

Proposed Research – University of Cambridge

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The status of *information age* inventions as patentable subject matter is one of the most controversial legal, policy, and socio-economic debates of the 21st century.

While there is clarity with regards to the patent eligibility of *industrial age* technology (e.g., machines, articles of manufacture, compositions of matter), there is currently a high degree of uncertainty with regards to the patentable subject matter eligibility of *information age* inventions (e.g., information process inventions, smart systems that rely on programmed processors implementing data science and signal processing algorithms, computer-implemented inventions, software, biotech).

Given the complexity of the legal, policy, and economic issues involved, the patent offices and judicial bodies on both sides of the Atlantic have struggled to formulate a clear test for determining whether and under what circumstances such information age inventions should be patent-eligible subject matter or be excluded from patent protection. As an example of the complexity underlying this question, the same hardware (e.g., a microcontroller) can result in different and novel smart devices depending on how it is programmed. Consequently, this universal and generic computing machine can be *transformed* into other *specialised* machines by incorporating application-specific information process (data science) algorithms. The result is that the same underlying hardware can be transformed in diverse smart devices, for example, a medical device for personalised diagnosis and treatment that analyses patient-specific physiologic data and uses mathematical relationships to improve precision diagnosis, a navigation system, or a controller for an industrial plant. The legal difficulty lies in that the underlying hardware is known and therefore not patentable, and all the novelty and inventive step lies on the mathematical methods (information processing, data science, algorithms) that when programmed on the non-novel hardware create a new special-purpose device.

The objective of this research is to conduct an in-depth legal analysis of key US Supreme Court decisions affecting biotech (*Mayo v. Prometheus*) and computer implemented & information process inventions (*Alice Corp v. CLS Bank*), as well as the corresponding UK and EPO case law in order to: 1) better understand the legal, economic, and potential innovation impacts of these judicial decisions, 2) compare the patent law jurisprudence and potential of substantive patent law convergence between US and EPC signatory jurisdictions, and 3) propose a new legal test and subject matter eligibility examination framework for information age inventions that is clear, consistent, innovation enhancing, and potentially uniformly applicable in jurisdictions signatory of the *Patent Cooperation Treaty (PCT)*.

This research draws from my background in engineering, patent law, and commercialization of technology-based innovations. In particular, my experience as an engineering researcher¹, inventor², patent practitioner³, licensing professional⁴, and entrepreneur⁵ is very valuable to approach this research topic from its various constituent lenses: legal, licensing, economic, commercialisation, engineering, and scientific research. The *Centre for IP and Information Law (CIPIL)* at the Faculty of Law of University of Cambridge is the ideal place to conduct this research effort. This research will both benefit from and complement ongoing CIPIL research efforts such as the work of Dr. Kathleen Liddell and her team involving the impact of *Myriad Genetics* and subsequent patent-eligibility case law on biotech.

¹ Author of 50+ peer-reviewed publications in leading engineering journals.

² Inventor of 20+ issued patents in the USPTO.

³ Patent practitioner with Bar admission to practice patent law before the USPTO and with 30+ patent cases prosecuted to allowance in the US in the last 4 years.

⁴ Certified Licensing Professional (CLP)

⁵ Co-founder of a university-startup medical device company whose vision is to improve the quality of life of patients with movement disorders such as Parkinson's disease through personalized/precision diagnosis and individualized therapy using patient specific physiologic data. APDM Inc (www.apdm.com).