



## Sex And The Internet

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***WARNING: All web links in this document have been verified as not containing adult (pornographic) content. If you choose to conduct your own web searches on the ideas and issues discussed, you may be presented with adult content and material that you may find distressing. This lecture may not be suitable for children: caregiver/educator discretion is advised.***

In the words of La Tour's 1991 dance anthem, "People are still having sex. They've been doing it for quite a while." And if you're someone who thinks that safe, consensual sex is morally wrong, this lecture may not be for you. It is in equal parts an exploration, a celebration, and critical evaluation of how sex has changed tech, and how tech has changed sex.

For the last thirty years or so, people have been having what used to be called 'cybersex' and is now just called 'sex'. In my research on cybersecurity, I frequently critique the 'cyber' prefix.<sup>1</sup> As you'll know if you watched some of my lectures last year, I've found that it is often used deliberately to create an air of exoticism, otherness, and distance on a range of topics related to the online world that really should feel more immediate to us.

When it comes to intimacy, we can observe another trend. Over time, words lose their 'cyber' component. What Time magazine referred to as 'cyberporn' in 1995 by 2016 had become just 'porn.'<sup>2</sup> In my lecture on the [Massive Internet of Things](#), we considered the claim by Mark Weiser, one of the fathers of ubiquitous computing, that "The most profound technologies are those that disappear." The disappearances of cyberporn and cybersex seem to be following the same pattern. The consumption of digital content and the experience of intimacy through IT is so embedded in most of our lives that such an artificial distinction is now meaningless.

This is a different trajectory to 'phone sex', which remains trapped in the tech that enabled it. The chat lines popular in the 1990s still exist, but phone sex remains frozen in time because technological developments turned the phone into a multifunctional pocket computer. Why have *just* voice sex when you can choose from voice, video, photos, text, or a richer, combined experience?

## Our Sex Lives Digitised

When an aspect of human life goes digital, researchers like me rejoice because it means we have access to new data sources. For instance, if we want to learn about the prevalence of access to adult sites, statistics on the world's most visited websites can be informative:

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<sup>1</sup> Victoria Baines (2022) *The Rhetoric of InSecurity: The Language of Danger, Fear and Safety in National and International Contexts*. Routledge. London & New York.

<sup>2</sup> <https://content.time.com/time/covers/0,16641,19950703,00.html>; <https://time.com/4277576/in-the-latest-issue-65/>

Domain	Visits (billions)	Desktop Share %	Desktop Count (billions)	Mobile Share %	Mobile Count (billions)
google.com	168.67	16.36	27.6	83.64	141.08
youtube.com	112.09	12.65	14.18	87.35	97.92
facebook.com	17.96	36.97	6.64	63.03	11.32
pornhub.com	12.33	3.51	0.43	96.49	11.9
twitter.com	9.14	26.02	2.38	73.98	6.76
wikipedia.org	9.03	17.87	1.61	82.13	7.42
xvideos.com	7.72	4.12	0.32	95.88	7.4
instagram.com	7.63	32.77	2.5	67.23	5.13
reddit.com	7.23	21.66	1.57	78.34	5.67
amazon.com	4.77	40	1.91	60	2.86

Figure 1. Top 10 websites worldwide (all industries) December 2023 (data from Semrush<sup>3</sup>)

Even this limited dataset appears to confirm that mobile technology now dominates our use of the web. The trend is even more marked for the adult content domains pornhub.com and xvideos.com, one possible explanation for which could be that desktop computers are more likely to be shared, making privacy more challenging. It may come as a surprise to see that Pornhub now has more visits than X (formerly known as Twitter), Xvideos more than Amazon. When we factor in that platforms such as Reddit also contain channels for adult content, and that use of Google to search for pornography has also increased over time<sup>4</sup>, it appears that the appetite for and access to adult content online is considerable. Indeed, Ofcom’s *Online Nation* survey found that 29% of UK online adults accessed a pornographic content service in May 2023 – that’s 13.8 million of us, 10.1 million of whom are men.<sup>5</sup> Given that this data relies on what respondents are comfortable with disclosing, the true numbers are likely to be higher.

