

EMOTIONAL AI

The Rise of Empathic Media

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INTRODUCING EMPATHIC MEDIA

Emotions matter. They are at the core of human experience, shape our lives in the profoundest of ways and help us decide what is worthy of our attention. The idea behind this book is to explore what happens when media technologies are able to interpret feelings, emotions, moods, attention and intention in private and public places. I argue this equates to a technological form of empathy. As we will see, there are many personal and organisational drivers for using technologies to understand how individuals and groups of people feel and see things. These include making technologies easier to use, evolving services, creating new forms of entertainment, giving pleasure, finding novel modes of expression, enhancing communication, cultivating health, enabling education, improving policing, heightening surveillance, managing workplaces, understanding experience and influencing people. This is done through ‘capturing’ emotions. In computer science parlance ‘capture’ simply means causing data to be stored in a computer, but ‘capture’ of course has another meaning: taking possession by force. This book is in many ways an account of the difference between these two understandings.

Overall I suggest that we are witnessing a growing interest in mediated emotional life and that neither the positive or negative dimensions of this have been properly explored. This situation is becoming more pressing as society generates more information about emotions, intentions and attitudes. As a minimum, there is the popularity of animojis, emojis and emoticons on social media. These facilitate non-verbal shorthand communication, but they also allow services insight into how content, brands, advertising campaigns, products and profiles make people feel. The vernacular of emoticons increasingly applies both online and offline, as we are asked for feedback about our perspectives, how we are and what’s happening. The emotionalising of modern mediated life is not just about smileys, however. Rather, the sharing of updates, selfies and point-of-view content provides valuable understanding of life moments, our perspectives and individual and collective emotions.

Interest in feelings, emotions, moods, perspectives and intentions is diverse. Political organisations and brands trace how we feel about given messages, policies, candidates and brand activity through online sentiment analysis. Similarly,

advertising agencies, marketers and retailers internally research what we say, post, listen to, our facial expressions, brain behaviour, heart rate and other bodily responses to gauge reactions to products, brands and adverts. Increasingly, digital assistants in the home and on our phones are progressing to understand not just what we say, but how we say it. In terms of affective media experience, virtual reality has raised the bar in unexpected ways. As well as generating emotional responses that can be measured, this also tells analysts a great deal about what captures our attention. Augmented reality promises something similar, albeit in public and commercial spaces. Wearables attached to our bodies track all sorts of biofeedback to understand emotions and how we feel over short and extended periods of time. As we will see, this potential is being applied in novel, surprising and perhaps alarming ways. Indeed, some of us even insert ‘technologies that feel’ into our bodies to enhance our sex life. At a macro-level, cities are registering the emotional lives of inhabitants and visitors. This book assesses all of these phenomena, and more.

I call for critical attention and caution in the rollout of these technologies, but I should state upfront that I do not think there is anything innately wrong with technologies that detect, learn and interact with emotions. Rather, the practice of reading and detecting emotions is a step forward in improving how we interact with machines and how they respond to us. For example, as will be explored, games are enhanced through use of biofeedback and information about how we feel. The issue is not the premise of using data about emotions to interact with technology, but the nature of engagement. In short, while all might enjoy and appreciate the focus on ‘experience’ (user, consumer, patient and citizen), it is paramount that people have meaningful choice and control over the ‘capturing’ of information about emotions and their bodies.

This book was researched and written during an interesting period. I have been writing about moods and technology since 2009 (McStay, 2011) and introduced the principle of *empathic media* in another book (McStay, 2014). This refers to the capacity for emergent media technologies to sense and discern what is significant for people, categorise behaviour into named emotions, act on emotional states, and make use of people’s intentions and expressions. With financial assistance from the UK’s Arts and Humanities Research Council from mid-2014 through to the end of 2016 I began researching and interviewing high-value individuals developing and employing emotion-sensitive technologies. Over the course of the research period the technology sector has begun to address emotions and affective computing in a much more serious fashion. When I first started interviewing it was largely start-ups finding commercial opportunities in technologies sensitive to emotional life. As the project progressed, I found that more recognisable names such as Amazon, Apple, Facebook, Google, IBM and Microsoft are now publicly developing emotional AI and empathic media products. Many of the original start-ups I spoke with are now looking forward to lucrative exits.

