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Contents

Preface

"We hope this finds you well during these difficult and uncertain times."

The nature of writing about uncertainty is that it is an uncertain pursuit. I had no idea when I would get the perspective needed to write something external. Any sense of urgency to share material had given way to a concern with survival and a reassessment of priorities. And the material I had seemed old and tired now that a new crisis had come. Maybe it is more important that I spend my time helping people on my street rather than pontificating on uncertain futures, I wondered. If there is no business as usual, what should we make together and in what arenas?

So, "normality" and "certainty" were casualties and it is salutary to be forced to think what this means in one's own life rather than just theorizing about it in a workshop, as I did at the start of lockdown, or in a book. During the pandemic and its aftermath, my world shrank and all my old usual things, like travel, eating out and theatre, disappeared from my life and a new wave of things came in. But what does it take to qualify for that familiarity, that frequency of occurrence? To be usual? When does a life lived differently tip from "rare" and "special" to normal?

> If we answer that, we commit to a new way of thinking
> about our lives. We accept that we can change fast and flex
> often. If my usual is now the tiny world of my Zoom account
> and a few rooms, on what scale are we judging our lives
> now? What has happened to our temporalities? Who am I?
> (Light, notes, March 2020)

Though we didn't plan it this way, this monograph was produced at a
time when uncertainty seemed to be at the forefront of everyone's minds
(and in the "hope you are well" salutations of our emails). The rapid
succession of lockdowns, conflicting public health guidance, and frenzied
attempts to understand COVID-19 that so many of us experienced
during the early days of the pandemic gave way to a prolonged, grinding,
succession of losses. We fervently tracked infection rates, death counts,
and, more recently, vaccination numbers, knowing these data didn't
begin to describe the world we were living through. The urge to grab
hold of something firm during such moments is a powerful one, but, as
we will argue, not the only option available to us. COVID-19 will not
be the last crisis, and perhaps not even the last pandemic, of the early
21st century. Expanding our set of tools for navigating and thinking
with and about uncertainty will therefore be a necessary undertaking,
in our personal and scholarly lives alike.

Modes of Uncertainty in HCI

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ABSTRACT

This monograph examines how HCI conceptualizes, situates, and responds to uncertainty—particularly arguing that our ability to respond to such uncertainties is governed to a great extent by the concepts we use to enframe a single, encompassing, overburdened and slippery idea. We propose four distinct "modes of uncertainty" as a means to begin to draw together the varied strands of work in HCI that address uncertainty in its many forms. The first, and most common, mode is to treat uncertainty as something in need of taming or disciplining. The second mode is to treat uncertainty as generative, or as a resource that can assist in human practices. The third is to look to the politics that shape how we encounter uncertainties and the fourth mode attends to the lived experience of uncertainty through affective dimension.

Rather than focus on uncertainty as a discrete phenomenon in the world to be studied, we look to how research goals, methods, and theoretical frames used in HCI research influence the various ways in which we encounter it. By switching from uncertainty (noun) to modes of engaging uncertainty

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(verb), we foreground uncertainty as a relational concept. We show that it is an active and ongoing condition that designers and researchers make present in different fashions depending upon their priorities and the context in which they are working. We will show that adding modes of uncertainty to our conceptual toolbox facilitates conversation between domains as diverse as disaster risk, maternal health, cyber-security, and community organizing and lets us draw new connections between disparate areas of research including visualization studies, critical design, feminist epistemologies, and sustainability.

1

Introduction

Uncertainty is a prevalent characteristic of contemporary life and a
central challenge of HCI. As humans, researchers, and designers we
encounter uncertainty in a multitude of forms and a variety of settings.
Many of our field sites and critical research areas, from big data to
crisis informatics and sustainable HCI, or politics, health, cybersecurity,
and cross-cultural dialogue are settings characterized by high degrees of
uncertainty. The growing attention to uncertainty in HCI is due, in part,
to the ever increasing expansion of the field and questions and contexts
to which we seek to apply HCI research and practice. But events in
the world – a global pandemic, climate change, political turmoil, the
increased economic upheaval faced by many professions – are also forcing
us to engage more directly with questions related to uncertainty. Apace
with, or perhaps in response to these changes, society is turning more
than ever to data as a means to enable or mediate our understanding of
these phenomena, the episteme of which is fundamentally characterized
by questions of probability, margin of error, standard deviation, and p-
values, each of which is fundamentally about circumscribing or managing
uncertainty.

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This monograph examines how HCI conceptualizes, situates, and responds to uncertainty-particularly arguing that our ability to respond to such uncertainties is governed to a great extent by the concepts we use to enframe a single, encompassing, overburdened and slippery idea. HCI in fact has had quite a bit to say on the topic over its history. Indeed, design research methods have often been portrayed as tools for coping with uncertainty in product development processes. Elsewhere in the field, colleagues have investigated effective means for visualizing uncertainty, explored the benefits of ambiguity to user appropriation, or critiqued the precarity imposed upon workers in the so-called "sharing economy." Despite the myriad and diverse appearances of uncertainty in HCI, we don't currently possess the necessary conceptual apparatus to bring these varied studies into conversation. As a result, we often end up talking past each other when we might otherwise be collaborating.

In what follows, we propose four distinct "modes of uncertainty" as a means to begin to draw together the varied strands of work in HCI that address uncertainty in its many forms. The first, and most common mode is to treat uncertainty as something in need of taming or disciplining. Here, uncertainty is often encountered as a problem. This is perhaps unsurprising given our field's close connections to computer science and engineering. Western science has traditionally formulated uncertainty as problematic, or something to be overcome through progressive advances in science and philosophy. Indeed for many scholars, an asymptotic pursuit of certainty is in fact one of the defining characteristics of Modernity (Toulmin, 1992). Despite the ways in which quantum physics has complicated the issue and increased attention to so-called "wicked problems" or "post-normal" science, the disciplining perspective continues to motivate much of HCI research on uncertainty. In contrast, a second mode is to treat uncertainty as generative, or as a resource that can assist in human practices. Here uncertainty is both inevitable and, if artfully deployed, a resource for the design of artifacts and systems. A third mode of uncertainty is to look to the politics that shape how we encounter uncertainties. Finally, the fourth mode attends to the lived experience of uncertainty through affective dimensions.

The word *mode* comes from the Latin word for "method", and for our purposes designates a particular approach, or relationship toward uncertainty.[1] Rather than focus on uncertainty as a discrete phenomenon in the world to be studied, we instead look to how research goals, methods, and theoretical frames used in HCI research influence the various ways in which we encounter it. By switching from uncertainty (noun) to modes of engaging uncertainty (verb), we foreground uncertainty as a relational concept. We show that it is an active and ongoing condition that designers and researchers make present in different fashions depending upon their priorities and the context in which they are working. We will show that adding modes of uncertainty to our conceptual toolbox facilitates conversation between domains as diverse as disaster risk, maternal health, cybersecurity and community organizing and lets us draw new connections between disparate areas of research including visualization studies, critical design, feminist epistemologies, and sustainability.

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[1]Well into this project, a friend recommended the edited volume *Modes of Uncertainty* by anthropologists Samimian-Darash and Rabinow (2015). Though we found the book an interesting and important contribution, our project and thus our use of the concept of "modes" is quite different.

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