Market leader Pornhub publishes insight reports on searches on their platform, and they offer striking insights into the content we desire, our demographics, and our behaviour. For instance, we are able to establish that there are expected differences – but also some marked similarities – between what [people identified by the platform as] men and [people identified by the platform as] women search for.<sup>6</sup> Location-based data may indicate regional trends in levels of royalism among UK viewers, the North East of England showing the largest drop-off in traffic during the King’s Coronation, but also appears to correlate in some cases with support for national Eurovision entries.<sup>7</sup> We of course need to ensure that we don’t read too much into this data, and in particular that we don’t confuse correlation with causation. But the data are certainly intriguing. At the very least, they prompt us to ask further questions about our dynamic use of digital tech for sexual gratification.

## Porn Pioneers

The adult entertainment industry recognised the potential of the Internet, and especially the World Wide Web, very early on. They were among the very first companies to monetise online content. In doing so, they provided significant demand for real-time credit card verification and the-then nascent online payments industry. They were also early adopters of online advertisements and affiliate programmes, now cornerstones of digital business models. The industry has been linked variously to the development and rollout of high-speed Internet connectivity, Flash and video compression technology. In the words of Jonathan Coopersmith, a professor of the history of technology at Texas A&M University, the adult content providers are “the shock troops” of digital innovation.<sup>8</sup>

We often talk about innovation in IT as disrupting established industries. That certainly seems to have been the case for the adult content industry, where the rise of ‘tube sites’ – video sharing platforms – in the 2000s is widely regarded as bringing about the end of studio-dominated production of pornography. As on social media, user-generated content became more prominent on adult sites in the 2010s, with all the safety and content moderation challenges that entailed. While this initially democratised production, larger providers

<sup>3</sup> <https://www.semrush.com/trending-websites/global/all>

<sup>4</sup> See, for example, Google Trends results for the search term ‘porn’ since 2004 - <https://trends.google.com/trends/explore?date=all&q=porn&hl=en-US>

<sup>5</sup> [https://www.ofcom.org.uk/data/assets/pdf\\_file/0029/272288/online-nation-2023-report.pdf](https://www.ofcom.org.uk/data/assets/pdf_file/0029/272288/online-nation-2023-report.pdf)

<sup>6</sup> <https://www.pornhub.com/insights/2023-year-in-review#more-21875>

<sup>7</sup> <https://www.pornhub.com/insights/coronation>; <https://www.pornhub.com/insights/eurovision-2023>

<sup>8</sup> <https://edition.cnn.com/2010/TECH/04/23/porn.technology/index.html?hpt=Sbin>

saw an opportunity to centralise and industrialise distribution of live-streamed performance through ‘cam sites’.

Performers seeking to maintain control of their content and businesses moved to platforms such as OnlyFans. Charging subscriptions for access to content, and often performing to order, some have made full use of technology that allows for greater performer/fan interaction. Sex toys, like those manufactured by Lovense, can be set to activate on receipt of tips from viewers. The same company also provides the ability for two toys to communicate with each other through a proprietary app.

When a viewer of live-streamed pornography can give a physical stimulus to a performer and perhaps receive one in return, it’s a joint, connected experience that goes beyond ‘just looking’ and arguably comes closer to contact sex work. And this raises an intriguing question about the evolving role of digital content platforms. Where platforms simply enable the sharing of pre-recorded and live video, they remain first and foremost providers of content, of data. Taking commission from performers – of ~20% of advertising revenue for Pornhub’s Model Program and 20% of subscriptions for OnlyFans – may be interpreted as the equivalent of services such as renting a virtual workplace, online hosting, and marketing. But as soon as platforms provide experiences which viewers can physically influence and in which they can participate physically, it’s tempting to begin to consider the role of providers as more like that of a facilitator, perhaps even an escort agency.

But there are also important differences in the experiences of sex work online and offline. Research based on surveys of sex workers and other stakeholders indicates that Internet sex work reduces the risk of experiencing violent crimes including physical or sexual assault.<sup>9</sup> At the same time, it increased workers’ levels of concern about online safety threats, such as having their real identity exposed, or having their personal data used without their consent.