Technologically, the rise of interest in emotional life is indivisible from the increase in applications of artificial intelligence (AI) and machine-learning methods. While we are undergoing a hype cycle that brings with it inflated expectations, this should not detract from the fact that these technologies are here to stay. Of course, they will also improve. Indeed, in as far as AI systems interact with people, one might reason that AI has no value until it is sensitive to feelings, emotions and intention. This includes home assistants and headline grabbing humanoid robots, but the important development is how emotion recognition systems are progressively permeating human–computer interactions. If the reader agrees there is personal, inter-personal, organisational, economic and surveillance value in understanding emotional engagement with self, others, objects, services and content, emotional AI and empathic media are worth our attention.

Artificial emotional intelligence is achieved by the capacity to see, read, listen, feel, classify and learn about emotional life. Slightly more detailed, this involves reading words and images, seeing and sensing facial expressions, gaze direction, gestures and voice. It also encompasses machines feeling our heart rate, body temperature, respiration and the electrical properties of our skin, among other bodily behaviours. Together, bodies and emotions have become machine-readable. What I am *not* arguing is that these systems *experience* emotions. Instead, I am interested in the idea that the capacity to sense, classify behaviour and respond appropriately offers the *appearance of understanding*. I suggest this form of observation involves a form of empathy. To develop the thesis that media and technologies are progressively showing signs of empathy, I begin with two propositions:

1. We increasingly ‘live with’ technologies that feel and these are sensitive to human life in ways hitherto not seen.
2. Empathic media provide opportunities for new aesthetic experiences that not only draw upon information about emotions, but also provide new means for people to ‘feel into’ aesthetic creations.

If the reader agrees that technologies are increasingly capable of gauging emotional behaviour and that there is personal, inter-personal, commercial and other organisational value in understanding emotions, we should agree that ‘datafication’ (Mayer-Schönberger and Cukier, 2013) of emotional life is unavoidable. Deconstructed, proposition 1 suggests that: a) technologies that make use of data about emotions are increasing; b) we live alongside technologies such as digital assistants rather than simply ‘use’ them; and c) we will encounter these technologies in unexpected places (such as shops). Proposition 2 is based on the simple fact that new media technologies offer content creators new affordances. Although much of this book addresses the scope and implications of emotion tracking, the principle of empathic media encompasses applications that allow people to viscerally understand places, periods, cultures, objects and real and fictional worlds.

Good Enough: Verisimilitude and Emotional Truth

One or all three of the following questions might be in the reader's mind: first, 'are machines *really* capable of empathy ... isn't this a bit of a stretch'; followed by, 'isn't this a very limited view of emotions'; and lastly, 'what about compassion and sympathy in empathy?' The last question is most easily dealt with. Although we typically connect empathy with sympathy and compassion, the connection is not a necessary one. To interpret an emotional state and make predictions about a person's perspective and disposition does not require that we want the best for that person. Sympathy is not a necessary criterion for empathy, but instead empathy is simply an interpretive act. Cognitive empathy, which may entail sadism and mental as well as physical cruelty, is a brutal example of this.

This is a 'theory-theory' approach to empathy, where emotion is theorised through observation (Goldman, 2008). Put otherwise, it is to understand another person's condition by means of what we survey, measure and remember as well as what rules are made for subsequent engagement. This neo-behaviourist approach means that systems sense, discern patterns of behaviour, make judgements by means of algorithms and heuristics (if person A is behaving in X manner then do Z), provide content and feedback and learn from people's reactions. What is key here is that empathic media systems do not employ 'mentalist' processes. Instead they 'simply' observe, classify, allocate, adapt and modify their behaviour.

Accordingly, it is reasonable to say that computers can recognise emotions when 'the group of computers and the group of humans respond with the same distribution of answers' (Picard, 1997: 51). Imbued within this is recognition that people do not judge correctly each time, and nor should we expect machines to either. This is a simple but important point. If we are to critique machines and say they do not have access to our 'authentic emotional states' (whatever this may denote), it cannot be because they misdiagnose and sometimes read people incorrectly.

