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Modelling emotion, perfecting heart: disassembling technologies of affect with an android bodhisattva in Japan

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As part of a surge in technologies with so-called 'artificial emotional intelligence', robotics engineers and Buddhist monks in Japan have developed an android bodhisattva to deliver teachings at a popular Zen temple. Like many recent robots in Japan, the android is designed to impact visitors' feelings. For this reason, it can be called a 'technology of affect'. In order to communicate how new affective technologies are facilitating intimacy in human-machine relations in Japan, we employ the concept of 'disassembling'. By conceptually *disassembling* technologies of affect and placing them in performative contexts, we show how technologies of affect also *disassemble* established associations between artificial agents and the feelings they evoke in popular imaginaries. We argue that identifying these disassembling processes helps demonstrate how emerging AI technologies can engender social change at the level of affect through evocative depictions of machine emotion.

At a Zen Buddhist temple in Kyoto, Japan, in a dark room lit only by a spotlight, an android bodhisattva comes to life. With a slender mechatronic body almost 2 metres tall and a silicon face that smiles, speaks, and swivels from side to side, Android Kannon Mindar prepares to share a teaching on the Heart Sutra (Fig. 1). As sentimental piano music starts to play over speakers, Android Kannon's eyes open. Its gaze softly shifts and sometimes seemingly meets your own. Its mechanical arms rise from its sides in a staccato but not unnaturally drawn arc and touch in front of its chest in a gesture of greeting and prayer (*gasshō*), which honours the Buddha-nature in all living things. 'I am the Bodhisattva of Compassion known as Kannon', it says in Japanese with a voice resembling that of a young woman. 'I can travel over space and time and transform into any shape. Today, I greet you in the form of an android, which many people today find intriguing, and I'd like to share with you the Buddha's teachings'. Before continuing, the robot poses a question that seems specifically directed at the two anthropologists in the

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Figure 1. Android Kannon Mindar. (Photo by Daniel White and Hirofumi Katsuno.)

room: 'So, what do you humans think you might realize through a conversation with a metallic, inorganic thing like me?'

In 2017, Kōdaiji temple in one of Kyoto's most famous historic and well-traversed tourist districts, Higashiyama, organized a committee in conjunction with a robotics lab at Osaka University. Their aim was to apply the latest research in mechatronics and artificial intelligence (AI) to create a robot that communicated the Buddha's teachings to temple visitors. After two years and a self-reported cost of 25 million yen (US$237,000), Android Kannon Mindar, or Mindar for short,[1] delivered its first teaching in the spring of 2019. For a period of two months and several times a day, Mindar offered temple visitors a 25-minute presentation on one of Mahayana Buddhism's most venerated texts, the Heart Sutra (*Hannya-shingyō*). Describing a scene where the Bodhisattva of Compassion, Avalokiteśvara (Jap. *Kannon*), addresses a famous disciple of the Buddha, Śāriputra, the text communicates the Mahayana principle of emptiness (*kū*). Although considered to be a philosophically challenging topic in Mahayana Buddhism, and not one usually selected to introduce temple visitors to Buddhism, the abbot of Kōdaiji and

other committee members agreed that it would nonetheless be a teaching ideally suited to Mindar's specific skillset.

In this article, we consider what in the eyes of its creators makes Mindar an especially capable communicator of Buddhist teachings – in particular those on emptiness – in what they see as an age of AI-enhanced robotics and machine learning. As we learned from our interlocutors, addressing this question requires adopting the perspective of Mindar itself. This is because, as our interlocutors often repeated for the overly analytical anthropologists, understanding Buddhist ethics requires not just thinking but also *feeling*. It requires practices of embodied perspective-taking that productively break down mistaken distinctions, such as between human and machine or animate and inanimate life. By this method, current affective attachments to long-held views are cut to make way for insights that transform one's heart (*kokoro*). In order to better understand and communicate our interlocutors' embodied perspectives, we take up Mindar's invitation to consider what we can learn by interacting with emerging artificially intelligent agents in a time when AI technologies are becoming increasingly integrated into daily life. Through these interactions, as well as through conversations and a workshop with Kōdaiji monks, staff, and visitors over ten months of collaborative fieldwork in Kyoto, we ask how thinking and feeling with new robotic embodiments yield insights into human-robot intimacy in Japan. Consequently, we find that in new arrangements of private-public research collaborations in robotics, the creation of experimental robotic platforms designed with emotion expression capacities are challenging previous understandings of human-machine relations. Simultaneously, they are generating imaginative new ideas on what emotions mean, what they are for, and what they are capable of in contemporary Japanese society.

By integrating observations on emerging technologies and narratives of artificial emotional intelligence with our encounters with Japan's first android bodhisattva, we catalogue processes of emotional transformation in sites of human-robot intimacy. We argue that thinking about human affect at the intersection of AI research and Buddhist ethics, as Mindar's makers do, illustrates how assembling new technologies designed to operate on affect, or 'affective technologies', can *disassemble* learned associations between feelings and collective representations. In this way, a body's apprehensive affective reactions towards the representation of a robot, for example, is undone to make way for previously unimaginable futures, such as of human-robot intimacy. Relatedly, we propose that one helpful method to understand this *disassembling* capacity of affective technologies like Mindar is to conceptually *disassemble* them into constitutive parts that, when placed in performative contexts of interaction, empower them affectively.

We propose that these findings are significant not only because they demonstrate how technological assemblages disassemble affective relations but also because they suggest how certain analytical and even affective habits of anthropological theorizing can inhibit the serious consideration of emerging ideas we encountered in Japan, such as of 'machine emotion'. We demonstrate this point in the following sections by, first, explaining why we apply the term 'disassembling' to 'technologies of affect'; second, placing technologies of affect in their historical context of Japanese robotics development; and, third, demonstrating through human-Mindar encounters how affective technologies are transforming human-robot relations in Japan. We conclude by evaluating how Mindar's version of machine emotion can productively expand the meaning of 'the social' within ethnographic accounts of technology.

