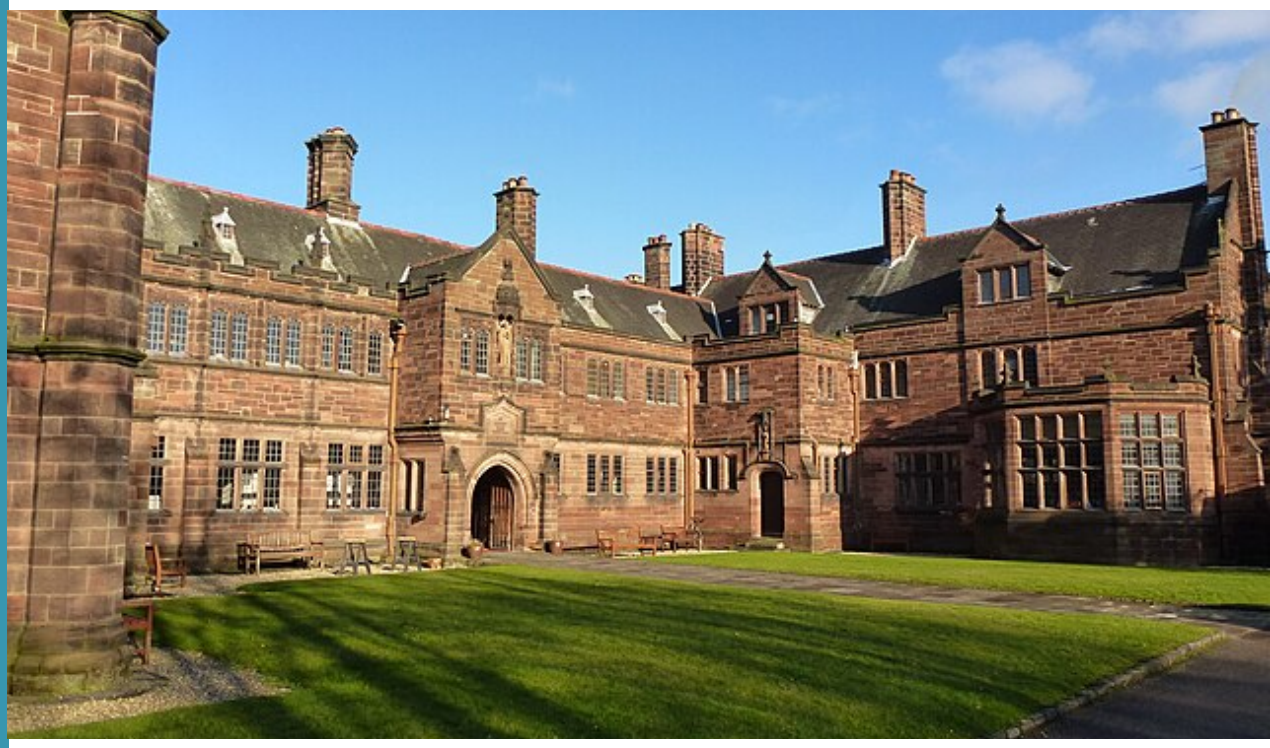
2ND – 3RD OCTOBER 2023

# BEYOND BOUNDARIES: PERSONS, (BIO)TECHNOLOGIES, & THE LAW



# WORKSHOP REPORT

EVERYDAY CYBORGS 2.0

WHERE SCIENCE & TECHNOLOGY MEET HUMANITY

HYBRID • MINDS

# INTRODUCTION

Everyday Cyborgs – or integrated persons – are persons with attached and implanted medical devices, such as pacemakers, insulin pumps, limb prostheses, and neuroprostheses. The increasing integration of these devices with persons blurs the boundaries between bodies, minds, persons, things, and the world in general. Given this, the integration of these technologies raises difficult legal, philosophical, and other questions. Although these devices are clearly things before they are implanted, once they are implanted and integrated into people's bodies and minds, they play similar roles to body parts or organic mental capacities. The question then arises: should we consider these devices body parts, parts of our minds, mere things, or something else entirely?

In October 2023, the Everyday Cyborgs 2.0 and Hybrid Minds projects co-hosted the Beyond Boundaries workshop. The event at Gladstone's Library, Hawarden, brought together an interdisciplinary group of scholars including lawyers, clinicians, sociologists, and philosophers to explore the implications of this blurring of boundaries consequent on recent advances in bio- and neuro-technologies.

