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Internet of Bodies, datafied embodiment and our quantified religious future

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This article discusses the datafied embodiment of the Internet of Bodies (IoB) technology by applying the methodology of postphenomenology. Firstly, the author claims that the boundaries of dual distinction between real and virtual, online and offline, and embodiment and disembodiment have become increasingly blurred. Secondly, the author argues that postphenomenology can help us to study today's emerging technologies' mediating role in human–world relations. Thirdly, the author analyses the implication of embodiment from phenomenological and postphenomenological perspectives and then demonstrates in what sense the data collected from the IoB devices can constitute our embodiment and selfhood. Fourthly, the author elucidates how the IoB devices are datafying our bodies and the whole lifeworld and how these devices mediate and transform our religious practices and experiences. Fifthly, the author points out that the Quantified Religion as the possible new religious model would smooth out the differences and diversities between religions and then create homogeneous religious data selves, which will mediate, reshape, constitute and even replace our physical selves. Ultimately, the author argues that responsible designing of the IoB devices and establishing the ownership of personal religious data can be seen as significant measures in the face of the risk of our quantified religious future.

Contribution: This article contributes to understanding the potential religious transformations caused by the IoB technology. This article analyses the mediating role the IoB technology plays in the relationship between humans and the world through a postphenomenological perspective, thereby explaining how body data harvested from the IoB devices can datafy and constitute our embodiment and selfhood. The article argues that the Quantified Religion as a new religious model will emerge in the future IoB era, and it will mediate, constitute and shape our religious practices and experiences through personal data harvesting and analysis.

Keywords: Internet of Bodies; datafied embodiment; datafication; data selves; postphenomenology; religious practices; spirituality.

Introduction

Technologies play significant roles in contemporary societies, and today's philosophers of technology have analysed how technologies mediate our perceptual experiences, behaviours, actions and moral affairs (Ihde 1990, 2009; Verbeek 2005, 2011). Undoubtedly, religions as non-negligible affairs are also influenced and shaped by technologies. For example, the Internet has changed the manner and contents of religious practices; various online religious communities have facilitated and deepened interfaith interactions and dialogues. During the last two decades, various studies have discussed whether the Internet can promote our daily religious activities and experiences (Anderson 2021; Campbell 2010; Dawson 2005; Dawson & Cowan 2004; George 2006; Smołucha 2017).

Obviously, the above debates have presupposed a dual distinction between real and virtual, online and offline, and embodiment and disembodiment. However, with the rapid development of technology, such as artificial intelligence (AI), virtual reality and augmented reality, the boundaries of dual distinction have become increasingly blurred. As Hine (2015) argues, the Internet is a cultural site already embedded in various contextualising frameworks, systems and artefacts; our experiences of using the Internet are embodied, and gradually constitute our everyday lives. Thus, for Hine, the Internet is always embedded and embodied in our lifeworld and constructs our daily *status quo*.

Accordingly, we can no longer make that distinction because our world is always mixing virtual and real (Gasser 2021; Radde-Antweiler 2022). Moreover, this hyper-real world has significantly

impacted our daily experiences, psychological activities and social behaviours; indeed, the effect of the virtual environment is more lasting and dramatic than in the real physical world. For example, Radde-Antweiler (2022) mentions that virtual sexual harassment and rapes have always been accompanied by the development of virtual environments. Although players in video games control their avatars to invade and harass other players' avatars virtually, and the physical bodies of other players are not physically harmed, other players are left with the persistent mental and psychological damage that can lead to a series of physical symptoms; on a societal level, it can also lead to actual crimes. In this sense, it can no longer be said that the virtual environment is detached and disembodied.

Therefore, we need to ask to what extent religious practices and experiences are mixed with material and technological elements, and to what extent do material and technological elements mediate and transform people's religious practices and experiences. Suppose the Internet and AI can enhance people's cognition (Voinea et al. 2020) and morality (Klincewicz 2016; Lara & Deckers 2020) in a real sense, then the Internet's and AI's impacts on people's religious lives are also evident and unquestionable. Hence, the religious studies of emerging technologies need to move beyond the binary arguments between real and virtual, online and offline, embodiment and disembodiment and then explore how material and technological elements participate in our lifeworld and mediate, constitute and determine our spiritual religious activities. As Meyer et al. (2010) argue that:

> [A] materialized study of religion begins with the assumption that things, their use, their valuation, and their appeal are not something added to a religion, but rather inextricable from it. (p. 299)

In this paper, it is necessary to clarify the mediating and transforming roles of technologies on religious experiences and practices on the one hand, and also necessary to clarify the datafied processes of religious experiences and practices on the other hand. That is, technological artefacts can not only be worn, ingested and embedded as a part of our bodies, but also can quantify our physiological and psychological activities in a datafied way through harvesting body data from the artefacts we wear, ingest and embed. Thus, the data harvested from our everyday body-centred mignon artefacts leads to the dramatic growth of datafication in all aspects of our daily lives, including the religious and spiritual domains (Cheong 2020:397). In this sense, not only the body-centred mignon artefacts are embodied through wearable, ingestible and embeddable ways, but also the body data harvested from these artefacts are also embodied through influencing and reshaping people's habits and actions.

Now, the body-centred and Internet-connected artefacts, including the wearables, ingestibles and embeddables, have a common name: the Internet of Bodies (IoB). Undoubtedly, the IoB technology will sooner or later open a new Internet era, that is, the era of the IoB. In this article, the author will demonstrate how the IoB technology will transform our religious practices and experiences, and what will be the consequences of the datafication of our religious practices and experiences. And then, the author will assert that the IoB will switch on a new religious model, that is, the Quantified Religion. And then, the author will elucidate how the Quantified Religion will pose a challenge to spirituality and traditional religious practices. Ultimately, being responsible for designing the IoB devices and establishing the ownership of personal religious data can be seen as significant actions in the face of the risk of our quantified religious future.