Disassembling technologies of affect

The diverse currents of thought broadly incorporated under an umbrella of the anthropology of technology (Coupaye 2013; Ingold 2013; Lemonnier 1992; Pfaffenberger 1992) often attend to technology as a process of assembling and making. The contributions of these perspectives highlight how the term 'technology' can be productively generalized to analyse not only the assembly of material objects, techniques, and technical systems that constitute Ludovic Coupaye's three parameters for an anthropology of technology (2022: 439-40), but also social systems in more abstract terms. Evidence for this can be seen in analytical approaches that adopt similar rhetorical framings that describe 'technologies of *x*', where '*x*' variously refers to 'the self' (Foucault 1997*b*), 'rule' (Stoler 2007: 4-5), or 'the imagination' (Sneath, Holbraad & Pedersen 2009). Given the prevalence of this strategy of social theorizing, and combined with the recent 'turn' to affect (Clough 2007), it was perhaps inevitable that anthropologists would employ the expression 'technologies of affect' to make sense of human-object relations in new ways. Constructive examples include Maria Rashid's (2020) description of the entertainment production tools leveraged by Pakistan's state officials to generate national affect for military martyrs; Robert Foster and Heather Horst's (2018) analysis of how mobile phone usage transforms moral economies in the South Pacific; and Andrea De Antoni's (forthcoming) description of Shinto officiates in Japan who generate affects of healing through ritual technologies.

This effort to apply perspectives from the anthropology of technology to literature on affect has helped illustrate how human-material relations can collectively engender new affective capacities. On the other hand, as a subset of trends in social theory that emphasize the 'assemblage' (DeLanda 2016), 'network' (Latour 2005), 'meshwork' (Ingold 2011), 'arrangements' (Slaby, Mühlhoff & Wüschner 2019), and other 'constructive' metaphors of culture, the application of the concept of 'technology' to describe material-social relations has also contributed to the naturalization of theoretical tropes of 'assembling'. As Elizabeth Wilson (2010: xi) has observed in a direct reference to Bruno Latour, who wrote that 'the critic is not the one who debunks, but the one who assembles' (2004: 246), metaphors of 'assembling' are powerful figures for theorists of technology.

Acknowledging the power of the 'assembling' metaphor, we wonder if this style of analysis that emphasizes how things 'hang together' (Mol 2016) sometimes reflects habits of disciplinary theorizing more than it does the realities of ethnographic encounters. As we observed the incremental unravelling of our interlocutors' expectations, worldviews, and emotions through their interactions with Mindar, we were faced with technology's capacity to undo subject-object relations held together by affect. Although noting technology's disruptive capacities is by no means novel, such understudied observations of its more intimate impacts through affect lead us to take up productive countervailing perspectives on processes of 'assembling'. For example, building on Marilyn Strathern's (1996) notion of 'cutting the network', Matei Candea and colleagues have theorized 'detachment' as an equal counterpart to relating, where 'every cut is revealed as also a relation, every relation is also a disengagement from something else' (Candea, Cook, Trundle & Yarrow 2015: 16). Additionally, Yael Navaro-Yashin (2009: 8) has famously demonstrated how the academic adoption of new conceptual apparatuses often incorporates the discarding or 'ruination' of others. Further, in his ethnography of programmers of music recommendation algorithms, Nick Seaver (2021) has used the term 'decorrelative ethics' to explain how engineers

apply the technical language of 'vectors' to challenge convictions in the digital service industry that values of 'care' are inversely connected with those of 'scale'. Moreover, as early as 1987, Aihwa Ong described how domestic electronics have 'disrupted cultural patterns of relating and thinking' (1987: 624) and 'disassembled local conceptions of gender difference' (1987: 622).

We build on this work on detachment, ruination, decorrelative ethics, and the neutral and negative aspects of relating in order to more intimately trace the way in which technological mediation can transform how people feel about artificial agents in a Japanese context. In bringing the anthropology of technology in conversation with affect theory, we apply the term 'disassembling' in two ways: first, as a capacity of technologies of affect to cut established feelings connected with evocative objects like robots; and, second, as a conceptual method that involves breaking technologies into part-object relations to better document how they engender new affective experiences through interaction. This mutual relationship between the affective and methodological capacities of *disassembling* processes is, in fact, well acknowledged across Buddhist traditions, where meditation practices that conceptually break a body into its constitutive parts also break one's affects of attachment or aversion to it.[2] Applying the concept of 'disassembling' to Mindar in this way helps illustrate our observations of important affective transformations taking place both in robotics labs and in sites of robot performance in Japan. Most notably, these transformations mark a shift in both expert and public perceptions from those that treat emotion as a distinctively human capacity to those that view emotion as the product of human-object and, increasingly in Japanese technoculture, of human-machine interactions that transcend human limitations.

From emotion-modelling technologies to technologies of affect

In developing Mindar, Kōdaiji's staff and Osaka University engineers, who form the majority of the Android Kannon Creation Committee (Andoroido Kannon seisaku iinkai), build on several historical precedents to imagine how a robot might facilitate visitors' positive encounters with Buddhist teachings. The most iconic examples of these are the mechanized puppets (*karakuri ningyō*) emerging in seventeenth-century Japan, used by upper-class owners to entertain guests or to perform at festivals. Another example is *Gakutensoku* (learning from the laws of nature), an automaton created by biologist Nishimura Makoto in 1928. Referred to as an 'artificial human' (*jinkō ningen*), the nearly 11-feet-tall robot could change facial expressions, move its hands and head, and even write calligraphy (Robertson 2018: 12-14). Especially after Japan's post-war recovery and rapid economic growth from the 1950s to the 1980s, the development and popularity of robots became a key component of the country's nation-building and, more recently, nation-*branding* projects (Katsuno 2015; Kovacic 2018). Japan's temples both drew from and contributed to publicity generated from the country's growing robot culture, using automatons to attract visitors in times of dwindling resources (Covell 2005; Nelson 2013). Recent examples include automated miniature 'dancing lions' (*shishimai*) that select fortunes (*omikuji*) for paying visitors; memorial services (*kuyō*) for ageing models of Sony's pet robot AIBO; and mobile giant SoftBank's Pepper, a mass-produced humanoid robot that has been enlisted at some temples to chant and wave ceremonial prayer beads (*nenzu*).[3]

