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The arts, science, and technology are experiencing a period of profound change. Explosive challenges to the institutions and practices of engineering, art making, and scientific research raise urgent questions of ethics, craft, and care for the planet and its inhabitants. Unforeseen forms of beauty and understanding are possible, but so too are unexpected risks and threats. A newly global connectivity creates new arenas for interaction among science, art, and technology but also creates the preconditions for global crises. The Leonardo Book Series, published by the MIT Press, aims to consider these opportunities, changes, and challenges in books that are both timely and of enduring value.

Leonardo books provide a public forum for research and debate; they contribute to the archive of art-science-technology interactions; they contribute to understandings of emergent historical processes; and they point toward future practices in creativity, research, scholarship, and enterprise.
Leonardo, the International Society for the Arts, Sciences, and Technology, and the affiliated French organization Association Leonardo have two very simple goals:

1. to document and make known the work of artists, researchers, and scholars interested in the ways that the contemporary arts interact with science and technology and
2. to create a forum and meeting places where artists, scientists, and engineers can meet, exchange ideas, and, where appropriate, collaborate.

When the journal Leonardo was started some forty years ago, these creative disciplines existed in segregated institutional and social networks, a situation dramatized at that time by the “Two Cultures” debates initiated by C.P. Snow. Today we live in a different time of cross-disciplinary ferment, collaboration, and intellectual confrontation enabled by new hybrid organizations, new funding sponsors, and the shared tools of computers and the Internet. Above all, new generations of artist-researchers and researcher-artists are now at work individually and in collaborative teams bridging the art, science, and technology disciplines. Perhaps in our lifetime we will see the emergence of “new Leonardos,” creative individuals or teams that will not only develop a meaningful art for our times but also drive new agendas in science and stimulate technological innovation that addresses contemporary human needs.

For more information on the activities of the Leonardo organizations and networks, please visit our Web sites at <http://www.leonardo.info/> and <http://www.olats.org >.

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Chair, Leonardo/ISAST

This book draws together three areas: live performance, digital technologies, and the philosophical practice of phenomenology. It offers the reflections of someone trained in dance and philosophy on a range of technologies, from fairly low-tech to more sophisticated systems. Physical interfaces, embodied philosophies, sensory engagement with the world and with others, embodied imagination, the politics of bodies reflected through cities, and even the act of writing: at the center of it all are bodies.

Yet this is not a book by a dancer about dance, by a philosopher about philosophy, or simply a chronicle of the ever-expanding array of interactive systems and devices for artistic, social, or physical computing. It is about what can be discovered and created as we become closer to our computers and closer to others through them, when they become extensions of our way of thinking, moving, and touching. This book does not just offer an analysis or a critique; at the heart of it is a method for how to discover, create, and listen as we become...
closer to our technologies.

Echoing the worn wisdom that art reveals life, the premise of this book is that the dance or performance studio is a hothouse for understanding wider social engagements with technologies. In the cases of the projects explained in the chapters of this book, the so-called dance studio was usually a lab, but occasionally a kitchen, a hotel room, a gallery, or simply a corner in which were crammed at least one body and at least one computer, plus usually an Internet connection and a sensing device sometimes as basic as a webcam. The simple point to be made is that the body of the dancer is the site of discovery, and what is discovered may shed light beyond the seemingly arcane space of the studio. The act of performing in responsive systems acts also, with appropriate strategies for reflection, as a catalyst for understanding how human beings encounter themselves and others through computers. It reveals the potential for both beauty and abjection when bodies and computers become closer.

Yet there is still more to this argument than asserting that the performative moment is a condensed moment of everyday usage.

What is revealed through the phenomenological reflections offered in this book is that potentially dense or difficult concepts can be demystified and given a sort of intuitive fluidity once they are read through the body. Perhaps these are just modest glimpses of otherwise abstract or incomprehensible concepts—that our relations with the world and people are reversible, that the invisible is the lining of the visible, or that our digital data prompts us to reevaluate our views of ethics—but by being understood on a corporeal level the impact might just be lasting and have a transformative effect, subtle or great, on how we engage with our computational systems and with each other. This book relies heavily on the writings of French phenomenologist Maurice Merleau-Ponty (1908–1961), a philosopher who has been neglected by most but is beginning to infiltrate philosophical discussions. Merleau-Ponty was never given the public attention accorded to Jean-Paul Sartre, Emmanuel Levinas, or Jacques Derrida. There is speculation as to whether this may be because of his retiring personality and his political rift with Sartre in the 1940s, because he died leaving his major body of work incomplete, or because his thought is too complex. Dermot Moran credits him with shunning clarity in the attempt to write and live the poetry of the chiasm, but at the same time producing undoubtedly “the most detailed example of the manner in which phenomenology can interact with the sciences and the arts,” and a potent description of the human body in the world. (2000; 430–434) It is my contention that being able to describe the human body in the world, particularly as the world changes dramatically and rapidly with the proliferation and dissemination of technologies of all sorts (from smart wars to internet shopping to genetic engineering) can’t help but be a useful skill.

