Short Note

David Levy*

Some aspects of human consent to sex with robots¹

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Abstract: Part of the ethical debate about sex with robots concerns whether sex with a robot is rape of that robot. It therefore makes sense for us to debate what should be the boundaries of consent, decades from now, i.e. consent given by humans to robots. How will the sexbot landscape look in situations when it is the human who is consenting, or not, to a sexual invitation or advance by the robot? The sexbot will have responsibilities towards its human partner, and there will be moral and legal consequences if it fails to deliver on those responsibilities. An unresolved ethical argument employed by many of those who deplore the coming advent of sex robots is that robots are unable to proffer a meaningful indication of sexual consent, and therefore a human deciding to have sex with a robot is committing rape of the robot. A parallel question, as yet to be addressed, is under what circumstances should a robot be considered to be acting in a sexually inappropriate or illegal manner towards a human? And this question embraces some others, including: “How can a robot determine, with any degree of certainty, whether or not a proximate human wants or at least consents to sex?”; “What behaviours by a robot are permissible within the #MeToo context when the robot is exploring a proximate human’s current level of sexual interest in the robot?”; and “If a robot oversteps the accepted bounds of sexual behaviour with a human, who is responsible and what should be the legal consequences?” We discuss these issues and speculate on how the sex robots of the future will be able to conform to the ethics of consent.

1 Introduction

One of the ethical arguments employed by those who deplore the coming advent of sex robots is that robots are unable to proffer a meaningful indication of sexual consent, and therefore a human deciding to have sex with a robot is committing rape of the robot [1–3]. That particular argument is as yet unresolved.

A parallel question, which does not yet appear to have been addressed, is under what circumstances should a robot be considered to be acting in a sexually inappropriate or illegal manner towards a human? And this question embraces some others, including the following:

- (a) How can a robot determine, with any degree of certainty, whether or not a proximate human wants or at least consents to sex?
- (b) What behaviours by a robot are permissible within the #MeToo context when the robot is exploring a proximate human’s current level of sexual interest in the robot?
- (c) If a robot oversteps the accepted bounds of sexual behaviour with a human, who is responsible and what should be the legal consequences?

This talk is intended to open the debate on such issues.

2 The shape of robot sex to come

Genuine sex robots have only just, this year, appeared on the market. (I discount the claims by Douglas Hines and his company TrueCompanion regarding Roxxy and Rocky, which I have always been certain are nothing more than fraudulent money-making scams.)

Matt McMullan has led the way in the creation of state-of-the-art sex dolls and is now doing the same in the field of sex robots. But the sexbots I am talking about

¹ When referring to any of the computational aspects of robots, such as their artificial intelligence, I treat the word “robot” as being synonymous with “computer”.

* **Corresponding author: David Levy**, Kami Computing, Herzilya, Israel, e-mail: davidlevylondon@gmail.com

here are not those of 2019. My topic today relates to generations of sexbots in the future, perhaps a decade or two from now – sexbots whose artificial intelligence (AI) is at or above the level of most humans, and with human or superhuman capabilities of physical and sexual dexterity, and with seduction techniques to match. Romy Eskins [2] succinctly captures the capabilities of such sexbots thus:

These robots will be autonomous and interactive, with flesh-like skin, affective computing, highly developed sensory perception, refined language skills, the capacity to learn, and multiple preprogrammed personalities. They will adapt to the sexual preferences of their user and base their sexual performance on an extensive amount of data, which will enable them to provide sexual gratification for their users. These sexbots of the near future will also display sentient behaviour, such as the experience of sexual pleasure when internal sensors are triggered, without actually having qualitative experiences. Moreover, their programming will cause them to demonstrate complex emotional behaviour, which will allow for the formation of intimate sexual and emotional relationships with their users.

Although not human, such sexbots will be our equals or betters in many ways. They will have a wide-ranging repertoire of behaviours, be accepted by much of society as quasi-persons, with at least some civil and legal rights and responsibilities. As Robert Sparrow opines [3]:

They are likely to play an important role in shaping public understandings of sex and of relations between the sexes in the future.