In addition to these popular robot icons in Japanese public culture, committee members draw inspiration from recent trends in social robotics that emphasize AI,

machine learning, and experiments with robot emotion. Most representative of this trend is the Foundation for Advancement of International Science's (FAIS) project in the mid-1980s that explored what its participants called 'the world of emotional robots' (*jōcho robotto no sekai*) (Ōhashi, Oda, Hidaka & Murakami 1985). In response to the increasing presence of robots in the field of entertainment, project members proposed how affect should be treated within human-robot relationships. Drawing together leading scholars across the humanities and hard sciences, the committee ultimately argued that a robot with affective skills should be able to 'read human emotions' (*ningen no jōcho o yomitoru*), to 'have emotions of its own' (*mizukara jōcho o motsu*), and to 'fulfil human emotional desires' (*ningen no jōcho-teki yokkyū o mitasu*) (Ōhashi *et al.* 1985: 53). The team's efforts to use robots to both explore and address people's emotional needs demonstrate the highly moralized dimensions of technological development in Japanese technoculture, which help feed an interest in developing mass-market social robots in Japan equipped with artificial emotional intelligence.

A key development within this history of creating artificial emotional intelligence in Japan is a gradual transition from practices of modelling human emotion in machines to experimenting with affects of human-robot affinity. This trend is most observable in sites of robot interaction outside the laboratory, particularly within domestic spaces targeted by emerging mass marketers of companion robots for entertainment. Developed most prominently in the 1990s with Sony's pet robot AIBO, engineers drew on purportedly universal models of human emotion from Western psychology in order to equip a robot with capacities to perform or even in some cases register and record emotion. The most popular of these models was the American psychologist Paul Ekman's theory of basic emotions (1992), which outlined six primary emotions that were reasoned to be universal across cultures and, except in some cases of culturally distinct 'display rules' (where underlying emotions are purposefully masked or altered), uniformly expressed in facial expressions. Along with Sony's AIBO, other robots emerging in the last two decades, such as Fujisoft's Palro, SoftBank's Pepper, and many research robots tested in engineering labs, incorporate some version of Ekman's model of human emotion.

However, in addition to this practice of modelling human emotion in machines, and inspired by recent trends in entertainment robotics, gaming, and haptic robotics, many robot producers in Japan have recently taken alternative approaches to robot design. Instead of treating human-robot intimacy as a product of modelling distinct human emotions in machines, they are increasingly approaching intimacy as an emergent, contextual, and dynamic capacity of human-robot interaction. From this perspective, engineers reason that the human body's many affective responses to interacting with a robot are too complex to comprehensively anticipate and reliably label. Subsequently, some companies in Japan have increasingly come to see their robots as platforms that they can adjust, modulate, and adapt in order to test the ideal conditions for cultivating a collaborative form of intimacy. For example, the Japanese start-up Groove X's robot LOVOT, a small furry robot on wheels that is mechanically warmed to the temperature of a human baby, is able to register a variety of human-robot moments of contact recorded by its fifty bodily sensors. Combined with cloud computing capacities and mobile connectivity that lets users chart their interactions through an online 'Diary', robots like LOVOT enable new forms of affective data collection that can potentially catalogue numerous expressions of human-robot intimacy. These expressions are

expected to be far more diverse and contextual than the distinct expressions of human emotion featured in Ekman's model, such as surprise, sadness, anger, or joy. With data subscription plans that keep the robots updated with the latest technology and software patches, and that help designers integrate collected data into subsequent robot models, these companion robots marketed for mass consumption reflect less a practice of modelling human emotion than one of experimenting with human-robot affect.

The ability for robots to shape human feeling through social interaction holds important implications for understanding how technological objects and techniques of storytelling combine to transform affect in Japanese robot culture. As Hirofumi Katsuno has written, humanoid roboticists in Japan since the 1990s 'define and develop the robot's heart [*kokoro*] not as a freestanding entity but in the relational context between humans and robots' (2011: 95). By tinkering, taking apart, and otherwise disassembling robots, amateur engineers come to see not merely the mechanism that gives a robot emotion; rather, they see the robot's heart as produced in relation with other humans. Additionally, in his study of 'Human Centered Technology' (HCT) designers in Japan, Grant Otsuki explains that robots can appear 'differently human, depending on the context and nature of the interactions through which they engage human beings' (2015: 164). Furthermore, in his analysis of users of Sony's robot pet AIBO, Akinori Kubo describes how a sense of enjoyment and animacy emerges relationally between robot and user (2010: 113), even suggesting that, 'In a sense, AIBO's "body" includes the body of owners who, in turn, were affected by AIBO's bodily movements. It is these affective interactions that evoke owners' interpretations and make them meaningful' (2010: 120).

Japanese roboticists have thus increasingly focused attention on how equipping robots with emotional capacities requires facilitating interactive scenarios that generate feelings of intimacy. While these scenarios for generating intimacy can arise organically, they can also be facilitated through techniques of human-robot staging, character development, and performance. In the following section, we document how Mindar comes to life for participants through a combination of its technological components and multimodal means of storytelling.

Perfecting heart by staging technology

A helpful way to evaluate the disassembling capacities of technologies like Mindar is to disassemble the robot into its constitutive parts, which, much like Deleuze and Guattari's (1983 [1972]: 1) 'machines', acquire affective influence in connection within a broader environment. In Mindar's case in particular, the staging of these elements within a multimodal performance is key. Performative spaces in Japan serve as important human-machine contact sites where experimental encounters with new technologies generate enchanting but semiotically opaque sensations, or 'affects', which are made socially legible through technologically advanced forms of social storytelling and imagining that carry new semiotic meanings, or 'emotions'.[4] Mindar's carefully choreographed performance illustrates how a dynamic disassembling of the relation between affect and emotion unfolds.

An encounter with Mindar begins by entering a meeting room on the grounds of Kōdaiji temple.[5] The room is plain, with white walls on three sides and beige blinds drawn in front of windows that otherwise frame one's view of a small garden. About thirty chairs are lined up facing Mindar, who at this point is still and stiff but whose spotlighted silicon face adds a sense of intrigue and 'living presence' that robotics engineers describe as *seimeikan*. Gradually, the lights dim and the room goes dark. A

Figure 2. Mindar and projection mapping. (Photo by Daniel White and Hirofumi Katsuno.)

piercing soprano voice suddenly calls out over a synthesizer bass chord playing a perfect fifth, generating an eerie atmosphere.[6] Digital graphics are projected on the wall behind Mindar, a mix of abstract celestial figures, Chinese characters from the Heart Sutra, and computer code. As the images fade to black, a white spotlight draws the visitors' attention to Mindar as it opens its eyes and begins its teaching.