The workshop sought to address questions such as:

- Does the law need to uphold traditional distinctions and boundaries?
- What might the consequences be of dissolving different (conceptual and other) boundaries?
- How and where should the boundaries be drawn?
- Could they be reconceptualised in novel ways?
- What novel categories might be required? Is categorisation strict or flexible?
- Is it exclusive, pluralistic, and/or context specific?
- What are real legal problems that require an answer?
- What are the pressing ethical concerns?
- Are there pragmatic legal solutions to the more theoretical abstractions and concerns?
- And, if so, what might these look like?

## NED BARKER – HYBRID BODIES IN PAIN: RAISING SOME SOCIAL, ETHICAL, AND LEGAL CONSIDERATIONS

Our bodies are increasingly monitored. Fitness trackers measure our heartbeats and count our steps. They assist us in exercise and at work. In his presentation, Dr Barker considered how the increasing integration of technology with our bodies forces us to consider the question of how to live well as bio-hybrids though the medium of a short film produced in collaboration with a video-artist. He then reflected on how pain features in our relationships with technology. Drawing on sociological and ethnographic resources, he provided an account of pain and its significance.

Dr Barker argued that pain transcends traditional boundaries in that it is neither completely bodily nor entirely mental, manifesting as both. When pain does manifest, it is hard to ignore for the person experiencing it. At an ethical level, pain is frequently moralised. Pain is (generally) bad, and causing it is often wrong. Pain, however, is often invisible to others. There are thus difficult epistemological problems surrounding how we can establish whether someone is in pain (or how much pain they are in). This has important implications for the law. In some legal situations (such as those involving awarding damages), it is important we establish the magnitude of pain someone is experiencing (as this might influence damages, for example). However, doing so is difficult because pain responses seem to be inherently subjective.

## TUGBA BASARAN AKMAZOGLU – FROM PERSONS AND THINGS TO THE SYMBIOSIS OF PERSONS AND SMART THINGS: ANTICIPATING THE LEGAL CONCEPTUALIZATION OF BCI-CONTROLLED PROSTHESES

Brain Computer Interfaces (BCIs) are becoming increasingly prevalent and capable. People who use these technologies become deeply enmeshed with them. These BCIs can become incorporated into their body schemas and affect their sense of self. When these devices become integrated in this way they challenge the boundaries between people/things and organic/inorganic.

Brain Computer Interfaces (BCIs) are becoming increasingly prevalent and capable. People who use these technologies become deeply enmeshed with them. These BCIs can become incorporated into their body schemas and affect their sense of self. When these devices become integrated in this way they challenge the boundaries between people/things and organic/inorganic.

Law is a living, flexible entity. When confronted with new technologies that blur traditional boundaries, the law faces a choice. It can either consider BCIs a privileged form of property or part of a person; neither option is precluded.

## DENISA BUTNARU – THE VULNERABLE EXPERT: ON EPISTEMIC REDISTRIBUTIONS IN REHABILITATION WORLDS WITH EXOSKELETONS

Exoskeletons are external devices worn by users to help them perform certain motor functions. Exoskeletons are used in a variety of contexts. When used in the context of the rehabilitation of people who have suffered a stroke, play a clearly therapeutic role, helping people recover lost mobility and reconceive what is possible. In other contexts, such as industry and the military, they play both an enhancement and protective role, enabling people to perform tasks such as lifting heavy loads or working overhead more easily and with a lower risk of injury.

Dr Butnaru's presentation drew on her extensive ethnographic fieldwork in rehabilitation centres, tradeshows, and research facilities. Her ethnographic research revealed that coming to embody an exoskeleton is no easy task. In order for these proximity technologies to be useful, the body and the device need to achieve a close fit, meaning that exoskeletons often need to be adapted to individual users. Users, however, also need to adapt to the technologies, as the use of exoskeletons can alter people's phenomenological experience of their own mobility.

Using an exoskeleton successfully also requires learning how one's body interacts with the exoskeleton, leading users to develop new corporeal repertoires. Dr Butnaru's empirical research revealed that, far from being a one-way process, developing a successful exoskeleton requires collaboration between researchers and users. This process is not conflict free, as these two groups develop different forms of knowledge which can be hard to integrate.