Just as today, there is debate as to whether sex with a robot is rape of that robot [2]; it makes sense for us to debate what should be the boundaries of consent, decades from now, consent given by humans to robots. When, in 2030 or 2040, a sexbot indicates to its human partner that it is in the mood for sex, what will be the moral and legal boundaries involved in its human partner's response? How will the sexbot landscape look in situations when it is the human who is consenting, or not, to a sexual invitation or advance by the robot? The sexbot will have responsibilities towards its human partner, and there will be moral and legal consequences if it fails to deliver on those responsibilities.

Lily Frank and Sven Nyholm [1] conjecture that:

If the robot – as well as the human – could consent to it, sex between mutually consenting humans and robots could set a good, rather than a bad, example for sex between humans. The worry that human-robot sex sets a bad example for human-human sex can either be dealt with by not having any human-robot sex or, alternatively, by creating morally and

legally defensible types of human-robot sexual relations. If what sex robots symbolize becomes something desirable and justifiable – i.e. consensual sex – this would indeed change what sex robots symbolize in a good way, in line with how Danaher argues that we should try to make robot sex symbolize something positive, rather than something negative.

Frank and Nyholm also conjecture:

that with future advances in what autonomous and smart robots are able to do on their own, it is also likely and probable that future robots will be able to perform the functions we associate with deliberating about a sexual proposition and then either giving, or not giving consent.

I fully subscribe to this conjecture and I go even further. When the robots of the future can decide for themselves whether or not to consent when sexual activity is requested of them, they will similarly be able to decide for themselves whether or not their human partner is consenting to a sex request from the robot, and how to behave as a consequence.

For the purposes of this talk, I consider these questions in the context of a heterosexual malebot which expresses its desire for sex with a human (female) partner. The robots of the future will increasingly be endowed with artificial personalities, emotions, moods and desires, and one of the desires of heterosexual malebots will be to engage in sexual activity with women. The strength of a malebot's artificial libido will be one of the factors affecting how often and in what ways it attempts to initiate intercourse, a factor which, however, will need to be modulated by the constraints of whatever consent policy has been programmed.

3 The changing face of consent

There is a large and fast growing literature on what constitutes sexual consent. The rapidity of its proliferation correlates with the birth and growth of #MeToo, “no means no”, and other movements in which women are at last establishing their rights to freely and successfully refuse to consent to sex whenever they wish. Much of this literature addresses the legal aspects of consent, such as what exactly constitutes rape. What does a woman have to do in order to make it clear, from a legal perspective as well as a social one, that she does not consent?

In her paper “Negotiating Sex”, Michelle Anderson [4] describes what she calls the “yes model” and the “no model” for answering this key question. Under the no

model, which dates from the 1987 book *Real Rape* by Susan Estrich [5], “when a woman says ‘no’ to a man’s sexual advances, she does not consent.” Without a “no” the law presumes that the woman consents, so a verbal refusal is required to indicate her lack of consent. Under the yes model, the origin of which Anderson traces back to a 1993 paper in a legal journal by Lani Anne Remick [6], a man must obtain affirmative permission from his partner. If a woman does not express a “yes” of some kind, the law presumes that the woman does not consent. The phrase “of some kind” is both clarified and obscured by Stephen Schulhofer [7] to mean “by words or conduct”; clarified because conduct can indicate consent or its refusal, and obscured because conduct is frequently open to misinterpretation, as indeed a verbal response can sometimes be. As Anderson explains [4]:

Defenders of the Yes Model make two important points. First they emphasize that a woman’s silence alone cannot mean “yes”. This is the Yes Model’s attempt to break from both the common law and the No Model. Second – and in some tension with the first tenet – they underscore that a woman can express a “yes” through her nonverbal behaviour. Stephen Schulhofer, architect of the Yes Model, argues that engaging in “sexual petting”, for example, can express a “yes” to sexual penetration. “If she doesn’t say ‘no’, and if her silence is combined with passionate kissing, hugging, and sexual touching, it is usually sensible to infer actual willingness.”

So when things heat up, the yes model melts into the no model, in which silence constitutes consent.

Anderson continues [4]:

At its core, the Yes Model relies on a man’s ability to infer actual willingness from a woman’s body language. Yet study after study indicates that men consistently misinterpret women’s nonverbal behaviour. They impute erotic innuendo and sexual intent where there is none. Any theory that relies on a man’s ability to intuit a woman’s actual willingness allows him to construct consent out of stereotype and hopeful imagination.