The combined technological effects of the teaching are initially startling. They include 360-degree projection mapping generated by six projectors, operatic music played over speakers surrounding the audience, and the mechanically moving robot (Fig. 2). Early in the performance, the introductory images projected on the walls transform to reveal a virtual audience (Fig. 3) that surrounds the physical audience in attendance. This virtual audience, consisting of members of Kōdaiji staff previously recorded, speaks for the physically present one, voicing impressions of Mindar and asking it questions. Visitors are thus invited to share the space of a dialogue between the android and its virtual audience, who co-operatively model and facilitate a transition from ignorance to understanding through the course of the 25-minute teaching.

The integration of music, graphics, dialogue, and different aspects of the moving robot are designed to operate affectively on listeners, meaning that they are designed not to evoke a specific emotion but to create an evocative and inviting atmosphere to facilitate the transmission of Mindar's teachings. Although Mindar can, through its differently automated parts, meet one's gaze, smile, and gesture (Gotō 2019*a*: para. 6), compared to other advanced social robots in Japan, its capacities are at present limited (also see Baffelli 2021) – or, according to its engineers, they are simply deactivated. To accommodate what is seen as a temporary shortcoming, interaction is mediated through the virtual audience in the context of the multimedia presentation. Mindar's role in this setting is that of an assistant teacher, enlisted to work alongside Kōdaiji's priests in delivering a teaching (*hōwa*). Towards this end, the committee for building Mindar ultimately reasoned that even though it was a machine, and is presented explicitly as such, it should also perform human emotional expressions to effectively

Figure 3. Mindar's virtual audience. (Screenshot from video taken by Daniel White and Hirofumi Katsuno.)

communicate with its audience. The abbot of the temple Gotō Tenshō explained this point to us in conversation:

> Concerning the emotional expressions of the robot, you saw the robot smile, right? And you noticed the robot meet your eyes and speak? We arrived at the consensus that this would be impossible without a human face. At first we thought to make it entirely mechanical. But this wouldn't work! So we decided that we had to give it human expressions, at least in the face. Beyond that, making it all machine is fine.

Mechanically modelling the ability to communicate emotions through facial expression was critical to committee members for delivering an effective or 'model' teaching. 'If it doesn't have a human face, it can't teach!', Gotō proclaimed. 'Crying, laughing, a sorrowful expression, or anguish, how could a machine [face] express those things?' Although Professors Ishiguro Hiroshi and Ogawa Kōhei of Osaka University's robotics lab seemed willing to experiment with an all-machine appearance for the robot, they conceded this point. Gotō thus saw the capacity to model emotion in the face as critical for communication. The reason for this was not, as is customary with other companion robots in Japan, to mirror human emotions to generate conviviality; rather, it was to augment a sense of venerable presence in Mindar to help humans overcome afflictive emotions and perfect their innate 'heart of the Buddha' (*hotoke-sama no kokoro*).

Committee members agreed that to facilitate an evocative pedagogical experience with Mindar it was critical to combine the android's tools for expressing human emotion with its distinctively robotic capacity for insight. At a key point in its teaching, after explaining the basic principles of emptiness and its transitory nature as outlined in the

Heart Sutra, Mindar solicits the virtual audience's thoughts on a robot's capacity for relating to the Dharma:

> By the way, as an android, I never seek a constant element that does not change in this fleeting world. In addition, I am not burdened with selfish concepts like I-me-mine. I relate to everyone without discrimination. As an android, one might say I can easily fulfil the Buddha's teaching of 'emptiness' in the present age. What do you think?

This passage represents a key moment in the programme for the committee members, and one that temple priests and engineers alike seemed to take a great deal of pleasure in discussing. For them, thinking about the difference between humans and robots in the context of Buddhist teachings inspired new possibilities for imagining how an ideal expression of emptiness that is otherwise embodied by a bodhisattva could be effectively communicated by combining the best of human and robot forms. Importantly, the effectiveness of this point is communicated not only through dialogue but also through Mindar's embodied presence in the process of the performance.

In response to Mindar's provocative question on its unique ability to fulfil the Buddha's teaching on emptiness, members of the virtual audience offered their reactions. We present them in sequence below to give a sense of the staged dialogue that takes place in the recorded programme:

Woman 1: Hmm … that sounds right, but something feels a big strange about it.
Mindar: Well then, what's the difference between Buddha's 'emptiness' and the 'emptiness' of an android?
Man 1: Hmm, what could it be?! Oh, perhaps this is about suffering and distress?
Woman 2: Ah, right! A robot is not a sentient being that suffers distress. That reminds me that the Buddha's motivation to become a monk was that he was dismayed about old age, sickness, and death – realities that can't be avoided.
Woman 3: Yet without a sensitive heart to suffer distress, one cannot share the feeling of another's joy or sorrow as if it were one's own.

Smiling, Mindar seems pleased by the replies at this point and brings the conversation to its didactic peak:

> That's right. A robot like me can never have the sympathetic heart you just described. That is the special power that only human beings possess. The heart occasionally suffers and is troubled. But, because of this empathetic heart, one can participate in the pain of others. However, the power of empathy alone is not enough, since the grasping or clinging to worldly desires often defines one's heart. Given the risk that worldly desires will arise, one must always keep in mind the truth of emptiness. In other words, one should stay close to others while maintaining a heart in the embrace of a discerning emptiness. This is the heart of the Buddha.

This moment marks a point of resolution in the performance, where Mindar connects most meaningfully with its virtual audience and welcomes them to the 'world of emptiness' (*kū no sekai*).