## ROBERT CLOWES – INCORPORATING AI IN OUR COGNITIVE AND AFFECTIVE LIVES AS EXTENDED MINDS AND VIRTUAL PERSONALITIES: A COMPARATIVE ANALYSIS

People increasingly rely on technology to store and retrieve information, remember things, and organise our lives. According to the extended mind thesis, if we rely on these informational resources in the right way, they become part of our minds. In some cases, the information relied on is controlled and owned by the person using it (e.g. information in a personal calendar). In many other cases, however, the information we rely on is controlled and owned by others. This is the case, for instance, when we rely on information on websites or mobile applications.

In his presentation, Dr Clowes outlined three ethical issues that arise when the informational resources we rely on are controlled or owned by others. First, there are risks to mental privacy. Whereas it is impossible to access the thoughts in people's heads, the data stored on cloud servers is much open to surveillance. Second, there is the risk of manipulation. Although you can make people come to have particular beliefs by informing them of something (or lying to them), the recipient of the information has to judge and accept it in order to form their own belief. When the information is stored on a server, however, it is much more vulnerable to being interfered with or changed, making manipulation a greater risk. Third, there are risks to agency. The more we use technology to store information, the more we become bound up and influenced by it, putting our sense of agency at stake.

## ANTONIA CRONIN – THE CASE OF THE BIOARTIFICIAL PANCREAS: ON REGULATORY BOUNDARIES, OVERLAPS, AND GAPS

Bioartificial pancreases are a rapidly developing area of technology which, if successful, offer a potential cure for type 1 diabetes. They consist of both cellular and non-cellular components, combining human pancreatic islets with an artificial structure that supports their growth. Despite their revolutionary potential, these devices pose regulatory challenges.

Regenerative medicine solutions such as bio-artificial pancreases are currently regulated under the EU regulations for Advanced Therapy Medicinal Products (ATMPs) and would likely also be subject to EU medical device regulations. These regulations, however, are poorly adapted to technologies such as the artificial pancreas in which the functioning of the cellular and non-cellular components are co-dependent, with neither one being more important than the other.

Dr Cronin argued that the highly complex and burdensome regulatory regime could be simplified by adopting a new classification of hybrid ATMP which fully captures the complex interaction between the biological and device components of bioartificial pancreases.

## TALYA DEIBEL – ON NEUROHACKERS AND CYBORGS: LEGAL PERSONALITY AND ITS OPEN FUTURE

The boundary between people and things is one of the foundations of our legal systems. Increasingly, however, the firmness of this boundary is being tested by recent developments in neurotechnology. The result is a plethora of legal problems. The notions of personhood, property, and privacy fall short when confronted with cyborgs who blend the biological and the technological. As a consequence, the traditional legal remedies we rely on may no longer be applicable.

The situation, however, is not unprecedented. In her presentation, Dr Deibel argued we shouldn't underestimate the law's ability to compromise. Private law in particular has a long history of making new distinctions in the face of uncertainty and societal change, including distinctions that replace or transcend previous boundaries. The notion of being a person, for instance, was not originally co-extensive with being human. Being a person, in Roman law, was intrinsically tied to the status of being an owner, and the notion excluded women and slaves.

Instead of seeking to hold on to existing dualistic boundaries, Dr Deibel argued, we need new starting points. Solving these boundary problems will require focusing on developing a new pluralistic methodology to deal with the increasing hybridity that the everyday cyborg represents.

## LAURA DOWNEY AND JOSEPH ROBERTS – EVERYDAY CYBORGS & MEDICAL DEVICES: CHALLENGING (THE NORMATIVE SIGNIFICANCE OF) BOUNDARIES & BOUNDARY WORK IN LAW

Boundaries play a vital role in law, parsing the world, and establishing distinctions between things, including legally inflected ones. However, these boundaries do not always stand up to scrutiny. The actuality of the everyday cyborg, for instance, challenges the traditional distinctions between people and things, and the tangible and the intangible.

In their presentation, Dr Downey and Dr Roberts, explored how law's boundary work; that is, how the law utilises and incorporates supposed ontological and moral boundaries into its structure and norms.