Methodology: Postphenomenology

The methodology the author would like to apply in this study is called postphenomenology. The term 'postphenomenology' was launched by Don Ihde, an American philosopher of technology. According to Ihde, postphenomenology can be seen as a 'nonfoundational' phenomenology which is different from, but owing to its ancestry (Ihde 1995:1). That is, postphenomenology is more akin to American pragmatism rather than its European transcendental style. Thus, postphenomenology, on the one hand, inherits the basic concept and framework of phenomenology, which emphasises the significance of the lifeworld and pays attention to our *being-in-the-world*; on the other hand, postphenomenology rejects the monolithic and romantic views of technology, which is alienating the relationship between humans and the world. Accordingly, postphenomenology aims to investigate how technologies actively mediate and constitute the relationship between humans and the world rather than criticise 'TECHNOLOGY' as a whole. In this sense, Ihde argues that technologies play a mediating role between humans and the world and actively constitute humans' experiences and actions; Ihde then develops four types of human–technology relations, that is, embodiment relation, hermeneutic relation, alterity relation and background relation, and in each relation, technologies actually mediating and constituting humans' experiences and practices (Ihde 1990:72–112). For example, the glasses we wear play a mediating role between humans and the world; they transform our naked eyesight into mediated brighter eyesight without our awareness unless the glasses suddenly break; thus, the glasses present the embodiment relation of human–technology.

Accordingly, postphenomenology as an empirical approach contains a series of concepts used to describe human–technology relations, such as intentionality, embodiment, transparency and mediation. These concepts help avoid the pitfalls of determinism and instrumentalism (Aagaard et al. 2018:xiv–xvi). That is to say, technologies cannot be seen as mere tools whose functions are totally determined by designers and users but be seen as active agents who engage in human affairs and help people to make moral decisions (Verbeek 2011:21). For example, the obstetric ultrasound creates an emotional connection between parents and the unborn infant through images; hence, the ultrasound mediates the relation between parents and the infant, and helps people to make moral decisions (Verbeek 2008).

Moreover, according to Dorrestijn and Verbeek (2013), technologies can persuade, nudge and shape people to do specific moral actions and behaviours. For example, speed bumps on the road force drivers to control their speed while driving, as if they 'persuade' drivers to behave in accordance with traffic regulations. Consequently, for Verbeek, technologies as moral mediators constitute a hybrid relation between humans and nonhumans, so 'moral actions and decisions are the products of human-technology associations' (Verbeek 2011:53).

Subsequently, postphenomenology as a methodology of doing ethics indicates that morality is not a purely spiritual domain but a hybrid affair mixed with the elements of humans and things. Thus, designers can assign specific moral values to technological artefacts, thereby persuading, nudging and shaping users' behaviours and actions to conform to moral norms.

In brief, postphenomenology as an essential methodology in the field of philosophy of technology 'has developed a unique set of insights into technology, and applies these ideas to practical cases of usage, design, policy, and scientific research' (Rosenberger & Verbeek 2015:2). In this sense, postphenomenology can also be applied in the field of religious studies in order to clarify the technologically mediated religious experiences and practices, thereby manifesting how technologies participate in religious activities and reshaping people's religious actions and spirituality. Moreover, as a contemporary technology with excellent development potential, the IoB can mediate and shape users' religious experiences, actions and spirituality through data harvesting and analysis. That is to say, just like morality, religion is also a hybrid affair mixed with the elements of humans and technologies. By applying the methodology of postphenomenology, we will gain a deeper understanding of the technological components of religions.

The Internet of Bodies technology and the potential transformations

With the enlightenment of postphenomenological methodology, the IoB technology is a technological mediation that mediates and constitutes the relationship between humans and the world. Naturally, the IoB technology will cause profound transformations not only in the social domain but also in the religious domain. In order to deeply study the potential transformations of the IoB technology, we need to review its current development.

In general, the IoB is a new type of technology that has emerged in the last 5 years; it can be seen as part of the 'Internet of Everything' through its manifestation as wearable, ingestible and embeddable devices. Therefore, it can be regarded as an upgraded version of the Internet of Things (IoT). Currently, the IoB technology is receiving increasing attention in many countries worldwide, and the market potential is significant. A report predicts that the IoT

(including the IoB) devices in the healthcare market will grow to $446.52 billion in 2028 (Tsymbal 2022). In 2020, the World Economic Forum and the Land Company from the USA released a series of research reports revealing that the IoB technology will cause wide-ranging changes in the medical, education, finance, law, defence and military fields and will also cause severe challenges to traditional governance models (Lee et al. 2020; World Economic Forum 2020). For example, Khokhlov and Belousov (2021) argue that medical IoB devices bring benefits to health care and treatment on the one hand and also bring a series of ethical risks, such as hacking, malfunctioning and invasion of privacy, on the other hand. There is also a news tale indicating that medical IoB devices can be hacked by terrorists and shock a patient's heart.

In 2007, Dick Cheney (the Vice President of the USA at the time) asked doctors to turn off the Internet signal of his pacemaker because he feared that terrorists would invade his pacemaker's network system and fatally shock his heart (Sen, Maity & Das 2020).

This news story vividly illustrates the potential risks of the medical IoB devices; if patients' bodies can be connected through the Internet, then not only the body data harvested from the IoB devices can be hacked by others, but also surgery or other treatments can be controlled by hackers, who can even attack patients' bodies directly by controlling the Internet signals. This situation is not only a privacy violation but also involves a criminal crime that has never been committed before, which is bound to trigger a series of changes in the medical, social and legal systems.