Anderson’s paper introduces a third model which she calls the negotiation model, which is based on the concept that partners should have to consult and communicate with one another to discern each other’s desires and limitations before sexual penetration occurs:

The Negotiation Model requires consultation, reciprocal communication, and the exchange of views before a person initiates sexual penetration. It requires communication that is verbal unless partners have established a context between them in which they may accurately assess one another’s nonverbal behaviour. The verbal communication must be such as would indicate to a reasonable person that sexual

penetration has been freely and explicitly agreed to. The distinction between negotiation and consent is more than semantic.

As a model it seeks to maximise the opportunity for sexual partners to share intentions, desires, and boundaries. Negotiation manifests itself as mutual consultation and the expression of preferences. It ideally involves a discussion of the partners’ tastes and an agreement to engage in mutually desired behaviours.

Unlike the traditional notion of consent, negotiation assumes reciprocal responsibilities between partners and equal authority to direct the sexual interaction, whatever the partners’ genders and sexual orientation.

The minimally required negotiation for penetrative acts needs to be specific, but it need not be formal. People rarely say anything like, “I agree to have vaginal sex with you. Let us now proceed.” Instead they say things like, “Kissing you is making me so hot. I want you to be inside me. Do you want that too?” Though informal, the communication does all the work that negotiation requires. It states a desire and asks the other person for their position, providing the opportunity to express anything from mutual longing to aversion.

I conjecture that the negotiation model will lend itself extremely well to the sexual script’s approach to consent which I shall explain shortly.

4 The communication and miscommunication of consent

Before we address the plethora of ways in which a woman can express her sexual consent or lack of it to a malebot, we must first consider the multifarious ways in which communication happens, both successfully and discordantly, in human–human sexual situations.

Katlyn Gangi provides a comprehensive survey of this topic and its literature in her PhD thesis, “Communicating sexual consent” [8]. She highlights a recent change to the law in California, which reflects the modern trend to require an “affirmative, unambiguous, and conscious decision by each participant to engage in mutually agreed-upon sexual activity” [9]. Such consent must be clearly communicated and accurately understood at each individual sexual encounter. But difficulties in communication can arise because different people interpret the same behaviour in different ways, and many men tend to overestimate sexual interest from women, often misreading signals, due perhaps to optimism or their testosterone-fuelled desire. Because sexual consent is based both on sexual intention and on

the accurate communication of sexual intention, and because such intentions can be communicated nonverbally as well as verbally, misinterpretation sometimes occurs, with the resulting misunderstanding leading to sexual activity which is unwanted by one or sometimes both partners.

In recent years, a body of research work and its literature have evolved, contributing to our understanding of the various ways in which consent, or the lack of it, are communicated and interpreted. That research reveals that misinterpretation of a partner's consent can occur for a number of reasons. Gangi [8] refers to the dynamic social process by which people communicate their sexual interest or lack of it as “sexual bargaining”, redolent of the title of Anderson's paper “Negotiating sex”. Gangi explains how misinterpretation can occur at different points in the process, during which:

Perceptions of sexual interest and of consent to engage in sexual activity can be divergent because the cues that people use to estimate sexual interest are often ambiguous, unclear, and confusing. While communication of sexual intent is expressed on a continuum from overt and direct to covert and veiled, indirect approaches to communicating sexual intent are used more often by both men and women and are preferred to overt approaches, with direct verbal communication typically utilized as a last resort.

Gangi points out that one of the reasons many women prefer indirect approaches when communicating disinterest is because they do not want to hurt their partner's feelings. The same reason is likely to apply to the responses from women to the coming generations of malebots, because those malebots will have artificial emotions and might show their displeasure in unattractive ways if their partner responds with a direct “not tonight darling”. Indirect responses can also lead to problems in the malebot's understanding of the meaning of its human partner's behaviour. For example, the nonverbal behaviour of not resisting a sexual advance is often incorrectly interpreted by a man as indicative of a woman's willingness to engage in sexual activity; and if it is difficult for a man to recognize certain sexual clues, it will be far from trivial for robot designers to incorporate accurate cue recognition in their malebots.

