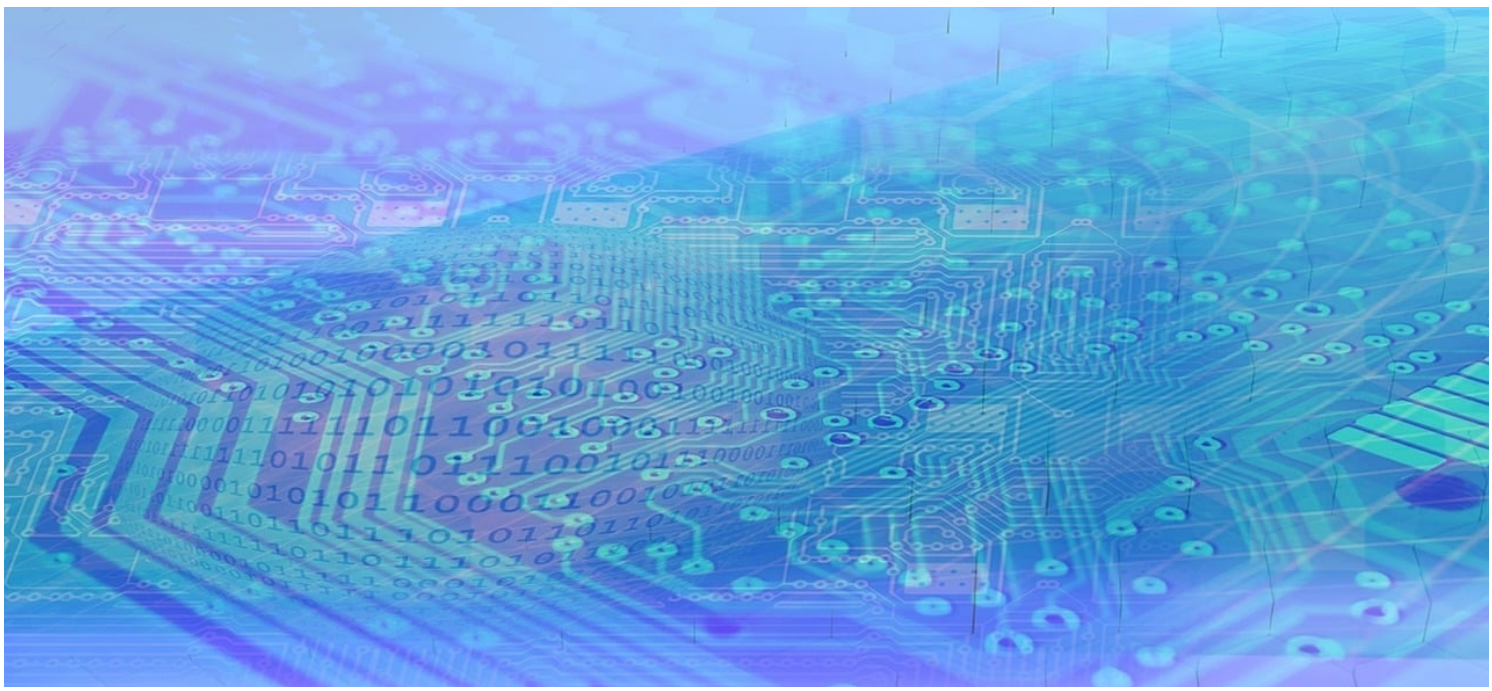
Flowing from an Army Cyber-Institute threat casting exercise and published 18 months before COVID-19 emerged in China, this paper:	
*	Hypothesizes a public health emergency arising out of Asia that disrupts the U.S. healthcare system and creates distrust of government information. (The hypothesized scenario originates from data corruption, not from a biological virus).
*	Predicts that some US sub-populations will look for other sources of information that are not uniformly reliable or of the best intentions.
*	Proposes that "AI systems should be subject to review entirely outside the system itself – either industry bodies or public bodies. As an average citizen, I may never understand how a biologic interchangeable is being produced, at least not enough to trust that the drug is safe. Nevertheless, I might trust the FDA. This form of institutionalized outside review, whether by private or public entities, will be essential for adequate trust and distrust."