Moreover, other scholars, such as El-Khoury and Arikan (2021) and Matwyshyn (2019), both of them worry that the IoB devices will affect the legal constructs of ownership and privacy and lead to legal transformations for better or worse. There is also a news tale about the legal challenges of the IoB technology.

In 2016, the house of Ross Compton, a resident of Ohio, caught fire, and he packed a few bags before breaking a window and escaping; however, the police soon began to suspect that he had deliberately set fire to defraud insurance based on the heart-data evidence from the pacemaker he had implanted (Gardner 2020).

According to this news tale, can the police use personal data harvested from personal IoB devices as legal evidence? If the answer is yes, then any personal data do not fall within the scope of personal privacy and is not the property of individuals but belongs to public interests for the sake of policing and public health. This will pose a challenge to the current legal framework, which will constitute a profound transformation in law and society.

The above studies and stories imply that what the IoB technology achieves is the interlinking effect on our bodies,

body data, applications and databases. Thus, our biometrics, such as heart rates, body temperatures, visceral activities, among others, can all be tracked, harvested, analysed and predicted by the IoB technology we wear, ingest and embed. From a postphenomenological point of view, as the author argued in the previous section, the IoB technology and the body data it harvested can mediate between humans and the world and then constitute, transform and shape our everyday lives for better or worse. Sequentially, suppose the IoB technology and the body data harvested from it have become an integral part of our daily lives, then what is the characteristic of the embodiment of the IoB technology and body data? Furthermore, how this sort of embodiment will make a remarkable transformation in religious experiences and practices?

To answer the above questions, we need to clarify the concept of embodiment under the light of (post)phenomenology.

The embodiment issue in (post) phenomenological perspectives

As mentioned in the methodology section, postphenomenology mainly aims to investigate the relationship between humans and the world, and technologies play a significant mediating role in the relationship. Therefore, the concept of embodiment, as an essential description of this relationship, allows us to see the basic state of the entanglement between humans and technologies today. The issue of embodiment, moreover, derives from the phenomenological tradition of Husserlian distinction between *Körper* and *Leib* (Taipale 2014:13). The former term, *Körper*, refers to the [objectifying body or the physical body], which is a mere thing and separate from the mind; the latter term, however, refers to a phenomenal body or a lived body living-in-the-world, which can be seen as an overcome to the Cartesian mind–body dualism. Thus, the lived body [*Leib*] entails the characteristic of embodiment because it constitutes our subjectivity, intersubjectivity and lifeworld (Taipale 2014:14).

Husserl's followers inherited his ideas on embodiment and went further than he did. Heidegger explicitly links the issue of embodiment to technologies; he distinguishes two conditions of *present-at-hand* and *ready-to-hand* when we use a hammer, for example (Heidegger 1962:97–101). In the former state, the user treats the hammer as a tool in her or his hand, she or he 'grasped thematically as an occurring thing', while in the latter state, the hammer is no longer a tool, but rather 'withdraws' into her or his own body; that is, she or he does not grasp it thematically as a mere tool, but skilfully coping with the world by it without thematic notice, unless the hammer suddenly breaks. It is in this latter sense that we can say the hammer is embodied. In fact, Heidegger's question concerning technology opens up a possibility to reflect human–technology relations with a phenomenological approach, and the phenomenologists and postphenomenologists of later generations are all carrying out their respective discussions on human–technology relations based on Heidegger.

Similar to Heidegger, Merleau-Ponty continues the significance of embodiment in his magnum opus, *Phenomenology of Perception*. For Merleau-Ponty, we say a technological artefact (such as a cane) is embodied not only because it incorporates into the user's body schema, thereby expanding the scope of the user's perception (Merleau-Ponty 2012:144), but also because it constitutes certain habits of the body and then projects a cultural world by the body (Merleau-Ponty 2012:148); this is what Dreyfus and Dreyfus call 'cultural embodiment' (Dreyfus & Dreyfus 1999). Thus, embodiment is relevant not only with bodily perceptions but also with the technological, cultural, social and customary contexts in which the body dwells, no matter whether we are aware or not.

Postphenomenologists, like Ihde and Verbeek, as mentioned above, inherit the fundamental concepts of phenomenology, such as embodiment and intentionality, and emphasise that technologies constitute our subjectivities and intersubjectivities, and technologies become an inherent part of our lives as if they have intentional agency (Verbeek 2011:9). Thus, embodiment is more intimate to technological design and use, that is, when we say a particular technology is embodied, it signifies that the technology reshapes our physical appearances, lifestyles, living experiences, actions and moral decisions.

From the above analysis of embodiment under the light of (post)phenomenology, as Ihde argues in *Bodies in Technology*, there exist two types of bodies: 'body one' is a passive body that is constructed by cultures, powers and disciplines; 'body two' is a positive, constituting body that is motile, perceptual and emotive (Ihde 2001:xi). Corresponds to two types of bodies, the author argues that there are also two types of embodiment; cultural embodiment implies that the social and cultural environment people dwell in become an integral part of people's lives; people actually identify with the social and cultural values that shape them through acquired learning; and motile embodiment, on the contrary, through the initiative to innovate, design and use things not only make things become an integral part of one's own, but also extend and enhance one's bodily abilities. Furthermore, the technological dimension, as Ihde argues, traverses both types of bodies (Ihde 2001:xi) and both types of embodiment. That is to say, on the one hand, people have to accept and be shaped by the technological environment in which they live; on the other hand, people also can create and use new technologies, improve and enhance their capabilities through them, thereby innovating and constructing new social interaction patterns. Hence, in these two intersecting types of embodiment, technologies become an indispensable part of our daily lives. That is, from the perspective of (post)phenomenology, technologies are both constructing and being constructed, constituting and being constituted.