To summarize, Gangi's study of the literature reveals that a major hurdle in accurately interpreting sexual consent is the preference of many women to use nonverbal rather than verbal cues. Some of the nonverbal cues often misunderstood by men as consent include participating in sexy conversation, going somewhere private, eye

contact, and “accidental” touching. Cues indicating a lack of interest include body language such as pulling away from an embrace, avoiding eye contact, or crossing one's arms.

Gangi [8] cites the research of Kristen Kozlowski et al. [10] who offer several reasons for the tendency to employ nonverbal cues, including relying on culturally embedded sexual scripts and discomfort with asking for explicit verbal consent due to a fear of ruining a romantic mood. Overall, research indicates that much of the communication in the context of sexual consent is indirect in nature, often making accurate interpretation problematic. The misunderstandings that can occur in a consent interaction include errors of judgement as to a partner's thoughts and feelings that might not have been clearly communicated.

As Anderson points out [4]:

An additional problem is that agreement between partners is dynamic and active. Agreements change over time, and must be sensitive to context and changed circumstance. People can and do change their minds.

A high-profile example of this was when WikiLeaks founder Julian Assange was having consensual intercourse with a woman in Sweden and their condom tore during use. The woman asked him to stop but he did not, and the Swedish police pursued him for rape. As a result, he sought and was granted asylum in the Ecuador embassy in London, where he lived for 7 years, before he was compelled to leave. Whatever the circumstances, a malebot, like a human, needs to be able to monitor their partner's wishes throughout the sexual experience and behave accordingly.

To summarize, given the difficulty often experienced by humans in conveying and understanding cues of sexual disinterest, it is clearly going to be a non-trivial task to teach malebots how to navigate appropriately through sexual bargaining/negotiating scenarios and how to behave when a woman is not explicit in expressing her consent or refusal.

5 Sexual scripts

I mentioned sexual scripts above. I now return to this topic with an explanation of what sexual scripts are and how I believe they will be used in future generations of sexbots to address the problems that revolve around the communication and miscommunication of sexual cues.

Script theory is a psychological theory which posits that much of human behaviour falls into patterns called “scripts”, because behavioural scripts function in a similar way to written scripts, providing a series of events for action. In the world of AI, scripts were developed during the 1970s by Roger Schank and Robert Abelson [11] to represent sequences of events, organizing the representation of knowledge about a domain in a way that directs attention and facilitates recall, inference, the evaluation of situations, and the prediction of events that will occur.

The most cited 1970s’ example for a script is Schank’s example of a restaurant script (Figure 1). This script encompasses a normal sequence of events for a customer in a restaurant. He finds a free table, sits, waits for the waiter to take his order, and finally eats his meal. The script itemizes each step of the process and stores the steps in the order in which they happen.

Sexual scripts for heterosexuals represent the ways men and women interact with each other, including how each gender should behave in sexual or romantic situations. A sexual script is thus a mental story detailing specific events in the male-female relationship and assigning certain roles to each partner.

A simple example of a sexual script is a man inviting a woman out to the cinema. A sexual script might suggest that he is expected to pay for both tickets, and if he fails to do so he is then violating that particular script for a traditional date. If the woman subscribes to the traditional version of this script, then she might feel that he has not lived up to her expectations, with the possible consequence that she will not go out with him again.

More content is found in an example sexual script constructed from the responses to a survey carried out by Heather Littleton and colleagues [12]:

Man and woman drink alcohol.
 Man compliments woman.
 Woman verbally protests engaging in intimate activity.
 Woman physically protests against engaging in intimate activity.
 Man verbally persuades woman to engage in intimate activity.
 Woman nods or says “Okay” after man’s verbal persuasion.

The concept of sexual scripts was introduced by sociologists John H. Gagnon and William Simon in their 1973 book “Sexual Conduct” [13]. The idea enables us to understand human sexual activity as social and learned

Figure 1: Schank’s example of a restaurant script [11].

interactions. Writing in the *Annual Review of Sex Research* 1990, Gagnon concluded that:

Examining sexual conduct from the perspective of scripting allows one to organize and link together what people think, what they do, and how they are affected by the socio-cultural context in which they live. Seeing the conduct as “scripted” on the interpersonal and intrapsychic levels gives the behaviour the quality of a narrative in which conduct is composed of events ordered in time, events that occur with sufficient regularity that individuals recognize them when they occur, often wish to participate in them, and remember them when they are over. At the cultural level instructions for conduct do not stand alone as “rules” or “norms”, but are rather embedded in narratives of good and bad behaviour, things to be done, things to be avoided. Changes in the cultural scenarios are changes in the instructional systems for conduct. Such changes provide opportunities for individuals to reorganize what they think about the sexual and offer them different goals when they engage in sexual activity. As individuals come together sexually they are required to change what they do in practice and what they think about themselves as a consequence.