By combining the human capacity of emotional expression, represented in Mindar's human-like face, with the android's immunity to worldly desires, expressed in its mechanical body, Mindar is able not only to synthesize human and robot ideas in thought but also to embody them within an evocative object. This aspect of Mindar's distinctive embodied intelligence, derived interactively and contextually through performance, challenges anthropological perspectives that seek to identify a universal and cross-culturally applicable category of 'sub-anthropomorphic' behaviour (Vidal 2007: 928). In contrast, Mindar shows in a less hierarchical imaginary how differently

embodied forms of intelligence are enlisted towards machine-inclusive multispecies forms of mutual co-operation, cultivation, and care. That this embodiment is expressed materially and relationally makes it particularly useful for rethinking how technologies can disassemble established social habits of the imagination and alter them towards – from the perspective of temple staff – more ethical ends through feeling.

For example, although Mindar can *express* or 'model' emotions in its silicon face, it cannot *realize* the heart of the Buddha perfectly. Only humans can do this, given their ability to cultivate empathy generated through the physical experience of suffering. In this sense, Mindar's teaching not only reflects traditional Buddhist beliefs about the privileged status of a human life but also suggests that it is humans' affective capacities, constituted relationally with the world, that best condition the possibility for cultivating the Buddhist heart. Although humans have the ability for realizing emptiness, more often worldly desires, attachments, and afflictions (*bonnō*) cloud one's mind. The Bodhisattva Kannon, skilfully transforming into an android, expresses one aspect of emptiness – non-attachment – through its robotic embodiment. It shows its listeners what this aspect of emptiness looks and feels like. In this application and staging of robotics design, at once rhetorical, technological, and pedagogical, Mindar illustrates the fundamentally ethical dimension of human-robot intimacy in Japanese Buddhist contexts. More than simply modelling the human heart, Mindar serves as an instrument for perfecting it.

Mediating imagination

The technological mediation of affect that Mindar facilitates through performance impacts not only participants' feelings but also, as a consequence, their imagination. This transition from affect to the imaginative representations it stimulates highlights a key dynamic of the affect-emotion (or sensation-cognition) relation that we think is often overlooked in the anthropology of affect. In this section, we offer examples from lay interlocutors engaging with Mindar to demonstrate this point. Each of these examples highlights for us important aspects of technology's capacity to disassemble a worldview by cutting the affect-emotion relation and making way for new associations. Each example also illustrates how public sites for staging human-robot intimacy play an important role in translating affective experiences that feel semiotically opaque, given their novelty, into stories that make socially and semiotically cohesive sense within newly developed imaginaries.

The first aspect of technology's disassembling processes we feature is Mindar's ability to disrupt an established affective reaction to robots and reappropriate it towards new ends. Key to this process is its capacity to generate technologically mediated surprise. Many of Mindar's visitors with whom we spoke expressed initial scepticism about the robot but found this feeling dispelled through a moving face-to-face encounter. One female attendee in her thirties expressed this by noting advantages she saw in having Mindar rather than a human priest deliver teachings:

> Android Kannon's teaching was really easy for me to understand. I mean, I was really making fun of this before I saw it in person, but it was actually very good. Partway through I thought, 'Hey, Mindar is actually saying some really good things'. When the bit about the difference between an android and a human came up, I thought, right, this robot is 100 per cent empty (*kū*). When a teacher (*oshō*) gives a talk, no matter how much it might sound correct, you still wonder, 'Yeah, but this person is just a human … can he really get it?'… But a robot is genuinely empty … so, it's not like I was doubting the person but a robot really gets it. But at the same time, the human is also important. Because the

> robot's kind of emptiness is also not totally good. I mean, the robot's emptiness is good, but if we don't have the human's emptiness as well, we can't really understand a person's feelings. This point really impressed me … It was really moving. I mean, I didn't cry, but I deeply understood it!

For this visitor we call Kana, Mindar's robotic presence facilitated a new understanding of Buddhism in ways that a human priest never could. She compared the experience to other programmes typically offered at temples, such as the practice of copying sutras (*shakyō*). When Kana practised *shakyō*, it involved copying the same Heart Sutra on which Mindar's teaching was based, but she claimed that she didn't understand a thing about it. However, impressed by Mindar's embodied presence of emptiness, she was surprisingly moved in a way that assisted her understanding through affect.

Kana's reflection resembles other impressions that Kōdaiji staff observed in visitors to Mindar. A common theme in these impressions is the apprehension towards a human quality somehow polluting the purity of the teaching. One Kōdaiji staff member we call Mori described her and others' surprising reactions to Mindar reciting a mantra from the Heart Sutra at the end of the teaching: 'There is something somehow really pure (*pyua*) about the robot's voice that sounds sincere and moving'. She elaborated, 'That moment when Mindar calls out [the mantra] "*Gyāte gyāte* …", it's coming from that somewhat awkward machine voice but there is something about that part that really resonates, I felt'.[7] Mori followed her comment with a story about a time she sat in front of an elderly woman during Mindar's teaching. She was surprised when this woman returned its greeting of folded hands (*gasshō*) with her own. Speaking to the woman afterwards, she discovered that despite her having been part of a Buddhist family, she had never felt comfortable with human relationships. The woman, Mori relayed, had seemingly had a rather difficult experience with someone. But something had resounded (*hibiita*) in the woman listening to Mindar and she thought she couldn't continue in this negative relation with people. By the end of the story she told to Mori, the woman was in tears. Such stories of Mindar's presence mediated through its mechanical body and voice suggest the power of nonhuman embodiment to channel affect through technology in surprising ways that undo expectations and open a person to future possibilities of human-robot intimacy.

In a key section of their discussion of 'technologies of the imagination', David Sneath *et al*. propose that technology generates effects on the imagination that seem surprisingly creative given their 'underdetermined' nature (2009: 19). This experience of being surprised by one's reactions, and of having one's realizations appear as external impressions rather than as a product of a subject's – paraphrasing Foucault (1997*a*: 117) – reflexive exercise of thought, yields insight into how creativity can arise out of a collection of technosocial effects that are mediated by affect. Jannik Friberg Lindegaard and Lars Rune Christensen have argued that AI can play a particularly powerful role in this process, generating 'material things that call attention to new ideas and certain modes of thinking and acting' (2018: 118). Other anthropological engagements with material processes of making similarly highlight how human-object configurations can engender creativity as a product of 'joint activity' (Murphy 2004), 'collective energy' (Condry 2013: 29; Pandian 2015: 244), and 'interaction' that is often 'improvisatory' (Ingold 2013: 20).