Human-data assemblage and the datafied embodiment

Due to the above analysis, both in phenomenological and postphenomenological approaches, embodiment is a description of human–technology relations. Thus, we say a technology is embodied because it mediates and constitutes our actions, experiences and even moralities on the one hand, and we, the people, also actively design and use it to achieve our goals and purposes on the other hand. Now, how do we define our relationship with the IoB technology? Is it still possible to depict the relationship between humans and the IoB technology in terms of two types of embodiment, as I analysed above?

Obviously, the IoB technology has a very tight relation with our bodies because they are all presented as *ready-to-hand* (i.e. transparency) in our daily lives in wearable, ingestible and embeddable manners. According to Pedersen and Iliadis (2020), today's wearable, ingestible and embeddable devices can all be seen as embodied computing devices because they are body-centred and try to redefine humans as sources of body data. Then the body becomes a platform for data generating and communicating. Through collecting and analysing body data, these devices automatically track and predict humans' locations, behaviours, emotions, mentalities and health conditions. Not only our whole lifeworld is datafied by these devices, but also these devices reshape our daily habits and lifestyles.

That is to say, the embodiment of the IoB technologies is still presented in two types. In the sense of cultural embodiment, the ubiquitous IoT and IoB technologies actually constitute our lifeworld and construct an innovative technological environment we are immersed, thereby forming our daily habits and lifestyles; in the sense of motile embodiment, on the contrary, we actively innovate, design and improve certain usages and conveniences of the IoT and IoB technologies, thereby allowing technologies to perform functions and tasks we assign to them. However, a specificity exists in which the embodiment of the IoB technology differs from other embodied technological artefacts. The specificity lies in the fact that the IoB technology has continually transformed, constituted and shaped experiences and behaviours by tracking, collecting and analysing body data; meanwhile, people can also improve their physical performances by self-tracking their body data, thereby forming a more precise and more comprehensive understanding of themselves. In this sense, both the technology and body data play mediating roles between humans and the world. Body data, then, is not a passive digital thing that merely presents the objective states of our bodies but rather a positive and constitutive mediator mediating and shaping our self-understandings, experiences and actions, as well as helping us make policies and decisions. Accordingly, the embodiment of the IoB technology also indicates the embodiment of body data.

Recently, several studies have shown how body data has become an integral part of our daily lives and even constitutes our subjectivities and intersubjectivities. For example, Ruckenstein and Pantzar (2015) argue that personal data harvested from self-tracking devices can translate people's selves into engaging and actionable formats, thereby forming the quantified selves that people automatically transform their own lives into a set of numerical phenomena. Coincidentally, Cheney-Lippold (2017) asserts that we become data because we are classified by the data and thereby forming our algorithmic avatars, and our online identities and activities are determined by them. Furthermore, Bergroth (2019) claims that data collected from self-tracking devices can deepen our understanding of ourselves, leading to distress and anxieties about the abnormal data states of our bodies.

Thus, data in fact, constitute our identities, experiences, emotions and actions.[1] According to Lupton, the data have a fourfold characteristic. Firstly, data have their own social lives and circulate in the field of digital and datafied economy; secondly, data constitute our knowledge and deepen our understanding of ourselves and each other; thirdly, data have an impact on our lives and shape our decisions and actions; fourthly, data can form our livelihood and construct informational businesses (Lupton 2020:6). From these four listed dimensions, our daily lives and social interactions are datafied by the ubiquitous IoT and IoB technologies. As Cukier and Mayer-Schoenberger (2013:29) argue, datafication signifies the 'ability to render into data many aspects of the world that have never been quantified before'. Thus, the datafication of our lives and social interactions signifies that data become an integral and embodied part of our lives; datafication can then be understood as a new type of embodiment because people perceive the world not only by bodily perceptions but also by body data, which is more comprehensive and accurate than bodily perception. That is to say, we have already become a 'human-data assemblage', and data achieve a new form of embodiment and selfhood (Lupton 2020:79). This new form of embodiment can be called 'datafied embodiment' (Lupton, Clark & Southerton 2022). For Lupton, datafied embodiment implies that data are not a mere thing but is 'lively'; it is always intertwined with our bodies and determines our lives, life chances and opportunities (Lupton 2016:44). It is in this sense that we are all 'data selves', because we live with and through our body data (Lupton 2020:6).

Hence, when the IoB technology is ubiquitous and permeating every corner of our daily lives and social interactions, then

1. I have also experienced an empirical example of how data can determine our daily lives. Last year, Shanghai was suddenly shut down because of the coronavirus disease 2019 (COVID-19) pandemic and the zero-COVID strategy. Almost all Shanghai citizens have to get nucleic acid tests, and the data results of the tests shown on their smartphones determine whether they should go to quarantine. After a 3-month-long lockdown, Shanghai was reopened, but citizens began to be anxious about whether they had been tested in time to keep their data results valid within 72 h, if not, their health code would change from green to yellow, meaning no access to public places and public transport until the yellow code turns green. Every morning, the first thing commuters need to do is to check whether their test data results are valid, if not, they must go quickly to find a place to do a new test. Almost the whole year of 2022, Shanghai's social norms are constructed by data, and citizens have spontaneously developed their self-tracking habits. Therefore, data, in fact, can influence, constitute and even determine our identities, experiences, emotions, habits and actions.

our embodiment is also datafied by the technology. Undoubtedly, the relation between our bodies and the IoB technology, whether wearable, ingestible or embeddable, can all be depicted as the relation of datafied embodiment.