They considered whether and how the categories of person, thing, tangible, and intangible could be expanded or supplemented to better account for medical devices which straddle the boundaries between them. They concluded that, although it might be tempting to re-draw the ontological boundaries, if our goal is ensuring we properly account for people's interests in attached and implanted medical devices, it may be more fruitful to challenge the normative significance of the boundaries between people/things or tangible/intangible. In other words, instead of determining what rights people should have on the basis of which side of these boundaries they fall, we should focus directly on the normative question of what protections people deserve over their medical devices.

## ANDREA MATWYSHYN – EXPLOIT MACHINA

All code has bugs and security vulnerabilities. As more and more of our software enabled devices become internet connected, these vulnerabilities become increasingly significant. Medical devices are no exception. Many medical devices run software, collect data, and transmit it wirelessly. Recent hacks of US and UK hospitals show us that, if the software contains bugs, these devices are at risk of being locked down, or the data they contain being stolen or interfered with.

In her presentation, Professor Matwyshyn argued that we should be especially concerned about the cybersecurity of medical devices as the consequences of a cybersecurity incident are likely to be much more significant than the consequences of a hack of other internet enabled consumer products. As well as the economic harms that come from having to replace a compromised product, in the case of medical devices there are also risks of bodily injury from malfunctioning or bricked devices, and harms to people's mental health.

These problems are exacerbated by industry's economic model based on building things quickly and shipping them to consumers without adequate safety testing. Professor Matwyshyn argued that there are two main approaches to mitigating these risks. First, we could mandate threat meta-modelling, a process whereby the security of each individual component of a system is assessed. Second, we could establish new technology safety regulators to ensure the cybersecurity of devices.

## AISLING MCMAHON - PATENTS OVER NEURALINK BRAIN COMPUTER INTERFACE 'TECHNOLOGY' AND RIGHTSHOLDER(S)' GOVERNANCE FUNCTIONS: A BLURRING OF THE 'TECHNOLOGICAL' AND HUMAN BODY WITH SIGNIFICANT BIOETHICAL IMPLICATIONS

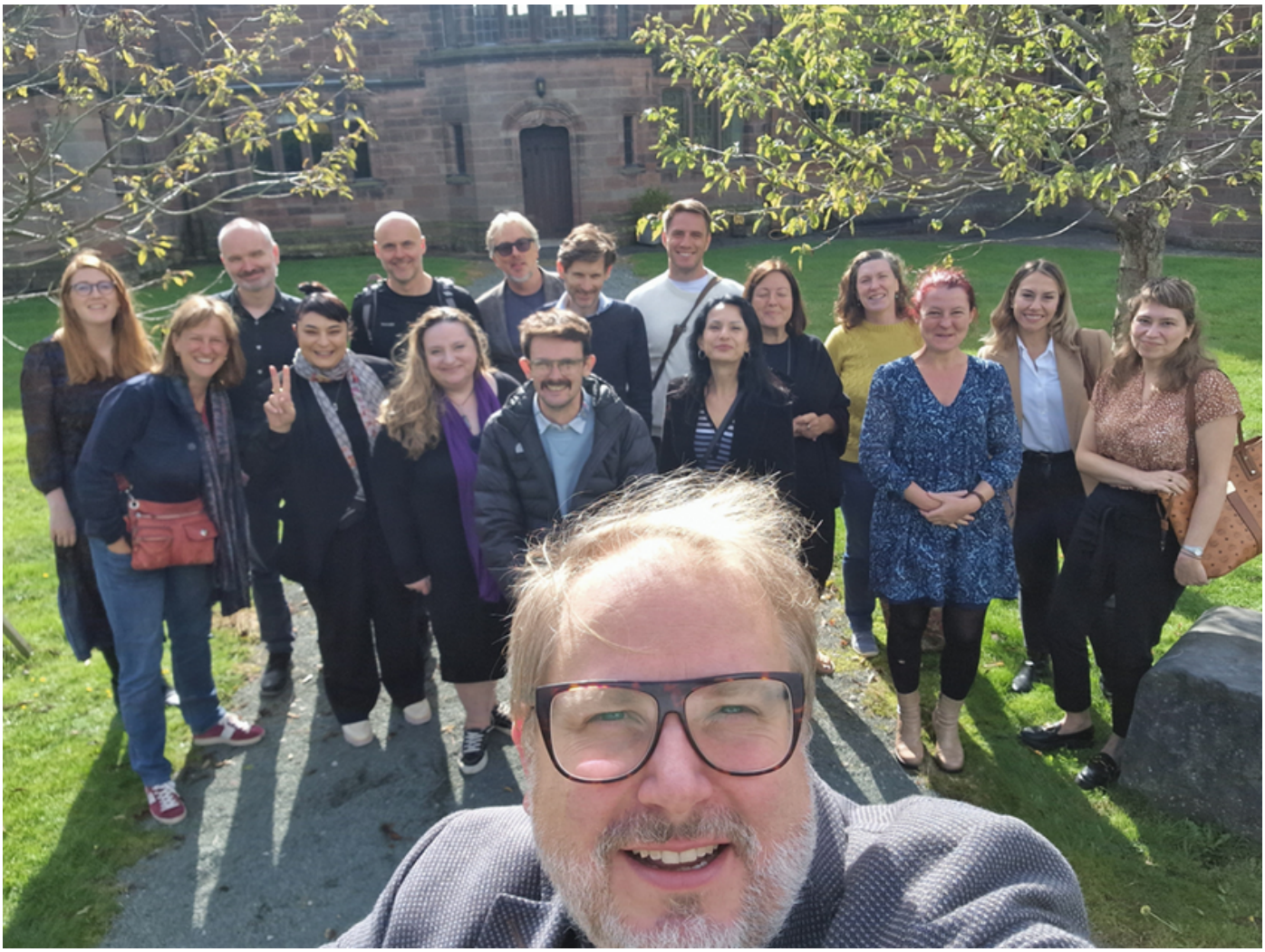
Technologies like Neuralink and other BCIs have the potential to improve lives by helping people communicate with both other humans and machines. However, they also blur the boundary between a person's body and a thing. In her presentation, Professor McMahon considered whether technologies like BCIs are patentable technologies. In general, patents are available in all areas of technology. However, European intellectual property law states that the human body itself is not patentable. This raises a number of questions surrounding the patentability of technologies like BCIs which are so intimately connected with the human body.