On whether this is a limited view of emotions, it is not clear what emotions are. Empathic media employ a particular account of what emotions are through their use of psychological, anthropological and neuroscientific research, largely deriving from Paul Ekman and his forerunners. As we will see, there is an attractive simplicity to 'basic emotions' (Ekman and Friesen, 1971) that technologists have latched onto. To an extent this is because of expediency and that this account of emotional life works well with sensing techniques that classify facial and bodily behaviour. Indeed in a telling line from early proponents of emotion-sensing technology, they say, 'Choosing a physiological or behavioural measure can be relatively easy, in that technology or methodology will often dictate a clear preference' (Bradley and Lang, 1994: 49). The 'basic emotions' view contrasts with the messier idea that emotions might not be fixed objects, but culturally constructed experiences and expressions defined through historical and situational circumstances.

On whether machines can really understand us, we have two possibilities: a) *genuine empathy* (which is the capacity to truly know what another is undergoing); and b) *simulated empathy* (the capacity to approximate, to contextualise within what one can comprehend, to make educated judgments and to respond in an appropriate manner). Much of this has been rehearsed in debates about whether machines can really think, what it is for a person to think and the philosophical knots associated with knowing the lives of others. Yet, if we allow for the possibility of a simulated and observational version of empathy, the door is very much open for machinic empathy.

This has less to do with authenticity and more with what I have termed elsewhere ‘machinic verisimilitude’ or the appearance of intimate insight (McStay, 2014). It allows us to elide the debate of true versus false because a simulated and theory-based form of empathy may be tested on the basis of appropriateness of feedback. As such, we do not have to engage with the question of whether people have privileged access to a *real* understanding of emotions and intentions. Rather, we can simply judge by effectiveness. Of course, people clearly have the upper hand in instinctively reading and perceiving the significance of events for other people. However, machines have strong cards of their own because they can record, remember and interpret detail that is inaccessible to human senses (such as physiology). In fact, under closer inspection, perhaps the real question is not ‘can machines empathise?’ but ‘is machinic empathy that different from human empathy?’ I propose that it is reasonable to say that empathy is an interpretive act for people and machines involving observation, identification, contextualisation, learning and fast reactions.

Aims and Methods

My goal is to explore life with technologies that are sensitive to emotions, assess their political and social implications, and consider the ethical, legal and regulatory consequences. I do this by balancing empirical observations with insights from three sets of literatures: media and critical theory; science and technology studies (STS); and the works of a diverse range of philosophers. While the first two sets of literatures are fairly obvious starting points for a book on the phenomenon of empathic media, my recourse to the philosophical literature perhaps needs some explication. In short, the philosophers I have consulted help unpack the social and experiential significance of empathy. Often those selected have phenomenological interests (such as Husserl, Merleau-Ponty and Heidegger), but others such as Lipps, Scheler, Hume, Bentham and Adam Smith help situate the discussion of ‘feeling-into’. Foucault also assists through his insistence that knowledge should be tested in relation to the context and interests that generated it.

My main corpus of data comes from over 100 open-ended one-hour interviews conducted to elucidate views on emotion detection. These draw from industry,

national security, law, policy, municipal authorities and privacy-oriented NGOs (for a list of these organisations, see Appendix 1). Although many interviews do not explicitly feature in the book, each has implicitly shaped my thinking. In-person interviews primarily took place in Europe, the United States and the United Arab Emirates, but they also included face-to-face Skype calls with companies from Israel, Russia and South Korea. The scale of companies ranged from Alphabet (Verily), Facebook and IBM to start-ups by students.

Interview questions were co-created with key stakeholders from: the UK's Information Commissioner's Office (a data protection regulator) who were interested in implications for data protection; the advertising agency M&C Saatchi who were interested in creative opportunities; the UK's Committee of Advertising Practice (a self-regulatory body) who were concerned about protecting the reputation of the advertising industry; and the NGO Privacy International who were interested in meaningful consent, data ethics and data security. Interviewees were mostly chief executive officers (CEOs) and people in strategic positions from companies working on: sentiment analysis; virtual and augmented reality; facial coding; voice analytics; social networking; the emotion-enhanced Internet of Things (IoT); emotion-enhanced smart cities; and a wide range of companies developing wearables that track users' moods through respiration, electroencephalograms (EEG), heart rates and galvanic skin responses (GSR). End-user sectors include: advertising; policing; national security; education; insurance; human resources; the sex-tech industry; psychosexual therapy; experiential marketing; mental health; branding agencies; media agencies; ethical hackers; venture capitalists; artists; interactive film-makers; games companies; in-car experience and navigation companies; and sports software companies.