In my opinion, the embodiment of the IoB technology is presented in three types. Cultural embodiment depicts the IoB technology that constitutes social, cultural and technological contexts we dwell in, and our lifeworld is actually shaped by the technology we wear, ingest and embed. Motile embodiment manifests that we can actively design and improve certain functions of the IoB technology, thereby performing certain functions and helping us accomplish a series of tasks we assign to it. Datafied embodiment traversing cultural and motile embodiment has the characteristics of these two types. It signifies that data, on the one hand, constitute our lifeworld and shape our experiences, emotions and action; on the other hand, data lively participate in and become an integral part of our daily lives; we depend on data for a better life and pursue higher data goals of our lives, thereby cultivating our self-tracking habits as autonomous and rational practices which can help us deepen the understandings of ourselves and enhance our capacities and fitness (Lupton 2020:84).

Because datafied embodiment can comprehensively depict the relationship between humans and the IoB technology, how datafied embodiment of the IoB technology shapes our religious experiences and practices? Will different sorts of the IoB technologies present different levels of datafied embodiment? In the following parts, the author will respectively discuss the datafied embodiment of wearable, ingestible and embeddable IoB technologies and then illustrate how these technologies will transform our religious practices and experiences.

Datafied embodiment in the wearable Internet of Bodies devices and its potential religious transformations

Wearable devices such as smartwatches have been used for many years and may be the most popular technological form of the IoB. The wearables often detect and track users' biometrics, thereby reshaping our daily habits and social orders.

A qualitative study shows that users barely feel their presence when they get used to the wearables. Some users claim that the device 'felt like part of their body'; furthermore, the authors found that the wearables can decisively change users' habits and constantly urge users to exercise daily to meet the health data criterion (Nelson et al. 2020). Another study shows that the self-tracking habits of users formed by the wearables also lead to severe distress and anxiety when specific body data change (Bergroth 2019). This indicates that if the wearables can measure selves, our selves inevitably become unstable and fluid, moving with time; after that,

selves can be regarded as a process of changing, and no stable identities will keep in this wearable technological context users dwell in.

Obviously, one of the wearables' primary functions is time-tracking, thereby recording users' real-time body data. Suppose users' real-time body data can connect to the Internet and upload to a public database for all users to view. In this case, users' average data standard will be automatically generated according to the algorithm and nudging data competition among users. For example, suppose an Internet-connected fitness bracelet can record the real-time footsteps we exercise and then upload data to the public database, the fitness application (app) will recommend a mean value for daily exercises, and users who can achieve this mean value will be rewarded with scores. If this situation happens, it will encourage users to engage in exercises. However, it will also increase futile competition, leading to higher average scores and frustration for those who cannot meet the average scores.

Moreover, recent studies found that the wearables can collect health data and quantify our psychological and spiritual states, thereby promoting people's happiness and empathy (Rojas et al. 2020; Yano et al. 2015). These studies imply that both physical and psychological activities can be datafied through wearables, so any mental state can be quantified; just like fitness bracelets collect users' exercise data, it will gradually form a set of data standards on mental health.

Accordingly, the wearables can persuade and nudge the users' behaviours through data representation and set a data standard, creating a series of norms about how to live a normal and happy life. That is to say, the wearables can datafy our bodies, mediating our behaviours and actions and transforming our living habits, lifestyles, social interactions, as well as our mental states.

Suppose the wearables can datafy and mediate users' physical and mental activities such as exercise, sleep, happiness and empathy, why cannot they quantify and regulate believers' religious practices, spirituality and religiosity? For instance, we can use smartwatches or wristbands for religious purposes. We can self-track our biometrics, such as heartbeats, pulses and breathing on the one hand, and then compare these biometrics at different times and under different circumstances, thereby presenting different data classifications in different religious practices, such as worships and meditations; we can also datafy and track our mental states such as happiness, empathy and peacefulness on the other hand, in order to examine whether we have reached certain spirituality or whether we are religious enough.

If the wearables can achieve the above two self-tracking aspects, the religious activities and spirituality will be mediated and enhanced through them, then the endless self-tracking practices will form different data standards for different religious practices and spirituality, and then leading to endless religious competitions. Therefore, the believer's

concern, however, is not the pure spirituality they acquire through religious practices but whether their religious practices and spirituality conform to specific data standards. And our religious experiences would also be transformed from certain somatic and psychic peaceful conditions into certain quantitative and homogeneous data traits.

Consequently, the IoB wearables accomplish the datafied embodiment through harvesting and detecting our physical and mental biometrics, establishing a series of data classifications for our religious practices, experiences and spirituality.

Datafied embodiment in the ingestible Internet of Bodies devices and its potential religious transformations

According to Ray (2020:19), the ingestibles are an enhanced and emergent version of the wearables. Unlike the wearable devices, which are attached to the surface of the human body, the ingestibles can directly access the gastrointestinal tract, monitor, visualise and datafy visceral activities, such as gastrointestinal diseases, stomach fluids and acidity. Thus, the datafication of internal bodies becomes visible and transparent. Thereafter, the datafied embodiment of the ingestibles manifests that our bodies can be internally datafied, and then we will seek the meaning of life regarding the total datafication and transparency of our internal bodies. According to Iliadis (2020), the ingestibles as a sort of 'inside out' technology that not only enhances and datafies our visceral activities but also enhances and datafies our intelligence (such as nootropics) and surgical practices (such as microbots).