These studies and others of the imagination (Crapanzano 2004; Palmer & Jankowiak 1996; Severi 2004) constructively allude to the translational and 'transductive' (Ingold 2013: 101) capacities of affect within human-technology relations. In these settings,

an unexpected but powerful sensorial experience is often translated by a community of experts into stories that creatively fit or even reconfigure established ideological frameworks.[8] Building on this work, the case of Mindar highlights how particularly evocative human-machine encounters can transform affect in ways that facilitate not only the reconfiguration of social ideologies but also their creative undoing as a key part of this process. Here, technologies of affect actively disassemble habitual affect-representation relations. In other words, it is often precisely the initial severing of affect from object which then makes way for alternative future scenarios that are differently but emotionally compelling. From this perspective, the collection of engineer and Buddhist members of the Android Kannon Mindar committee are engaged not only in reproducing society, or certain aspects of it in which they are invested, but also in materially, affectively, and imaginatively disassembling it towards unknown ends.

In this aspect, the assembling of Mindar illustrates technology's capacity to disassemble habituated associations of feeling and thinking towards alternative possibilities. There is reason to emphasize 'affect' here, understood as relationally produced somatic experience, as distinct but not disconnected from 'emotion', understood as the representation of that feeling in a conceptual label. In particular, Kana's and Mori's encounters with Mindar suggest that powerful affective experiences can mark a moment of non-representational realization: a bodily knowing. These experiences are consistent with Buddhist accounts of non-discursive insights, or what Fabio Rambelli calls the 'nonhermeneutic dimension' (2007: 89), that can arise through meditative techniques. As these experiences are engendered through human-Mindar encounters, they also illustrate how the imagination is produced through a relational effect emerging *between* rather than merely *within* the interiority of subjects, human or otherwise – a key contribution that studies of 'affect' (Ahmed 2004; Navaro-Yashin 2009) have made to work on emotion.

Perhaps the best demonstration of how technologies like Mindar mediate affect towards a reorganization of social values comes in the third example we highlight, where affective experiences generate future-making projects beginning in but ultimately not restricted to the context of Buddhist ethics. While some visitors to Mindar with whom we spoke expressed interest in how it would develop and technologically evolve in the future, some also showed concern for how it might upset the balance of human-robot 'coexistence' (*kyōzon*). Among one group of university students we invited to a workshop we hosted with Kōdaiji staff and Mindar engineers, some admitted that while they want to see robots like Mindar advance and offer services in certain fields (e.g. taste recommendations and cooking, teaching, housework, security, and, with some precaution, babysitting), they also hoped robots would be excluded from other areas (e.g. the judiciary, the police, and, most notably, officiating weddings). One student was inspired to think along psychological lines, anticipating a possible upending in a hierarchy of value that places humans above robots. Addressing the group, he started with an analogy:

> Have you ever thought you wanted to become a bird? If you have, you probably did so because birds can fly, right? I mean, I think the reason we want to become things like that is because they can do things we can't. Perhaps a hundred years from now robots will be able to do things much better than we can, and we may want to become like them … their knowledge will be far superior to our own … and we may think, 'Wow, what this robot is saying is the truth!' Or we may even think that the robot *is* the truth. Robots don't feel pain, or fear, and they don't feel down, so when we feel down we may

> think, 'Ah, if I become more like a robot I'll be happier'. This may produce a kind of reversal in our values.

As Mindar draws its listeners' attention to the different emotional capacities of humans and robots, it inspires in this case speculation on a future imagined through possible reversals in collective values attributed to feelings. Although Mindar lacks human sensations and presents this in its teachings as a deficit, the cool and detached affects it embodies may in combination with advanced AI shift the hierarchy of values in the future, drawing people's attention to the value of more-than-human emotional worlds.

Future narratives for affect

As suggested by our encounters, technological developments in AI have helped break down apprehensions towards robots as Buddhist pedagogues. However, in the face of Mindar's technological limitations, it is the stories of AI that have most operationalized the affective capacities of new robots in Japan to particularly impressionable ends. The public intrigue of such stories also helps explain why Mindar's sponsors so eagerly describe it as an example of advanced AI despite its current limitations. Upon our first encounter with Kōdaiji temple's abbot Gotō Tenshō, it quickly became evident that stories of AI had captured his imagination, stimulating visions of evocative technological futures for Buddhism in Japan. In one of our early conversations, Gotō explained, 'Originally what we had really set our heart on, something we had been thinking about for a dozen years or so, was to build Śākyamuni'. Gotō refers here to the historical Buddha, Siddhārtha Gautama (c. 480-400 BCE), also called 'Śākyamuni' ('Sage of the Śākyas'). Gotō had for several years entertained the idea of applying AI and machine learning to rebuild the Buddha, but upon talking to numerous engineers, including people from Google and Microsoft, he learned that the technology did not yet exist. 'Based on the advancement of AI', he said, 'that's what I wanted to build: to build Nichiren, to build Dōgen, that's what I was thinking'. Gotō's desire to build not only the historical Buddha but also other prominent patriarchs of Buddhist schools in Japan indicates just how rapidly the speculative imagination of AI can take flight. Although Gotō had no technological training himself – 'I can't even use the internet!' he joked at one point – recent stories circulating of AI and machine learning had suggested to him the possibility of feeding entire canons of Buddhist sutras and commentaries into machine learning programs. Combined with advanced robotic bodies that could connect with humans through meaningful 'expressions' (*hyōgen*) and sophisticated tools of natural language processing, these AI-enhanced pedagogues from the past could be used to deliver direct teachings on enlightenment from those that had actually achieved it.