Katlyn Gangi’s interest in scripts is based on the capacity of sexual scripts to contain beliefs related to how an individual should act in sexual situations. She writes [8]:

A substantial literature confirms the presence of sexual scripts: mental frameworks that dictate expectations for how a sexual encounter unfolds, and how individuals behave. Transmitted primarily through media and socialization, sexual scripts provide structure and predictability to the experience by prescribing who can participate, how they should communicate, where these actions should take place. However, an overreliance on scripts may lead an individual to arrive at inaccurate inferences about their partner’s thoughts and feelings, namely misperceiving their partner’s sexual consent.

As Schulhofer argues [7]:

Sexual communication is so often indirect and contradictory that it is a wonder mistakes do not occur more often. What seems certain is that miscommunication about sexual desires is entirely commonplace. If we consider actual behaviour of real people in our world as it stands, mistakes about consent, including mistakes about the meaning of “no”, are undoubtedly frequent.

Although it appears from Gangi’s research that humans are indeed not wonderful at navigating their known sexual scripts, it is precisely through the use of sexual scripts, using AI methods, that I believe sexbots can be taught appropriate sexual consent behaviour. Before I explain my support for their use of sexual

scripts, let us first consider Gangi’s critique of the use of such scripts in human–human encounters:²

A key tenet to the sexual scripts perspective is that sexuality is learned from cultural messages that define how to act in sexual encounters. For example, texts written by “pick-up artists” describe techniques for arousing women, suggesting that men should ignore women’s verbal cues and interpret arousal as consent. Self-help books such as those written by pick-up artists serve as direct references to a prescribed sexual script, but influences can be indirect as well, such as observing the ways sexual encounters unfold in popular television programmes.

In sum, culturally-embedded sexual scripts serve as heuristics that guide both sexual behaviours and conversations about sex, which may contribute to misunderstandings between sexual partners. In place of direct information seeking from one’s sexual partner, sexual scripts are utilized to reduce uncertainty about both the partner’s desires as well as how the scene should unfold.

Put differently, those who rely heavily on scripts as a mental shortcut may overestimate their partner’s sexual interest as well as miss social information that is not script-consistent – such as lack of communicated consent or resistance to continue with the sexual encounter.

6 How robot intelligence will employ sexual scripts

While human reliance on sexual scripts suffers from the weakness explained by Gangi, the situation will be very different for future generations of sexbots, partly because a human’s repertoire of sexual scripts will inevitably be rather sparse, whereas robots in decades to come will have access to huge collections of scripts on just about every subject under the sun, including every brand of seduction, sexual behaviour and lovemaking technique. We can therefore expect sexbots to be able to call upon a “big data” collection of sexual scripts.³ The automatic acquisition of script knowledge from a text collection [14] will enable the creation of big data sets by aggregating all the knowledge found in books and other media on the subject of sexual relationships and love-

² I have deliberately transposed the order of the second and third paragraphs from Gangi’s original [8].

³ “Big data” sets can be analysed computationally to reveal patterns, trends and associations, especially relating to human behaviour and interactions.

making skills. Imagine a lover who knows everything written about lovemaking, and this knowledge will include an understanding of which cues generally mean what under various circumstances, and which sex initiation attempts will be the best ones to try. As a malebot learns from its sexual experiences, it will develop its understanding of each of its female partners and their sexual turn-ons and turn-offs, enabling the malebot to optimize its attempts to achieve consensual sex. Its learning will, of course, take into account the sexual cues and sexual preferences of each partner, helping its accuracy when evaluating each partner's cues and improving the malebot's seduction skills as perceived by each partner.

