Recent advances in the technologies associated with wearable computing, virtual environments, and computer-mediated realities (augmented, diminished, or otherwise computer-modified) are generating a number of important and very challenging legal, ethical, and policy issues.

We use computers with opaque (fully mediated) and see-through (partially mediated) displays to enter into computer-mediated environments (virtual, augmented, enhanced, or deliberately diminished), to modify our view of the real world by images, graphics, text, and so on, as well as to change, mediate, and alter reality in unique and novel ways (see the paper by Steve Mann, “Sousveillance and Cyborglogs: A 30 Year Empirical Voyage Through Ethical, Legal, and Policy Issues”).

As we begin to closely integrate computers and sensors into our cognitive, visual, and haptic feedback loops, not only are virtual environment and mediated-reality technologies becoming more common, but the distinction between human and machine itself is blurring. In our present era, it is already possible for a human being to be augmented by various machine parts, including retinal prosthesis, artificial hips, hearts, kidneys, and limbs and heart pacemakers. Further, we have recently witnessed the human implantation of sensors under the skin and technological breakthroughs in the area of interfacing microchips directly into the human nervous system. It may not be long before ethics boards and courts will be confronted by a question that is not easily answered: “where does the human end, and the machine begin?”

Perhaps more germane to this special edition, many people are experimenting with various forms of integrating humans and machines involving wearable and reality-mediated computers.

In terms of virtual environments, one can use head-tracked HMDs to become immersed in computer-modified worlds, and using see-through displays (illusory transparency or partially mediated transparency), one can project computer-generated images in the real world environment in which we live. Networking also allows multiple users to enter the same virtual environment or community at the same time and to interact in rich and diverse ways not possible just a few years ago.

We are now technologically capable of building on-line virtual or computer-mediated communities, where people can spend significant amounts of time. In these worlds it will become pertinent to ask a host of questions. For example, should there be any ethical rules, laws, or policies to govern virtual interactions? What happens when the real and virtual merge, or when cyberspace spills out into a computer-mediated reality? What will be the role of the government in regulating and setting policy for conduct in virtual communities or computer-mediated spaces, and what will be the role for the courts in interpreting and carrying out the law? Will the traditional roles and functions performed by governments and courts in real-world environments be extended to virtual communities? How will computer-mediated spaces be carved into the structures and space of the real world? More fundamentally, is there a mapping function that can be applied to mediate between these worlds?

With the recognition that existing property, contract, tort, and criminal law may wash across the dissolved boundaries of computer-mediated perception, a number of other questions arise. Should people be permitted to own a piece of virtual space? What about ownership of mediated real space—should a person be permitted to sell software that has the capability of passing off one registered trademark or brand name for another? Ought we to extend to those who choose to wear computer-mediated vision systems (integrated into their visual and cognitive feedback loops) the same legal protections that are afforded to persons who wear prosthetic devices to enhance what is perceived by some as a disability? And what liabili-
ties, if any, should be incurred by those who disrupt the functioning of a person’s computing prosthesis?

In addition to these questions about the interrelationship between the governance of real and cyber spaces, a plethora of other concrete legal, ethical, and policy questions emerge. For example, as we begin to interact more with virtual characters (or avatars), what status might they derive? Should a smart avatar working mostly independent of a human be afforded legal rights, such as the right to contract, or be liable for its errors, in the same way that humans or abstract entities such as corporations already enjoy such rights? (See the Forum paper by Woodrow Barfield, “Issues of Law for Software Agents within Virtual Environments.”) How might we prevent the use of such avatars as a means of acting immorally or breaking the law? (See the paper by Ian Kerr and Marcus Bornfreund, “Buddy Bots: How Turing’s Fast Friends are Undermining Consumer Privacy.”)

The above sets of questions and examples are timely. More and more, these issues are being canvassed by legal scholars, many of whom have already commenced discussions about the governance of virtual spaces. To date, these discussions are inconclusive. However, since governmental bodies are already actively developing law and policy with the aim of governing cyberspaces, it may not be long before such bodies may also see it within their province to begin the active process of codifying and creating policy for the full range of human activities occurring or expected to occur in virtual and computer-mediated communities.

In the context of virtual and mediated reality, emerging issues on law, policy, and ethics are relevant not only to lawyers, policy makers, and politicians, but also to those in the presence community, that is, those individuals who design the technology, write the software, and evaluate the usefulness of the technology for human tasks. (See the paper by Luciano Floridi, “The Philosophy of Presence: From Epistemic Failure to Successful Observation.”) Why should those who design the technology be concerned with legal, ethical and policy issues? (See the paper by Katharina-Maria Behr, Andreas Nosper, Christoph Klimmt, and Tilo Hartmann, “Some Practical Considerations of Ethical Issues in VR Research.”)