As a method, phenomenology involves a return to lived experience, a listening to the
to the senses and insights that arrive obliquely, unbidden, in the midst of movement experiments or quite simply in the midst of life. Phenomenology, in short, allows me to respect these sensations and inner voices, these unformed ideas, thoughts, or images that emerge directly from the experience of being in computational systems like telematics, motion capture, or networked wearable computing. Bodies are more than just meat; they are sources of intelligence, compassion, and extraordinary creativity. In some respects this book comes from a personal, creative place: I needed a methodology to allow for a passion for philosophical concepts from the wider world to converge with innately philosophical concepts, and even critiques, that were embedded in my body and surfaced through movement. I needed a methodology that not only would respect my highly subjective experiences, but also might provide a dynamics for revealing broader cultural assumptions and practices, for acknowledging the reality that all bodies exist with and through other bodies in social and political contexts. And I needed a methodology that operated through resonance rather than truth. Over more than ten years I developed my own methodology based on these professional artistic needs, and this is what I offer in the pages to follow. I have a sense that this is a good time for a reworking of phenomenology, that the examples of phenomenologies presented here might be meaningful not only for the concepts they reveal but also for the method that is deployed. Perhaps my extrapolation of the phenomenology of Merleau-Ponty will be of interest, or even a provocation. Strong sentiments are appreciated: outrage, excitement, epiphany, confusion, fear, or pleasure. I like to think that this book might inspire others to attempt their own phenomenologies. Philosophy is, if anything, an emergent field, but one that just happens to be thousands of years old.

This book’s phenomenology of closeness between bodies and computers aims to satisfy a few pragmatic goals. First, within an academic context it can be seen to fill a gap in scholarship and in broader cultural discourse around digital technologies. The combination of performance and phenomenology yields entwinements between experience and reflection that may shed light on, problematize, or restructure scholarly approaches toward human bodies using digital technologies. Next, in a broader discursive context that includes cultural practice and attitudes not confined to academia, it seems that there continues to be a sense that computers and virtual technologies of all kinds engineer a duality between human and computer, material and immaterial, analogue and digital, organic and inorganic, and body and mind, with the body side of things coming out the worse for wear. At the end of the 1990s I hoped that I would no longer have to maintain a public profile as a member of what I wryly referred to as “the body police,” one of a group of voices to call repeatedly for attention to be paid to the presence of the body in our computer systems, be these ambient, responsive, or virtual. I hoped that the era of celebrating the seduction and abandonment of the body by and within virtual reality was over. Unfortunately, flesh still struggles in the face of the machine, or oozes onto
it, as these constructions of materiality continue to taunt one another. This book argues for more than an integration of the body-machine duality, more than a creation of a continuum or spectrum with body at one end and mind at the other, but takes an immanentist approach to each of the dualities listed earlier as enfoldings or entwinements. As will be clear from the many citations across the chapters of this book, I am, happily, not alone in this venture. Finally, and from a design perspective, a hope exists that either these reflections, or those by others that may follow in this same vein, may have some impact on the design and use of our next generation of computational devices and systems. Every stage of human development, mechanical, intellectual, physical, or spiritual, can only benefit from a better understanding of “who ‘we’ are, who ‘we’ have been, and of who ‘we’ might come to be” and above all that things might be otherwise (Critchley 2002b, 87). A belief in the transformative potential of the extraordinary alchemy between bodies and technologies is the foundation of this book.

Each chapter is devoted to explaining a set of philosophical concepts embedded in the performative experience of particular configurations of technologies. The chapters are phenomenologies, and they contain phenomenologies: layers of reflection are enfolded in each chapter, and some passages directly describe sensations of being in a particular system, while others are devoted to extrapolating these through the philosophical concepts of a range of thinkers. It seemed essential to provide a substantial chapter to ground and contextualize the chapters devoted to performances. This is the role of chapter 1. It outlines the approach to phenomenology that I have developed over the years—the concepts, context, and rationale, as well as kindred thinkers. Ambitiously, I offer a practical methodology to follow in order to answer that most practical of questions: “But how do I do a phenomenology?” As chapter 1 draws to a close, sections are devoted to clarifying the key concepts of performance, technologies, and virtuality. Words that we hear all the time, words that seem to fade into the white noise of our cultural life, are first exposed as polysemic, then carefully interpreted and released, becoming embedded in the reflections of the following chapters. Chapters 2, 3, 4, and 5 are written in a chiasmic form: this is to say that there is as much of an emphasis on performances with technologies as there is on the thought that emerged from the performances. This corresponds to the Merleau-Pontian chiasm by being an overlapping and entwining dynamic between concepts and the lived moment of doing, between reflection and experience. Of course, this is a book and not a live event, interactive DVD, or game, so there is a bias toward linear presentation of ideas in a conceptual and linguistic form; still, the flexibility of language is pushed at times in order to yield as much of a sense of “being there” as possible, without dissolving scholarly prose into poetry or claiming that the writing of the event can replace the live event itself.