Each interviewee was selected on the basis of current work in emotion detection, or likelihood of interest in these applications. In addition to industrialists and public sector actors, I interviewed people working in privacy-friendly NGOs (Electronic Frontier Foundation, Open Rights Group and several staff members from Privacy International) to obtain a critical perspective. I also met with media and technology law firms to discuss the legal dimension of these developments, and European policy-makers in the field of data privacy to ascertain their awareness of the topic. A multi-tiered consent form was employed that allowed interviewees to select a level of disclosure they were comfortable with. Options ranged from willingness to speak in a named capacity on behalf of an organisation, to full anonymity.

Other research tools include a workshop with industrialists, regulators, NGOs and academics to develop codes of conduct for using data about emotions (discussed in Chapter 12). I also conducted a demographically representative UK nationwide online survey (n=2067). This assessed citizen attitudes to the potential of emotion detection employed in contexts they are familiar with.¹ (I will discuss this where relevant but see Appendix 2 for the overview.) Approaches also include

analysis of patent filings, which affords critical media scholars insight into the objectives, hopes, technical intentions, and worldviews of companies and owners. Similarly, textual analysis of product packaging and promotional content also reveals assumptions about ideal users and the ideological outlooks of organisations.

Chapter Breakdown

The arc of the book begins with a theoretical, historical, philosophical and technological framing in Chapter 2. Clarifying principles that will recur in this book, it identifies that empathy is a social fact of living in groups. It also addresses the industrialisation of emotions by noting not only that ‘emotion’ is a surprisingly recent psychological premise, that emotions are economically valuable, but also how emotional life is undergoing ‘biomedicalisation’ due to applications of emotional AI and affective computing. Although the book’s emphasis on machine-readable emotions may appear somewhat novel, the roots are relatively old. Technological antecedents reach back to the 1800s. The chapter accounts for these, the debates that surrounded them and their significance for my own case study of modern empathic media.

Chapter 3 addresses collective emotions by considering sentiment analysis. Unlike later chapters, this does not entail reading physiology to gauge emotion. Rather, it involves assessing what people say on social media. While usually text-based, it may also encompass emojis, images, video, user profiling and charting contact networks. I argue that what we are witnessing today is the entry of machines into public life that detect, map and interact with social emotion. However, online public life and collective emotions are not straightforward propositions. They are structured, mediated and influenced by a variety of human and non-human actors. To explore these I consider contagion, algorithms that drive issues up and down the social agenda, metering and modelling of voter emotions and software scripts (bots) that appear as people. Drawing on interviews with people from social media companies, sentiment analysts, marketers and government intelligence agencies, the chapter assesses ‘social listening’ in the context of case studies from political life, marketing, the financial sector and policing.

Chapter 4 begins an interest in biofeedback as a means to gauge emotion. Drawing on interviews with game developers and player experience analysts, it focuses on gaming because it has experimented with biofeedback since the 1980s. Gaming was also the first to learn lessons about the difficulties of using biofeedback data in a media and entertainment context. The principle that gaming illustrates is how the spectrum of channels through which we interact with media technologies is increasing. In addition to sensing bodies as a means to measure and interact with a person’s emotions, gaming illustrates the aesthetic argument of empathic media in that games are designed in such a way that we ‘feel-into’ content in novel and powerful ways. It is also the format that best exemplifies that

biometrics in media need not be ‘creepy’, but rather that it can benefit and enhance experience. However, the gaming community was also vocal about the need for data protection and privacy. This chapter ends by discussing these issues in relation to data from the nationwide survey I conducted where I asked UK citizens how they feel about biometric data and gaming.

After sentiment analysis, facial coding of emotions is perhaps the leading application of empathic media. Chapter 5 draws on interviews with facial coding firms that apply computer vision and machine-learning technologies to read facial expressions. While some readers will be familiar with its use in neuromarketing and ad-testing, it is in the less obvious applications where it becomes significant. This includes social media companies gauging responses to content, in-car behaviour, retail, and even analysis of performance in legal depositions. Conceptually, these methods, technologies and applications articulate emotional life in terms of ‘universalised leaks’. As such, in addition to assessing technologies and applications, I focus on method. I do this because the research context that underpins facial coding is the clearest enunciation of what emotional life is according to proponents of empathic media. This worldview stands in contrast to social and constructivist accounts of emotional life.