One of the most mature ingestibles is the digital pill. A digital pill can digitalise and datafy our visceral activities (e.g. the acoustic wave of the gastrointestinal tract, heart and repertory rates). When patients take this kind of smart medicine, the data of visceral activities are generated and automatically uploaded to the patients' mobile application; hospitals and manufacturers often have access to the private data. That is, the digital pill 'translates' invisible visceral activities into quantified data and transparent images, guiding users on keeping fit and instructing doctors on how to treat illnesses. The totally datafication lets our bodies 'inside out', and it would become a main paradigm for contemporary technological societies. Additionally, datafication mediates and reshapes users' actions, behaviours, habits and lifestyles and translates users' internal bodies into quantified, uniform, averaged and calculable data.

Similarly, the ingestibles would also have an enormous potential for religious purposes. On the one hand, the ingestibles can enhance believers' mental states and physical conditions (such as smart drugs and psychedelics that enhance mental and physical strength), and these make it easier for believers to be immersed in a particular mental and physical state for a long time (such as prayers and meditations); on the other hand, the ingestibles can datafy believers' visceral activities, to provide data basis for believers' religious habits and actions. A recent study mentions that the ingestibles now can monitor users' digestive gases, thereby understanding the amount of fibre in our daily diet (Ray 2020:20); in the foreseeable future, the ingestibles will be able to analyse our food and nutrients, provide us with healthy dietary data, thereby regulating and transforming our eating habits and behaviours. Considering that many of the world's religions have special dietary requirements for their followers, the ingestibles will play a considerable role in religious transformations. For example, for Mahayana Buddhists, 'cut out meat' is the essential commandment; so, suppose the IoB ingestibles can datafy believers' gastrointestinal activities and the nutritional contents of believers' eats. In this case, it will gradually lead to a data standard for the eating norms of Mahayana Buddhists, so much so that the IoB ingestibles can monitor each meal of Mahayana Buddhists and convert nutritional intake into data. Thence, data will be the only strict criterion for determining whether a believer obeys the commandments. Then, dietary self-tracking will become a daily task for believers regarding whether they obey religious rules.

Moreover, as Ray shows in the report, the ingestibles need accurate localisation in users' gastrointestinal tract in order to enable more effective monitoring and treatment (Ray 2020:21). For religious usages, let us imagine that on the one hand, the ingestibles allow believers to locate them in believers' bodies, thereby collecting dietary data accurately for religious purposes; on the other hand, believers can be located by the ingestibles they take, then believers' data of geolocations can be automatically uploaded into a religious public database in order to monitor and supervise whether believers attend churches or mosques and worship on time. If this scenario happens, tracking geolocations can be an excellent way to motivate believers to follow religious norms and remind believers to attend rituals on time. However, if the ingestibles can unlimitedly track our diets and geolocations, then data monitoring and privacy disclosures will inevitably occur, challenging our traditional religious and moral values and then establishing new models of social interactions.

Consequently, the datafied embodiment of the IoB ingestibles achieves the total datafication of our bodies, giving meaning to the spontaneous and invisible visceral activities. Thus, tracking and datafying believers' diets and geolocations not only reshape believers' religious experiences and actions but also form believers' new habits of dietary self-tracking and locational self-tracking.

Datafied embodiment in the embeddable Internet of Bodies devices and its potential religious transformations

A typical example of the embeddables is the embedded (invasive) brain-computer interface (eBCI). The eBCI is

invasive because it not only detects and records brain wave signals but also directly implants microelectrode arrays in our cortex and interfaces our nervous system, thereby translating the brain signals into executable output by computers. People can directly command computer-linking accessory equipment through their thoughts and even achieve thought communications through mutual brain networking (Burwell, Sample & Racine 2017:1).

Currently, eBCIs have been proposed as assistant technologies for helping patients with amyotrophic lateral sclerosis and spinal cord injury (Burwell et al. 2017). Furthermore, eBCIs can also enhance people's intelligence, empathy and memory (Molhoek 2021). That is, eBCIs can realise not only the physical integration of devices and bodies but also the mental integration of devices and bodies. Therefore, eBCI, as a magic technology, realises the wish to 'see' others' thoughts from the outside (Grübler & Hildt 2014).

In the future, imagine that through the mutual commensurable processing of our mental information and computer binary information, eBCIs will not only read and download information from the human brains into computers but also upload external information to our brains, finally achieving the mutual integration of humans and machines for data-processing purposes.

As Kurzweil (2006:16) argues, the 'singularity' moment will come when technologies profoundly transform our daily lives, and AI surpasses human intelligence. Humans have to reinvent themselves in order to keep up with technological paces. The eBCIs can be one of the reinvented projects for creating new humans. Imagine that human brains and computers can reach perfect data convergence, that is, the coworking of technology and our bodies can achieve proper data exchange between computer information and our physical and mental states. It signifies that not only will the embeddables, such as eBCIs, break down the physical boundary between humans and nonhumans, but more importantly, people will become 'immortal' in an entirely datafied way, thus overcoming the limitations of our physical bodies.[2] Accordingly, the embodiment of eBCIs will be achieved in a fully datafied way in which our physical bodies, mental states, emotions and feelings can all be reduced to data.

The embeddables (especially eBCIs) will undoubtedly lead to a series of ethical, social and cultural risks, such as harming people's humanity, privacy, autonomy, identity and responsibility (Tamburrini 2014). Moreover, the embeddables will also lead to a series of theological and religious issues and trigger profound transformations in religious practices and experiences. Suppose eBCIs become a mature product in markets, what is possible in our religious life is that 'mind reading' will be popular, and any radical ideas are likely to be detected in time, so as to avoid the spread of extremist ideas and the breeding of terrorism. This situation is not out

2.In this sense, the eBCIs reveal the idea of transhumanism in which the usage of technology has overcome the limitations of our physical bodies. See Grübler and Hildt (2014).

of thin air. Recently, several studies have shown that today's emerging technologies, such as AI robots, brain stimulation and augmented reality, can enhance, constitute and regulate people's morality, spirituality and moods (Klincewicz 2016; Lara & Deckers 2020; Trothen 2022). Similarly, the embeddables can achieve the same effects by 'mind reading', so as to enhance spirituality, intelligence and morality.