One reason a technology can be excluded from patentability is if it is contrary to public order or morality (Article 53(a) European Patent Convention). Making a case that BCIs are contrary to morality, however, is likely to be difficult as the test establishes a high threshold. To be excluded from patentability, the intervention must be so abhorrent that the public in general would regard patenting it as unconscionable. The associated guidelines for applying the prohibition suggest it must be used only in the most exceptional circumstances, and no patents have been denied on this basis to date. Therefore, it is unlikely that BCIs such as Neuralink would be excluded, meaning BCIs are likely patentable.

## MELIKE SAHINOL - SOCIO-BIO-TECHNICAL CONSTELLATIONS IN CYBORG ACTION

Brain-Computer Interfaces are at the forefront of neuroscientific research have the potential to improve the lives of chronic stroke patients. These devices enable us to both establish a direct communication pathway between the brain and an external device, and allow us to measure and study the brain activity of those who have them implanted. Using these devices, however, requires a socio-bio-technical adaptation process. Drawing on her extensive participatory observation and ethnographic studies of neuroscience research environments, Dr Sahinol's presentation provided an analysis of the micro-processes involved in ensuring these devices work for users.

Her ethnographic research in hospitals, neurological research centres, and surgical settings revealed that, far from being passive recipients of these technologies, patients and neuroscientists have to work together to calibrate the devices. Doing so takes time and requires a process of mutual adaptations. Patients have to learn how to imagine the right actions to generate the right brainwaves, a process which reconfigures a person's brain and, therefore, their subjectivity. The machine, in turn, needs to learn to recognise these brainwaves in order to produce the right movements. Delving deep into the realities of using a BCI thus serves to dispel myths about cyborg action, revealing the process to be symbiotic and a site of vulnerability for users.



# FUNDING

This workshop was made possible thanks to the generous funders of the Everyday Cyborg 2.0 and Hybrid Minds Project.

The Everyday Cyborg 2.0 project is supported by a Wellcome Trust Investigator Award in Humanities and Social Sciences 2019-2025 (Grant No: 212507/Z/18/Z)

The Hybrid Minds project is a German-Swiss-Canadian collaboration funded in 2021 through the ERA-Net NEURON program by funding agencies from all three countries (Grant No: 01GP2121A)