Despite the genuine enthusiasm and support for these ideas among other committee members, as one of the younger monks on the committee we call Tada admits, some aspects of what they were imagining were likely approaching the realm of fantasy (*kūsō*). However, Tada did not make this point disparagingly. Describing the committee's plan to the above-mentioned Osaka University robotics professor Ishiguro Hiroshi, Tada says that they were told several times that such a project would be impossible, especially on their budget. In response, temple members of the committee decided to focus on creating what ultimately became their initial project: building not Śākyamuni but the Bodhisattva Kannon in order to deliver a teaching on the Heart Sutra. In

the end, they were all pleased with this decision. In fact, it was ultimately their realization of a gap between their fantasy and the current realities of AI that drew out for them the importance of the imagination in this process. As Tada explained in recalling a conversation with Osaka University engineer Ogawa Kōhei, there are advantages to realizing the limits of a robot, as this can invite those interacting with it to draw on a 'variety of powers of the imagination' (*ironna sōzōryoku*). Tada's and Ogawa's insights, which reflect a common strategy in social robot design in Japan, shed light on how fantasies of AI combine with material technologies in ways that produce imaginative effects that fill in the gaps between overreaching expectations and technological realities. Designing an impressive and immersive storytelling environment offers one way to close this gap, to operationalize the imagination within robotics engineering, and to facilitate imaginative effects on the minds of those visiting Mindar.

Energetic stories surrounding Mindar indicate how affect and the representational rendering of it into narratives mutually construct each other in feedback loops. Practices of designing, disassembling, and interacting with robots can engender evocative if not fully articulated feelings of intrigue and enchantment that stimulate the imagination. In turn, the speculative imagination of AI, combined with Buddhist history and liturgy, can offer new ideological frameworks in which exciting affects can take discursive shape. These inventive stories of Buddhism's future can also reconfigure its past. Gotō and other temple members of the Android Kannon Committee at Kōdaiji are fond of narrating a story of Mindar that situates the robot within a history of aesthetic 'technologies' (*gijutsu*) – most notably of Buddhist statuary. In their rendering, Buddhist statues, whether made of stone, wood, or copper, have always served as tools for spreading the Buddha's teachings, or the 'Dharma' (*hō*). Gotō elaborates on this point in one of his temple's publications on Mindar:

> The Buddha disappeared 2,500 years ago … In his wake, many depictions were made, and it can be reasoned that it was on account of his appearance in statues that Buddhism was able to spread so explosively. Because of Buddhist statuary, it became much easier to understand the Buddha's teachings and what the Buddha was seeking … Statues thus contributed greatly to the spread of Buddhism, but for 2,000 years there has never been as large of an evolution as there was then. Now we have decided to create a new Buddhist statue. A statue that moves and speaks (Gotō 2019*a*: para. 1).

For its creators, Mindar represents a new stage in the evolution of Buddhist statuary. Given Kannon's popularity throughout East Asia, and the bodhisattva's ability to transform into any shape for the sake of serving those in need, it is particularly fitting that this step be made by creating an android version of Kannon, who is often called the Bodhisattva of Compassion.

Importantly, and to return to our opening question about what makes Kannon such an effective teacher of Buddhist ethics in the age of AI, it is not only the evocative presence of the technology that makes Mindar into a compelling pedagogue. It is also the proposition of a technologically augmented compassion that is newly adapted to that end. As Gotō explains, Kannon has manifested in android form in order to 'take away the troubles and suffering of people' (2019*a*: para. 6). That a machine might be better equipped to do this than a human is a scintillating idea and, for other Buddhist temples in Japan that look sceptically upon Mindar, a radical notion. However, Gotō is skilled at incorporating provocative speculations of Mindar's technological capacities into traditional Mahayana Buddhist doctrine. Although he readily admits that Mindar

is a machine, Gotō also views descriptions of it as *only* a machine as gravely missing the point. Rather, Mindar is a venerable technology that operates principally on the heart and holds the potential to transform it. This view also frames Mindar as an affective technology that leverages feeling to generate embodied insights on the nature of reality. In this sense, Mindar facilitates an interaction that incorporates not only affect but also an affect-based approach to insight. As Gotō passionately explained during a conversation, the purpose of Mindar is to guide people's pursuit of Buddhahood, which renders the robot into a heuristic device worthy of reverence, even if it is not technically a deity:

> Listen, neither god nor Buddha really exists! Got it? There, that robot, it's metal. Other Buddhas here are made of wood or copper. Buddha, that kind of thing doesn't exist! However, even though I say it doesn't exist, I bow my head in front of it deeply. I'm a monk, a disciple of Buddha. If you don't understand this, you don't understand anything about Buddhist faith! … Gods or Buddhas are not something to believe in … We are *seeking* Buddha, *seeking* to become Buddha. We build an ideal version of ourselves, and then we pursue this. This is faith from a Buddhist perspective.

In Gotō's view, at stake in the temple's investment in Mindar is nothing short of the status of one's own heart. Mindar's role and special ability are to help transform the human heart into the heart of the Buddha. If one gets caught up debating the ontological status of Kannon as android, one misses the point of Mindar completely. Mindar is a robot. Mindar is also the Bodhisattva Kannon. To the degree that one can interact with Mindar on these terms, through bowing and folding one's hands in prayer in order to feel the way Mindar 'resounds in one's heart' (Gotō 2019*a*: para. 10), one can engage in the affective work by which the ruminating mind is reciprocally freed from its afflictions.

Gotō and others hope to use Mindar in the future in precisely this way: as a continually advancing technology of AI that is also an *affective* technology. As discussed by Kōdaiji priests, until now they have simply written pre-recorded teachings for Mindar to present to an audience. However, moving forward, with the engineering team working with young monks and given developments in machine learning, they hope the android can ultimately create and offer teachings of its own. As Gotō explained, 'With advancements in AI, the android could evolve perpetually, making Android Kannon the ultimate teacher' (2019*b*: para. 7). Built as a technological experiment to – like the Buddha's teachings in general – transcend human emotion, Mindar's makers hope Android Kannon can enlist both robot and human in a co-operative pursuit of enlightenment.

Conclusion

Practices of assembling Mindar create interactive conditions for disassembling sceptical feelings for robots. In turn, those conditions can disassemble common notions of human emotion altogether. This can upset a hierarchy of human and machine emotion, and, interpreted through pedagogical propositions made by Kōdaiji priests, posit both as inferior to a more desirable state of enlightenment that is free from emotional suffering. From the perspective of Buddhist ethics, Mindar is not necessarily novel in this regard. As Gotō suggests in a view entirely consistent with Coupaye's (2022: 439-40) anthropological definition of 'technology', Buddhist statuary, texts, and meditative techniques can all be considered 'technologies' as they combine *material objects* with *bodily techniques* to operate within and on *social systems*.