However, if 'mind reading' through the embeddables is ubiquitous, then the censorship of people's religiosity by religious authorities will be inevitable. We will all be under dataveillance. If the embeddables can enhance and alter our thoughts, emotions and feelings, there will be no infidels within a country or even on a global scale, and there will be easy to become a mono-religious society. Religious pluralism and freedom of belief will cease to exist.

As a result, even though we can 'immortal' online and enhance our spirituality and morality through 'mind reading' of the embeddables, at the same time, 'mind reading' would lead to dataveillance and privacy disclosures, thereby harming the richness and diversity of our religious lives. Finally, the embeddables will create a world in which we are connected through the signals of the Internet instead of face-to-face communication and religious diversity.

From the God Machine to the quantified religions

If the IoB devices can datafy our daily religious lives, data can characterise the level of religiosity, these two questions arise: In what way will the datafied religions emerge in the future? How will datafied religions affect our daily religious lives?

In order to answer the above questions, let us imagine the God Machine that Savulescu and Persson (2012:412) mentioned. The two authors referred to the Great Moral Project in 2050. This project will be launched by the God Machine, a 'most powerful, self learning, self-developing bioquantum computer'. The computer can monitor and supervise our thoughts, beliefs, desires and intentions, thereby intervening in immoral actions and changing our minds (Savulescu & Persson 2012:413). For the two authors, the God Machine will not restrict our freedom because it only intervenes and prevents great harms and injustices (such as killing, raping and discriminating).

However, if we all live in a world constructed by and connected with the IoB devices, which are all linked with and controlled by the God Machine, the data information of our thoughts, beliefs, desires and intentions would be inevitably harvested and analysed by it. Our daily lives and actions will inevitably conform to the data standards generated by the God Machine. There will be no freedom under the supervision of the God Machine because the data standards are not based on facts but on data flows and algorithms. So, everybody has his or her algorithmic avatar, and we must cater to our algorithmic avatars (Pauwels & Denton 2018).

That is to say, personal data is 'lively' and actively constitutes our religious lives and actions on the one hand; and acts as a capital flow that leads to the capitalisation of our daily lives on the other hand (Salameh 2021). From a sociological perspective, according to Smith (2016), Lupton (2018), Buongiorno (2019), Sadowski (2019), Romele (2021), and many other scholars, personal data is embedded in political, economic, social-cultural and technological contexts, in which the data is often harvested and profited by third parties, such as governments, companies and hospitals, which will inevitably form algorithmic avatars or data-proxies in cyberspace, thereby harming the autonomy and integrity of our bodies and leading to a series of ethical issues such as dataveillance and privacy disclosures. Accordingly, the twofold character of personal data indicates that data can shape the embodiment of individuals in the micro dimension and construct the capitalised and quantified social contexts in the macro dimension through capital operation.

Consequently, not only governments, companies and hospitals can profit from personal data, but religious groups and authorities can also profit from personal data. In a certain sense, the God Machine can be the Religious Machine that monitors our acts and degree of religiosity. Unlike the God Machine, which will not intervene in tiny mistakes and thoughts of our daily lives, the Religious Machine, however, will shape, control and datafy every aspect of our daily religious lives, from eating, clothing, and acting to thoughts, beliefs and intentions. Because any tiny aberration is a sign of ungodliness. Religions, then become datafied and quantified religions, rather than spiritual practices based on the freedom of belief of individuals.

By coincidence, Lupton (2016:3) mentions the 'Quantified Self' as a social movement that refers to 'using numbers as a means of monitoring and measuring elements of everyday life and embodiment'; similarly, quantified religions can be viewed as a factual description that emphasises both the religious sociocultural structures and individuals' religious experiences and practices are datafied and measured by the ubiquitous IoT and IoB devices, thereby forming a homogeneous religious model based on data, replacing the diversity and individuality of religious structures and experiences.

Either the 'Quantified Self' or the quantified religions, when our brains are connected to quantum computers through the embeddables, our algorithmic avatars are generated in cyberspaces, thereafter creating our data selves online. As Boddington (2021) argues that our true physical selves and virtual data selves are both 'fully utilised and engaged together' on the one hand and separated and consistently inconsistent on the other hand. Consequently, our physical selves have to cater to the characteristics of the data selves generated automatically by the algorithms in order to fit well into the social environment governed by data standards and algorithms.

Data selves and our quantified religious future

The datafication of our identities, according to Cheney-Lippold (2017:7), determines who we are online, and the online identities, therefore, are decided by advertisers, marketers and governments. Therefore, we are all data selves because the data derive from the IoB devices and represents all aspects of our physical, psychological and spiritual activities. Similarly, the datafication of religions constitutes our online religious identities and shapes our religious behaviours and attitudes (Cheong 2020). For Cheong (2020:404–406), the datafication of religions can promote religious transmissions and mould religious engagements. For example, the Bible application provides gamification and motivates the reading plans of users, thereby shaping users' regular religious practices and enhancing religious communications among users.

Nevertheless, through the datafication of our daily lives and religious practices, our thoughts, beliefs, desires, emotions, and intentions can flow across subjects. It implies that these dispositions can exist separately from physical bodies and become data resources shared among all human beings.