Chapter 6 considers the rise of voice-first empathic media that do not just analyse what we say, but how we say it. Drawing on interviews with voice analytics companies, it accounts for how voice-based emotion-capture *primes* systems employed by a range of sectors to respond appropriately to us. The significance of this is clearer if we consider the potential to understand and react to emotions in spoken search and natural language by chatbots and digital assistants, such as Amazon’s Alexa. This is an emergent issue and as home AI gets to know people and their life contexts better, emotion capture will provide cues to tell systems to respond appropriately. This raises questions about relationships, temporality and experience. While this may appear unnecessarily philosophical, consider that modern business is keenly interested in ‘moments’. As digital assistants feel-into our life, engage with intimate life moments, an ontological dimension is revealed. This might be the everyday act of chopping vegetables, following recipes and listening to guilty mood-uplifting pleasures on Spotify, provided by Alexa. These captured moments are economically valuable. As agents we ‘live with’, the remit of emotional AI is to bridge quality and quantity, interact meaningfully, gauge the character of reality, classify experience and learn about life contexts. This raises issues: how should we best understand these co-evolving relationships? And looking forward, to what degree will people suspend disbelief to gain gratification from AIs?

Chapter 7 accounts for virtual reality (VR). Beyond the boxy headwear, we can define this in terms of the factors that contribute to a sense of presence in a synthetic environment. VR fulfils both of the propositions about empathy given earlier in that wearers not only undergo aesthetic and sensational experiences with

people, objects, places, periods and cultures, but also that remote viewers (people and machines) may observe from a wearer's perspective, gauge experience and virtually 'be in their shoes'. Developing the principle of *affective witnessing*, this chapter draws upon interviews and interaction with documentary makers, market researchers, and technologists in the defence and policing sector. The first part analyses the use of VR in journalism and documentaries, drawing on what Chapter 2 will account for as 'interpretive empathy'. The second attends to interest in VR from the market research community, whose interest is attention, intention and quantifying first-person perspectives. The third examines VR and policing. While this is not an obvious application of VR technologies (games and pornography perhaps come more readily to mind), as with many of the cases discussed in this book, it is the outlying applications of empathic media that best illustrate its significance. This final section investigates how organisations from the United States to the United Arab Emirates are developing what I term 'empathic policing'. Here VR is used with wearables, head-mounted cameras and drones so police commanders may remotely witness what is taking place on the beat.

Of all the commercial sectors interested in emotional life, advertising and retail have the most to gain from understanding what we think, see, feel and do. The business of advertising is built on the suggestion that consumers are rational, sovereign and able to reject, ignore or accept advertising messages. Chapter 8 depicts that in a period keen on behavioural economics, consumer neuroscience and increasingly empathic media, never has the free-choice argument of advertising looked so suspect. Drawing on interviews with advertising agencies, marketers and technologists, it critically examines consumer research, omni-channel shopping (that merge online and offline), programmatic systems, augmented reality and retail contexts that pertain to 'feel'. Beyond tracking, AI systems can use emotional analytics to create marketing content. Under the rubric of what this chapter phrases as 'quantified bios', this chapter shows that empathic media are not simply about sensing life and experience, but the automation of consumer psychology.

Chapter 9 examines how 'personal technologies that feel' stimulate novel forms of human-technical intimacy. Exploring case studies on health, wellbeing, work and sex, I draw from interviews with a commercial life science company, a commercial neuro-technology research firm, an EEG headset manufacturer, developers of emotion-sensing wearables, a sex toy maker and a professional psychosexual therapist. What becomes clear is that developers are comfortable with corporations having ethically questionable influence over behaviour and emotional life. Problems are also raised about automated industrial psychology, bio-sensing and analytics employed to monitor communications, networks, relationships, location and devices for signs of emotional behaviour. This invites subtle questions, especially about corporate liability, data standards and the lack of agreed means by which emotional life might be benchmarked. The chapter then turns to sex. While hacks of sex-tech devices are relatively well known, they also raise issues about

secrecy, modern intimacy, the desirability of making sexual life machine-readable and transparency. Although widespread adoption of sex robots able to ‘feel-into’ behaviour remains to be seen, these too invite assessment of human relationships with technology. Are they simply of a functional ‘in order to’ form, or might anthropomorphism and projection play roles in mediating our connection with affect-aware technologies?