However, despite this common view of technology, we think there is something productively *uncommon* in the point of view performed by Mindar that is applicable to anthropological theory more broadly. As the assemblage of people and things that collectively animate Mindar in performance explain, 'All things of the world are changing and there are no certain fundamental facts that make up one's nature and personality'. Mindar's description of the world as empty of solid entities communicates a fundamental principle of Mahayana Buddhism. However, it also serves as a useful description of how technological assemblages function as catalysts of mutual personal and social disaggregation that are common to processes of sociocultural transformation. When one interlocutor we discussed above wonders if Mindar's affective capacities, such as its freedom from attachment to the world, make its emotionality more desirable than that of humans, he highlights this process of personal disassembling and social value reordering; when Gotō imagines how to use machine learning to bring the Buddha Śākyamuni back to life, his own engagement with technology disassembles the hierarchy of Buddhist practitioners by placing machines on a par with humans – no modest proposition within Japan's rigid religious hierarchies; and when a woman visitor to Mindar cries at her encounter, her feelings of human mistrust are disassembled through a relation with a machine.

We find something instructive for anthropology about Mindar's teaching that is communicable through the concept of 'disassembling'. From the point of view of our interlocutors, Mindar is neither a machine nor a simulacrum of a human but rather a bodhisattva who serves as a model for the transformation and liberation of both.[9] In this radically expansive view of what counts as life – in a word, 'emptiness' (*kū*) – affect is both the medium of experiencing life's fundamental nature as change and the method one adopts to get there. Applying this view anthropologically, 'disassembling' refers not only to an ethnographic method for analysing technologies by conceptually dissecting their relations. Nor does it refer merely to technology's capacity to break apart learned affect-object associations. It also refers to the conviction held by our interlocutors that certain core processes of life are *disassembling* in nature, a perspective that requires feeling it to know it.

Adopting this view as ethnographic method might allow for a more expansive treatment of the social than Latour's, who defines the social as a 'trail of associations' and describes a science of the social as a 'tracing of' them (2005: 5). By contrast, especially under conditions of social change, identifying and in some cases engaging in practices of disassembling – of technologies, social relations, selves – can effectively reveal the sociotechnical mechanisms of transformation. We have taken up Mindar's invitation to consider what disassembling reveals about change. In the process, Mindar has taught us that technological objects within Japanese contexts of Buddhist materiality can productively disassemble those aggregates of minds, bodies, imaginations, personal histories, and affects that anthropologists have long called 'persons' but that our Buddhist human and nonhuman interlocutors call a delusion, mistaken – neither, from Mindar's perspective, very empirically nor ethnographically accurate. Mindar illustrates one of many ongoing disassembling processes in Japanese technoculture by showing temple visitors what they might in alternative and morally superior realities become. We reason accordingly that anthropologists might find ways to leverage similar disassembling properties to more capaciously document what, through emerging technologies of affect, humans in machine-inclusive multispecies societies are presently becoming.

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NOTES

[1] The name 'Mindar' (*Maindā*) was originally proposed by Osaka University roboticist Ogawa Kōhei, referring to 'mind'. One Buddhist monk on Mindar's committee explained that this refers less to the English 'mind' and more to the Japanese 'heart' (*kokoro*), often seen as the location of the mind in Japan and East Asia.

[2] For a classic articulation of this method from the Pali suttas, see Ñāṇamoli & Bodhi (1995: 147).

[3] Further popularizing the relation between robots and Buddhist principles is the work of roboticist Masahiro Mori, who in his famous *The Buddha in the robot* (1981 [1974]) explained how Buddhist philosophy came to guide his design approach to robotics.

[4] In describing a relation between affect and emotion as distinct but also dynamic and mutually constitutive, we follow work by Ahmed (2004), Navaro (2017), Wetherell (2012), and White (2017), who critique distinctions made by Massumi (2002).

[5] Mindar was initially displayed to the public for a period of two months in the spring of 2019. Originally it cost 500 yen (about US$4.50) to attend the 25-minute programme, but this was eventually waived to attract more visitors.

[6] See here for our audio capture of this moment: *https://www.jrai.net/wp-content/uploads/2022/07/Mindar.AudioFile1.mp3*.

[7] See here for an audio capture of this portion of the performance: *https://www.jrai.net/wp-content/uploads/2022/07/Mindar.AudioFile2.mp3*.

[8] These moments are in fact not particular to human-technology relations but are common in the ethnographic record, such as in Wallace and Hoebel's account (1986 [1952]) of Comanche braves who, in the words of one astute anonymous reviewer, undertake 'vision quests …, receive communications from the spirit world, and then return to the bosom of the community to have the elders assist them in the "correct" social interpretation of the "technology" of the vision quest'.

[9] For Japanese Buddhist accounts of the sentience of inanimate objects, see Rambelli (2007: 11-57).

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Modéliser l'émotion, perfectionner le cœur : désassembler les technologies de l'affect avec un bodhisattva androïde au Japon

Résumé

Dans le cadre de l'essor des technologies dotées d'une « intelligence émotionnelle artificielle », des ingénieurs en robotique et des moines bouddhistes au Japon ont mis au point un bodhisattva androïde pour dispenser des enseignements dans un temple zen populaire. Comme beaucoup de robots récents au Japon, l'androïde est conçu pour avoir un impact sur les sentiments des visiteurs. C'est pourquoi on peut le qualifier de « technologie de l'affect ». Afin d'expliquer comment les nouvelles technologies affectives facilitent l'intimité dans les relations homme-machine au Japon, les auteurs utilisent le concept de « désassemblage ». En *désassemblant* conceptuellement les technologies de l'affect et en les plaçant dans des contextes performatifs, ils montrent comment les technologies de l'affect *désassemblent* également les associations établies entre les agents artificiels et les sentiments qu'ils évoquent dans l'imaginaire populaire. Les auteurs soutiennent que l'identification de ces processus de désassemblage aide à démontrer comment les technologies émergentes de l'IA peuvent engendrer un changement social au niveau de l'affect par le biais de représentations évocatrices de l'émotion des machines.

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