Selected Publications on AI

4) ***Artificial Intelligence in the Health Care Space: How We Can Trust What We Cannot Know***; 30 Stanford L. & Pol'y Rev. 399 (2019)

This paper suggests that "the pathways we use to place our trust in medicine provide useful models for learning to trust AI. As we stand on the brink of the Al revolution, our challenge is to create the structures and expertise that give all of society confidence in decision-making and information integrity."

This paper proposes that a government body could create and regulate standards to:	
*	Document a dataset's purpose, intended use, potential misuse, & areas of ethical/legal concern.
*	Provide information integrity requirements for accuracy, completeness, and archival purposes.
*	Address when conflicts of interest arise between cost savings from deploying Al and quality of patient/consumer care.



A Deeper Dive:

Artificial Intelligence Law & Innovation Institute

at

UC Law San Francisco

UC Law San Francisco, the original law department of the University of California and a leader in research regarding technology, innovation, and law, is establishing a new Artificial Intelligence Law & Innovation Institute ("The Institute"). Its mission is to help legal processes align with the pace and magnitude of changes wrought by artificial intelligence (AI) and other emerging technologies. The Institute will bring together scholars, policymakers, and industry leaders in the school's state-of-the-art Academic Village to propose frameworks for managing new technologies.

"The fundamental legal question presented by emerging and advanced technologies…is how law's regulatory apparatuses can meet the timescale posed by these technologies. This is the problem that the Institute will seek to study and solve."

I. The Problem: AI, Innovation, and the Limits of Legal Processes

The need to reconsider fundamental legal processes in the face of emerging and advanced technologies is manifest. Historically, technology has advanced on a human scale. The first movable type printing press was invented around 1000 AD, but it took more than 400 years before Gutenberg's metal printing press emerged. The first automobile was built around 1866, but mass production of automobiles did not begin until 50 years later with Henry Ford's invention of the assembly line. The law similarly operates on a human scale, with governing bodies and rules of procedure, process, and adjudication that endure for years, and sometimes decades or centuries. As long as technologies make human-scale advancements, their regulation through judicial decisions (the "common law"), or through legislation and administrative rulemaking, can be generally effective.

This is no longer the case. Although the law continues to operate on a human scale, modern technical advances operate on what might be termed a "quantum scale".[1] AI has

[1] This use of the concept of quantum-scale advancement is not to directly reference the actions of atomic and subatomic principles. Rather, as a metaphor, it captures aspects of quantum physics that apply to technological advances, including:

The Fabulous New Conference Space in our Academic Village

moved at a speed that would take many lifetimes for other industries.[2] The advancement between generations of AI programs in a short span of time would be analogous to the difference between IBM's primitive touchscreen phone in 1994 and tablet technology 25 years later.[3]

Processing power is increasing exponentially, making blistering advances in software and hardware possible; self-driving cars have become a fixture on city streets; artificial intelligence has exploded in multiple domains, including composition, photography, film, fine art, medicine, science, and music; and genetic engineering is revolutionizing medicine. Innovation in each area provides unique opportunities and risks, placing significant time pressure on the processes of courts, legislative bodies, and regulatory agencies.

Meanwhile, the benefits and risks of future technical advances are inherently uncertain. Legal mechanisms, whether regulatory or litigation-related, thus present the prospect of

---

1. Discreteness: Just as quantum systems have discrete, "jump-like" behaviors (e.g., an electron moving between energy levels without occupying the space in between), technological innovations often feel like they make sudden leaps forward rather than gradual progress.
2. Non-intuitiveness: Much as quantum mechanics defies classical intuition (e.g., Schrödinger's cat being both alive and dead until observed), technological advancements can sometimes be surprising, disruptive, and hard to predict.
3. Entanglement: In the same way quantum particles can become entangled and affect each other regardless of distance, our globally connected tech world shows how innovations in one part of the world can quickly influence and change systems in another.

[2] See Feldman, Robin. "Artificial Intelligence: The Importance of Trust and Distrust" (p. 203). Green Bag, Vol. 21, no. 3 (2018).

[3] *Id.* (See the comparison of advances in versions of Google's AlphaGo program to the differences between IBM's Simon and the iPad Pro).

being over-inclusive or under-inclusive. There is no simple solution to the inherent uncertainties associated with regulating technology.