Chapter 10 attends to situations where empathic media are used to understand the civic bodies of what are variously referred to as ‘smart cities’, ‘future cities’ and ‘conscious cities’. To consider these developments, I draw upon interviews with city technologists, lighting companies, city experience analysts, and insights derived from numerous conversations at technology and smart city expos in Dubai, Barcelona, Cologne and London. What conjoins these developments is an intention to deploy sensing and communications technologies to surveil and generate intelligence about people, things and processes in urban environments. This encompasses everything from street lighting to in-house biofeedback. What empathic media represent in this context is sensitivity to the mood and emotions of inhabitants. While it easy to reach for the ‘dystopia card’ (and this would not be an incorrect thing to do), the politics of psycho-geography has a curious history drawing on liberatory Marxism and utilitarian thought. Guy Debord (1955) for example, in the 1950s, recommended that we study ‘the precise laws and specific effects of the geographical environment, consciously organized or not, on the emotions and behavior of individuals’. His idea was to reveal the lived conditions of citizenry. However, as cities see ‘algoratic’ possibilities and take on platform-like characteristics to sense, track, surveil and financialise psycho-physiological data, this raises questions about what kind of cities we want to live in. This chapter is critical and cautious of developments in autocratic as well as democratic states, but it does not reject the premise of mediated psycho-geography. As will be depicted, in addition to ‘societies of control’, other visions are realisable. This involves scope to use empathic media to improve the material space and infrastructure, annotate augmented city features, leave biometric markers of experience, tell stories, and use bio-sensing to enrich city life.

Chapter 11 turns away from technology to consider the regulatory and political dimensions of empathic media. Given that what these technologies represent is the endeavour to make emotional life machine-readable, and to control, engineer, reshape and modulate human behaviour, this matters. In assessing the policy dimensions of empathic media my discussion references the European regulatory context, but the arguments have global applicability. I focus on what might initially seem like an irrelevance: what of privacy if the data in question cannot be linked back to a person or personal device? Although information about emotions may certainly be linked with personal data, in many cases non-identifying data about emotions are being collected and put to work. The significance of this is that, while intimate, they are not strictly personal, at least as far as data protection

bodies conceive of privacy. Is this OK? To explore and address this I draw upon my own assessment of European data protection law, but also ethical discussions with partners from media law firms, a Queens Counsel (QC) with an interest in technology law, and civil society groups interested in privacy and data protection. I also discuss insights from my survey data collected about how citizens in the UK feel about identifying and non-identifying emotion capture.

Chapter 12 concludes the book by recapping its key themes and considering what is required for responsible innovation of empathic media. To explore this I draw upon outcomes from a workshop I organised featuring CEOs and others from emotion capture companies, the UK's Information Commissioner's Office, the UK's advertising self-regulator, civil liberties organisations, advertising agencies, security companies, psychologists, legal ethicists, and surveillance experts.

What should be clear from this opening chapter is that while this book promises to be wide-ranging in scope, its focus is clear: to assess the development, applications and implications of technologies used to 'feel-into' emotional life. As will become apparent, this raises four cross-cutting issues that will be addressed as the book progresses. The first involves the methods and assumptions made about what emotional life is. The second is the scope to use these insights to influence, which consequently raises questions about commercial and political power. The third is intimacy and that applications of technologies discussed in this book ask questions of privacy that it may not have all the answers for. Last – and I believe most important – is the overall desirability of making bodies and emotional lives machine-readable.

Note

- 1 Online surveys have methodological caveats including difficulties of presenting complex topics and minimal control over respondents' condition. They may be attentive or distracted. Furthermore, to reduce costs, the survey (conducted with ICM Unlimited) was part of an omnibus survey that collects data on multiple topics, so I had no control over where my questions featured. However, the upsides proved significant as I was able to obtain a respectable weighted sample of geographical regions, age groups, social classes and gender, while avoiding 'interviewer bias'.