Chapter 2 presents the notion of...
extended bodies through several telematic performances that took place mainly in the 1990s. The technologies of the era are respected, as are the reflections they evoked. This chapter brings to the surface ideas that will be elaborated in later chapters, such as flesh, networked space, and reversibility. It also critiques an idealist notion of telepresence and online interaction by providing a materialist account of space and virtually. Complementing reflections on four performances is a phenomenology based on a pedagogic experiment. This is the only section to address directly potential educational uses of online technologies, despite the fact that many of the performances in this book had workshops integrated into their devising or touring phases.

Chapter 3 offers a poetics of responsivity based on Merleau-Ponty’s dynamic of reversibility. Only two projects are addressed: Plaatsbepaling, through which reflections on time and the body emerge, and the responsive installation trajets. With these projects, not only is the locus of performance distributed across organic and inorganic structures of varying degrees of materiality, but also the complexity of experiential voice and perspective is set into play. The discussion of trajets begins with a first-person phenomenology and ends with an ecosystemic approach; this journey is facilitated by a transition from Merleau-Ponty’s idea of flesh into Deleuze’s construction of metabolism. Both projects are examples of responsive architectures converging with performance from which two genres emerge: the performative installation and the participatory installation.

Chapter 4 considers notions of intersubjectivity and otherness through performative experiments with motion capture. The technologies range from older motion capture (mocap) systems to tenuous hacked-together constructions to more sophisticated and expensive configurations. Each of the systems used in the performances and installations in this book offers challenges for understanding human bodies and social embeddedness, making clear that our existing metaphors, structures, and conventional knowledge frequently are not capable of explaining these shifting alchemies of bodies and computers. This is particularly true with the last two chapters, and for this reason the question of ethical relationships between ourselves and others, ourselves and our digital representations of ourselves and our digital representations of others becomes relevant. Emanuel Levinas is called upon to develop an understanding of otherness, and Deleuze’s interpretation of Spinoza’s ethics is used to problematize and deepen the discussion. In short, this chapter poses the question of whether we can have ethical relationships with digital data, whether a human ethics can be developed from human-digital interactions. A version of embodied ethics from the continental philosophical tradition as opposed to applied moral philosophy is used to reflect upon this question.
Finally, chapter 5 takes the momentum toward closeness and dissolving the barrier between bodies and technologies one step further by considering Merleau-Ponty’s notion of the flesh in the context of wearable computing—in particular, the whisper[s] project. A distinction is drawn between wearables and bio art, while at the same time the metaphor and physical reality of human connective tissue is expanded to account for “data choreography” across bodies and mobile wireless networked devices. With wearables we can connect with ourselves, with another, or with a wider group of people. This poses the question of whether they fall into the domain of locative media and invites debate from geographers as well as locative media artists and designers. At the end of the chapter, a construction of the abject as it applies to wearable computing is offered.

I understand, on a visceral level, the words of writer and playwright Hélène Cixous when she says, “One can die from being unable to write in time the book one has in one’s body. This is the book that must be braved, it demands of me a courage I desperately seek to call up in myself” (1998, 17). I do not think of myself as particularly courageous, but I can speak to the discomfort that arises as thoughts well up in a body. Like moving beings, there is a need for them to be released, to escape into the air and the sunlight. I hope the timing is right and these words find resonance within immanent spaces in the bodies of readers, perhaps even fostering new phenomenologies.
I would like first to acknowledge the artists I have worked with over the years. Their creativity, intelligence, sense of humor, and incredible hard work shaped the collaborative projects that animate the pages of this book. Each person has left a trace in the pages to follow, from those who brought trajectories to life: Gretchen Schiller, Robb Lovell, Pablo Mochcovsky, Scott Wilson, Jonny Clark, Shaun Roth and Kari Kimura (“the marges”); to those who let bodies whisper: Thecia Schiphorst, Sang Mah, Gretchen Elsener, Kristina Andersen, Camille Baker, Jan Erkku; to those whose movement was captured and visualized: Jamie Griffiths, Helen Terry, Tara Cheyenne Friedenberg. Robb Lovell gets special recognition for being the thread across so many projects. Appreciation goes to Lone Koefoed Hansen for demonstrating the richness of “the placebo,” and to Lizbeth Goodman for never losing faith that the world can be made a better place through art, ideas, and words. I am ever so grateful to Rebeca Mendez and Adam Eeuwens for agreeing to design this book out of a vision of how ideas and move-
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