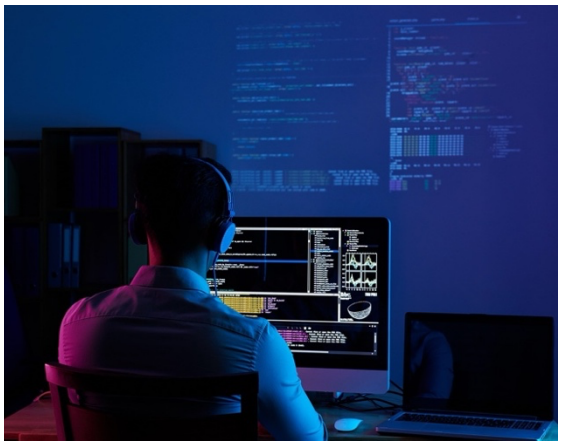
State and Federal officials have begun to offer regulatory frameworks to address the particular threats and enormous opportunities that AI poses. For example, California Senator Scott Wiener introduced the Safety in Artificial Intelligence Act in February 2023 in Senate Bill 294. The Bill proposed a framework for testing for safety risks, liability for damages, and a cloud-based computer cluster available for AI researchers to access. At the federal level, President Joe Biden issued an Executive Order on October 30, 2023, which set out new standards for safety, security, and privacy for AI technology.

These are excellent early steps, but will be insufficient to meet the wide array and considerable depth of challenges and opportunities that advanced technologies will continue to pose. Sustained academic research and analysis are needed to facilitate effective legal reforms to meet the challenges that breakthrough technologies will bring.

The fundamental legal question presented by emerging and advanced technologies, such as artificial intelligence, robotics, synthetic biology, and genetic engineering, is how the law's legislative, regulatory, and judicial apparatuses can meet the timescale posed by these technologies. This is the problem that the Institute will seek to study and solve.

II. Scope of Work

Much research effort has been focused on AI's effects on society, ranging from mental health consequences on children to disruptions of entire industries and professions. This work is extremely important, and it will ultimately help inform the work of the Institute. However, instead of thinking about the opportunities and challenges emerging with the recent leaps in AI, the Institute will focus on the structures—the DNA—of the legal system. Specifically, do core legal systems—such as expert agencies and litigation structures—need to be reformed and, if so, *how* should they be reformed to manage emerging and advanced technologies.



The issues reach well beyond large language models like ChatGPT and Google Gemini. Rather, AI challenges government to evolve so that it can handle any difficulties AI generates across time. And as modern technology throws down the gauntlet, the Institute is here to pick up the challenge.

Although AI is a leading candidate for the Institute's attention, the work will potentially extend to all emerging and advanced technologies. Beyond AI, in the next decade we are likely to confront challenges and opportunities associated with robotics, synthetic biology, genetic engineering and sundry other technologies, as well as interactions among these technologies.

The Institute will thus begin by researching and developing appropriate mechanisms for legal reforms to meet new statutory and regulatory needs brought about by the prevalence of artificial intelligence. More expansively, the Institute will also examine other quantum-scale technologies and propose means that the legal system can proactively adapt.

III. Academic Efforts to Date by Other Institutions

Existing institutes that touch upon artificial intelligence center their research on the social impacts of AI and what lawyers should know about it. University of California Irvine has an Artificial Intelligence Public Policy Institute focused on the impact of AI. The Berkeley Law AI Institute hosts events to disseminate information to legal professionals to inform legal decisions from a corporate lens. The Berkman Klein Center for Internet and Society at Harvard University has created the Initiative on Artificial Intelligence and the Law that examines the impact of artificial intelligence on consumer protection, civil rights, misinformation, privacy, false advertising, and investor protection. These important initiatives, however, primarily focus on the effects of AI, rather than considering legal processes that can best be tailored or created to promote or mitigate their impacts, as appropriate.

Other research centers, such as the Center on Civil Justice at NYU School of Law, Yale Law School's Information Society Project, and UCLA's Institute for Technology, Law, and Policy (a partnership between the engineering school and the law school) focus more broadly on the social impact and needs for policy reform caused by technological shifts of all kinds. Given that these centers have a much wider

range of social issues to address, limited focus is given to the legal structures needed to respond to the quantum-speed technological advancements that the Institute will focus sharply on.