The following example illustrates the tensions between law, policy, and ethics in the context of virtual environments. While it may be technically possible to create a virtual avatar with the likeness of a current celebrity, using that image without the celebrity’s permission to garner trust or to sell products may be immoral. Further, the celebrity may have legal rights restricting the use of his or her image, such that using that person’s likeness in a virtual avatar would constitute a violation of the law (the tort of misappropriation of a person’s name or likeness). The designers of an avatar that exploits the celebrity’s image could be confronted by a lawsuit.

To date, much of the scholarship in the area of virtual and mediated reality has focused either on the actual design of the interface technology, or on experimental and survey studies aimed at showing whether this new range of interface technologies is actually beneficial to human users. As with any technology, once it reaches a critical stage of acceptance and design, it becomes important to ask questions about the social dimensions that accompany the use of that technology, including the scope of its permissible use.

As an illustrative example, consider a recent U.S. Supreme Court case in which the court was asked to determine whether a sexually explicit computer-generated image of a child (note that an actual child was not used to create the image) constituted “child pornography” (see Ashcroft v. Free Speech Coalition, 535 U.S. 234, 2002, in which the court held that the use of a computer-generated image did not constitute child pornography). The Ashcroft case provides a classic example of the difficulties that courts face in balancing an individual’s freedom of expression against its potential to harm others.

One of the central reasons for this special edition is to inspire the designers, programmers, and evaluators of virtual worlds not only to contribute to the law and policy dialogue, but also to play a prominent role in the discussions of what basic freedoms people in virtual and computer mediated environments should and should not have. Although many of those who design the technology may think themselves removed from these complicated and difficult questions, such is not the case. Those who design the tools of virtual and mediated reality should be concerned about its potential uses and abuses. The presence community must therefore think carefully not only about what the technology will allow us to accomplish in the field of virtual environments and mediated reality, but the social ramifications that accompany the allowed uses of such technologies.
The emerging legal, policy, and ethical issues seem to spread almost as quickly as the pervasiveness of the technologies themselves. In this special edition, we have tried to order this dialogue in terms of conceptual categories that reflect various research areas relevant to wearable computing, virtual environments, and computer-mediated realities. We have also tried to present what seem to us important issues in the near future, in terms of exploring, discovering, and suggesting the relationship of the design and use of virtual and computer mediated reality to what might be characterized as sociocultural design. There now exists a special window of opportunity, allowing the presence community to look deeply into our possible tomorrows and to have input into the new legal architectures that are being constructed to regulate virtual spaces. These legal and ethical architectures will no doubt affect the design and designers of these technologies, not to mention their visions of a desirable future. This special edition is meant to generate thoughtful discussion among those who design and evaluate these technologies on the important questions of why and when virtual and computer mediated environments should be integrated into society, and what basic freedoms should be enjoyed by participants within virtual and computer mediated communities.

About our Cover Image: The figure on the front cover represents the theme of the special section on legal, ethical, and policy issues associated with virtual environments and computer mediated reality. It was created by guest editor Steve Mann, and depicts a mannequin on the front lawn of the Supreme Court of Canada, wearing a computer system that includes computer-mediating eyeglasses. The picture suggests that the future design and use of virtual, wearable, and computer mediated reality technologies may not only be a function of what the technology will allow, but also what the State and its courts will allow through the application of its statutes, regulations, and case law.

The photo is a long-exposure picture running from approximately 8:09 P.M. to 10:03 P.M., and was created using another wearable computer system, in a computer-mediated reality. The eyeglasses depicted, and a similar pair worn to capture the picture, both consist of a computer-controlled laser light source that modifies the visual perception of reality.

There is an interesting metanarrative here: the type of apparatus depicted in the picture was in fact used to capture the picture, through a process of using light to modify the visible world. Computer mediated reality allows us to see the everyday world in a different light, blurring the distinction between the real and the virtual. Anecdotally, it turns out that even the process of taking this picture raised the specter of the uncertainty existing between physical and virtual worlds. One can imagine the stir that was created during the photo shoot, when a cyborg and his daughter and wife, a law professor, a cognitive scientist, and a world renowned cryptographer stood amid the plethora of surveillance cameras and security guards that surrounded the property of the Supreme Court of Canada while the sun set behind Parliament Hill.

We thank the Security Guards of the Supreme Court of Canada for permission to place the mannequin with its wearable devices on the front lawn (thereby preventing what would otherwise be a trespass). We also thank guest editor Ian Kerr for arranging such permission, and for suggesting that the cover image for the issue be taken at this inspiring location.

Guest Editors
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Steve Mann
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This special section is a new and somewhat unusual venture for Presence, and we realize that some of the issues raised in the papers may be controversial. We therefore want to encourage experts in the field to submit comments on the papers, in the form of articles or letters to the editor. In keeping with past practice, articles which form a part of this special section are indicated in the table of contents by an S.

—The Editors
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