7 The capacity of robots to recognize consent and its refusal

The ordering of the events within a given script will be processed automatically, employing methods akin to those currently being investigated in AI for script event prediction [15,16]. And a big data set of internally ordered sexual scripts will then be available for prediction methods based on analogy reasoning [17], deep learning techniques, and whatever other methods AI researchers discover in the meantime. This is how I believe the malebots of the future will be able to navigate successfully through the maze of signals, the complex and the nuanced, to avoid the possibility of it misunderstanding no and understanding yes, whenever it encounters them, either as verbal or as nonverbal cues. The emotional intelligence employed by a considerate and moral man, when aiming for sex with a human partner, will, in the malebots of the future, have its parallel in their emotional AI. This form of AI will enable malebots to determine whether or not a proximate human wants or at least consents to sex, and to know what behaviours are morally and legally permissible when the malebot is exploring a woman's current level of interest in the prospect of a sexual encounter between them.

It could be argued that a robot's interpretation of the learned sexual script data might be biased in some way by human prejudices. But any such fears could be assuaged by being selective in the sources from which the scripts are gleaned, or by conducting an ethical examination (by humans) of every script extracted, before the script is incorporated to the big data set on which the learning process is applied.

8 If a robot transcends sexual boundaries

But what happens if a malebot breaches the acceptable norms of seduction or sexual activity with a woman? If its AI fails? If the woman feels emotionally and/or physically violated by a malebot's behaviour in the face of what she wanted or the limitations of her consent? Who, then, should be held responsible, and what should be the consequences upon them?

It will often be extremely difficult, and in many cases impossible, to determine liability for damage caused by an autonomous robot [18]. In a study conducted by the Legal Affairs Committee of the European parliament in 2016, one of the common problems in ascribing responsibility, highlighted by the committee's report, is that:

Damage caused by autonomous robots might also be traced back to user error. In such instances, either strict or fault-based liability may be imposed, depending on the circumstances.

This would seem to imply that, in some cases of inappropriate or illegal behaviour by a malebot seeking sex with a woman, the woman herself could be found to be liable. To me this sounds too much like "She was asking for it", and other accusations levelled against women who have been the victims of sexual predators.

The European Union (EU) study fails completely to proffer any useful proposals on how to deal with situations when robots do wrong. It does, however, explain a number of the problems facing lawmakers in dealing with such situations:

We should note that setting up a specific liability regime for autonomous robots, while other robots remain subject to traditional regimes, could create problems. In the event of damage, the parties might prefer to apply one regime rather than the other. Judges will then be constrained to analyse, on a case-by-case basis, the characteristics of the robot in dispute, to check whether the robot corresponds to the definition of a smart robot in the present motion and to determine the applicable law. It follows that proceedings for damage caused by a robot might well always need to be preceded by recourse to an expert to determine the machine's capacities. This would lead to a considerable increase in procedural costs and slow down legal proceedings. In view of this, a uniform application of the future provisions to all robots might be a solution, given that only autonomous robots pose any real trouble in determining liability.

Judging from the bibliography of their report, the EU committee does not appear to have considered any of the important literature on the subject of legal responsibility

for damage caused by robots. In [19], “When Robots Do Wrong”, in which I discuss this very problem, I presented a bibliography of 13 key publications on the subject. None of those, nor my own paper, are referenced in the EU committee’s bibliography.

To this day no one appears to have come up with a better way to deal with robot wrongs than the one proposed in my paper.

In the face of so many potential obstacles to a fair outcome in a court case, and considering how swamped the courts would become with the inevitable multitude of robot accident cases, it is clear to me that litigation cannot be the answer. But the idea of mandatory robot insurance, based on the no-fault insurance model, has some very significant advantages:

- (a) It will be relatively easy to administer.
- (b) Technology will monitor and enforce the legal requirement for owners to be adequately insured.
- (c) Robot owners will find it financially appealing to choose safer makes and models of robot, because of the lower insurance premium add-on.
- (d) Robot developers and manufacturers will lose sales if their products are relatively unsafe, since they will attract higher insurance premiums.

Unless it is clear that a malebot behaving in a sexually inappropriate or illegal manner is doing so as a result of some deliberate act by one or more human, it seems natural to class such sexual inappropriateness or illegality as accidental. I therefore suggest that the no-fault insurance model is ideal for dealing with this problem. If a woman says no to her malebot companion but it nevertheless proceeds to force itself upon her, she should be entitled to financial compensation from the robot’s insurers. To repeat my conclusion from my 2012 paper, we can see the risks already. Let us plan to insure against them.

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