The Institute will be equipped to dive into these legal issues in the context of AI as well as robotics, CRISPR, and other technologies that require study from a legal, ethical, and regulatory perspective so as to minimize harm to society at large.

Programs at UC Law SF have already engaged in work that sets an appropriate foundation for this work. In addition to providing advice on regulation of AI for numerous federal and state governmental entities, the Center for Innovation worked with former SEC commissioner Kara Stein to recommend an initial structure for the regulation of AI in the financial industry. Meanwhile, in the Fall of 2023, LexLab constructed a generative AI Legal Tech market map that tracked the disparate ways that AI has been brought to bear on the field of law. Startup Legal Garage, which provides free legal assistance to 50 startup companies a year, has begun canvassing that landscape.

IV. Synergies Among Emerging and Advanced Technologies

The Institute's focus on the legal frameworks applicable to emerging and advanced technologies allows the exploration of numerous synergies, both in terms of combinations among these technologies and in terms of the common denominators shared by these technologies.

a. Hybrid Technologies

Most of the emerging and advanced technologies, existing today and on the horizon for tomorrow, are combinations of technologies; they are technological hybrids. Self-driving cars, for instance, inextricably combine robotics and AI. Virtually all robots will be AI driven creatures. Similarly, many technological medical applications will combine AI, genetic engineering and, possibly, robotics. It is the very nature of technological progress that innovations will borrow and improvise across platforms. The Institute begins with this presumption.

b. Common Denominators

Just as there is a seamlessness in emerging hybrid technologies, from a legal standpoint, many disparate technologies present overlapping legal challenges. One of the aims of the Institute will be to identify themes—common denominators—that suggest the value of particular regulatory structures.

One fundamental distinction present in most technologies is whether they are centralized and, as a consequence, might be amenable to specific forms of regulations. Smart phone hardware, for example, is highly centralized so that a regulation enacted in one jurisdiction—say to require a common charger—will impact the manufacture of the hardware and thus be effectively applicable in all jurisdictions. However, a large proportion of technological innovations are decentralized, such that they manifest differently for different users. Much of the current library of AI tools and some of the most dangerous AI threats to the financial markets are essentially decentralized. In the context of decentralization, the Institute will look for touchpoints where the disparate actors connect with systems that are more easily regulated, or for legal models that can be used across circumstances.

V. Conclusion

As a law school located next door to Silicon Valley, a multitude of AI startups, biomedical research institutes, and the Northern District of California and Ninth Circuit, UC Law San Francisco is well-situated to explore the law's responses to emerging and advanced technologies and convene scholars, policymakers, and industry leaders to propose new frameworks to manage new technologies. The school combines a history of legal academia with its groundbreaking programs at the Center for Innovation, which already connect to varied startups and emerging technologies, as well as government officials. This synergy will enable the Artificial Intelligence Law & Innovation Institute at UC Law San Francisco to distinguish itself in two essential ways.

First, it will focus primarily on the legal frameworks—regulatory and judicial—that can be formulated to advance the benefits, and reduce the risks, of emerging and advanced technologies. The primary concern will be with the fabric of the law, its DNA, and how the law might best manage these new frontiers.

Second, the Institute's portfolio will extend beyond AI to encompass other emerging and advanced technologies, including robotics, genetic engineering, and synthetic biology. The Institute will consider combinations of these technologies, since these hybrid technologies are likely to raise challenges beyond what a single technology may pose.

Legal scholarship in the modern era requires multidisciplinary, proactive thought if it is to keep pace with quantum leaps in technological innovation. UC Law San Francisco is prepared to lead the way.

Contact Information

For general **press questions**, please contact Professor Robin Feldman at *feldmanr@uclawsf.edu.*

To join our stakeholder **mailing list**, please contact Henry Stone at *stonehenry@uclawsf.edu*.

To **support our work** financially, please contact Max Giella at *giellamax@uclawsf.edu* or visit our website (QR code below) and click "Donate to the Center."

www.uclawsf.edu/center-for-innovation/

Location:
200 McAllister,
San Francisco, CA. 94102,
Suite 634A (6th Floor)

Thank you for your support!


UNIVERSITY OF CALIFORNIA
SAN FRANCISCO
1878
COLLEGE OF THE LAW
UC Law
San Francisco
SPLAT
THE LAB