Consequently, the data selves can be generated and updated autonomously according to algorithms so that third parties can predict the possible actions and preferences of the data selves. This could easily forge a gap between our true, physical selves and our virtual data selves. After all, the data selves are not real and cannot substitute for the true selves because the data selves are just the representation of subjects (Liberati 2018).

In the above sense, data itself cannot present fact, but has its value 'bias'. According to Innis (2008), every medium and every technology has 'the bias of communication', thus, personal data will inevitably reflect the interests of commercial companies, political parties, religious groups and religious authorities. Hence, data selves and true selves easily fall into two separate but parallel worlds.

If data selves are ubiquitous and constantly shaping our true selves, then the data selves will become 'true', or at least become a significant part of our true, physical selves. Then, our religious practices will inevitably become datafied and quantified. If datafication can guide, nudge and predict different religious practices, then religious authorities, technical platforms, political powers and commercial corporations can intervene and set data standards of religious practices. Sequentially, there will be a 'religious data gap' between different religions, which can be regarded as the manifestation of religious data inequality.

That is to say, data now have become our vital assets and status 'symbols', so whose data, where data are stored, and what sort of data need to store can be seen as vital issues in the contemporary era. If data are a commodity, then the more

people are datafied, the more data are stored; and the more data are stored, the more capital is gained. As Mark Taylor (2021:24) argues that today's emerging technologies are built on a foundation of surveillance capitalism, which 'combines consumer and finance capitalism by creating high-speed exchange networks where trillions of transactions provide endless data to be mined for economic advantage'. Meanwhile, data mining is essentially a manifestation of a power relation, whoever controls data, whoever has power; and whoever has power, whoever has the conveniences to reproduce and interpret data. Thus, under a data-driven economic, political and social structure, everything can be datafied; humans and nonhumans become commodities and objects of power operation.

From the above sense, we can deduce that only the most powerful and commercially successful religions will be able to fully develop and gain data advantages in the IoB era. In contrast, the uncommercialised and hard-to-datafy religions will gradually die out, unable to represent them in the flood of data. There will be only one form of religion, the Quantified Religion, which smooths out the differences in language, culture and value among different religions by means of datafication, so that believers worldwide are bathed in a uniform and homogeneous religious digital matrix. The ultimate goal of the Quantified Religion is to achieve digital immortality of all human beings. This brave new utopian ideal would include all humans in its quantitative indicators, driven by capitals and algorithms; the Quantified Religion will constantly shape our new and unified religious practices and experiences in the way of datafication, and no one can escape.

Concluding remarks

This paper discusses the datafied embodiment of the IoB technology from the perspective of postphenomenology. The author analyses in detail the implication of embodiment from phenomenological and postphenomenological perspectives and then demonstrates in what sense the data collected from the IoB devices that people wear, ingest and embed can constitute our embodiment and selfhood. Thereafter, the author elucidates how the wearable, ingestible and embeddable IoB devices mediate and transform our religiosity, including religious practices and experiences.

Moreover, the author illustrates the future religious model in the forthcoming IoB era, that is, the Quantified Religion. The author argues that the Quantified Religion would smooth out the differences and diversities between religions, and then create homogeneous religious data selves, and mediate, reshape, constitute and even replace true selves. Furthermore, there will be a 'religious data gap' between different religions, accelerating religious inequality and shaping the data hegemony of a particular religion.

With the widespread application of the IoB technology, the collection and analysis of personal data will be ubiquitous; thus, the personal data as a sort of capital flow will become a social asset, and individuals will have no control over where and how their data will be used. Data harvesting and analysing will become technological 'black boxes' in which the data will be sorted and reinterpreted by third parties such as governments, companies, hospitals and religious institutions. Data standards will not only determine our daily lives but also determine our religious practices and religiosity levels.

In response to the religious challenges of the IoB technology, we need to be more vigilant about its application, especially regarding the misuse of personal data. For a postphenomenological approach, responsible designing of the IoB technology would be one of the necessary initiatives to address risks. According to Verbeek, technological design is an inherently moral activity in which designers help shape moral decisions and practices because technological artefacts bear moral values through responsible design. Then, these artefacts can mediate and shape our actions and practices and guide us to have a good life (Verbeek 2011:90).

Accordingly, if we want to have better religious lives through applications of the IoB technology, then the responsible design of the IoB devices for religious concerns will be a crucial measure to address the risks of data misuse. It means that designers need to combine the context of design with the context of use and take stakeholders' relevant concerns into account in order to augment technology assessment constructively (Verbeek 2011:102). For example, designers can set default encryption mode for personal data when the data is collected from the IoB devices and uploaded to the database unless users choose to turn off this mode. Such a measure would prevent personal data from being collected and misused by third parties and allow users to share their data as they wish.

Moreover, guaranteeing individuals' 'data sovereignty' in the upcoming IoB era would become necessary (Boddington 2021). That is to say, only when individuals own personal data can they reflect the actual conditions of our bodies and spirituality, and the gap between data selves and true selves be eliminated. Likewise, individual believers should have total ownership of their religious data, and no third party can harvest, analyse, communicate and share these data without consent. In other words, collecting and analysing religious data can constitute better religious experiences and practices and promote understanding and prosperity among religions rather than exacerbating religious inequality through religious datafication.

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Competing interests

Author's contributions

Z.L., is the sole author of this research article.

Ethical considerations

This article followed all ethical standards for research study without any direct contact with human or animal subjects.

Data availability

Data sharing is not applicable to this article as no new data were created or analysed in this study.

Disclaimer

The views and opinions expressed in this article are those of the author and do not necessarily reflect the official policy or position of any affiliated agency of the author.

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