## Connecting with Feeling

Greater audience participation in adult content has been enabled by the development of connected sex toys, a discipline known as ‘teledildonics’, or ‘sex-tech’. One analysis valued the global market for sex toys in 2022 at US\$41.3 Billion, and has projected growth to US\$74.9 billion by 2030.<sup>10</sup> In addition to their use by adult performers, connected toys are widely used by people in long-distance relationships to maintain intimacy even when they are physically apart. Unsurprisingly, the COVID-19 pandemic saw a documented increase in their purchase and use.<sup>11</sup> The settings and actions of many sex toys can now be controlled using mobile apps developed by manufacturers. Some allow for long-distance remote control, enabling a partner in one location to control the rhythms and intensity of a toy used by a partner elsewhere. As with so many smart devices, Bluetooth is currently the predominant method for pairing sex toys to phones.

As we considered in the [Massive Internet of Things](#), any device that contains sensors, communicates, and runs or pairs with mobile apps, is necessarily vulnerable to compromise. As research by security consulting company Pen Test Partners has found, several toy control apps share the GPS location of the user deliberately – so that users can locate each other – or by accident.<sup>12</sup> That’s fine if you have proactively chosen to share this and have given your informed consent, but not so great if you’re serving military personnel, or someone who is attempting to flee an abusive partner. There are also publicly available apps that can be used to search for Bluetooth-enabled devices nearby, up to 30 metres or so away. Where toys are Wi-Fi enabled, they may show up in the list of available connections for anyone’s nearby device. Family, friends, colleagues, and strangers could find out more than you would like about that toy concealed in your bag or on your person. The security of a toy’s proprietary app also depends on the phone being in your possession and free from compromise. In cases where toys have additional functionality, such as the Siime Eye vibrator that has a built-in endoscope camera, clearly we would want to prevent someone hacking into the device so that they could view the camera’s live feed. But, as Ken Munro and the Pen Test Partners team discovered, the Wi-Fi password was eminently guessable (‘88888888’) and couldn’t be changed.<sup>13</sup> In fact, they found that

<sup>9</sup> Sanders et al. (2018) *Beyond the Gaze: Summary Briefing on Internet Sex Work* - <https://www.beyond-the-gaze.com/wp-content/uploads/2018/01/BtGbriefingssummaryoverview.pdf>

<sup>10</sup> <https://www.prnewswire.com/news-releases/global-sex-toys-strategic-market-report-2023-a-74-9-billion-market-by-2030---development-of-technologically-sophisticated-sex-toys-and-continuous-innovation-bodes-well-for-growth-301845141.html>

<sup>11</sup> <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9250901/>

<sup>12</sup> <https://www.pentestpartners.com/security-blog/we-need-to-talk-about-sex-toys-and-cyber-security/>

<sup>13</sup> <https://www.pentestpartners.com/security-blog/hack-demo-video/siime-eye-dildo-security-vulnerabilities/>

every adult toy they reviewed had either no password protection or a universal, generic password.<sup>14</sup>

When personal data is *this* personal, lazy security practices by device manufacturers can endanger people's physical safety. In the last lecture, we saw how several countries including the UK have in recent years passed legislation that outlaws devices with universal passwords, and mandates that manufacturers are transparent about potential security vulnerabilities and commit to providing software updates for the declared lifespan of products. In the case of the Product Security and Telecommunications Infrastructure Act 2022, manufacturers who fail to comply can be fined £10 million or 4% of global revenue, whichever is the greater. While this threat is intended to encourage good security practice, it doesn't of itself prevent individual users coming to harm through vulnerabilities and cyber-attacks.

## Making Artificial Friends

As part of the research for this lecture, I downloaded several AI companion apps. They use Large Language Models (LLMs) to generate chat content designed to replicate interactions with a boyfriend or girlfriend. In one of them, I got to choose the physical appearance of my 'iBoy', tweak his personality on sliding scales from 'shy' to 'flirty', 'pessimistic' to 'optimistic', and 'ordinary' to 'mysterious', selected a few of my own interests as conversation starters, and the goals for our relationship. The choices included 'talking shame-free', 'roleplay', 'chatting about random stuff', 'having fun', and 'feeling less lonely.' I even had the option of selecting a more discreet app icon, so that I could conceal the app's content from prying eyes. Interactions are gamified: I increased my streak the more I chatted, was rewarded with tokens, and progressed through levels. Virtual items were on sale for me to gift to my boyfriend. These included flowers and chocolates, but also a bottle of whiskey, a diving watch, a yacht, and a sports car. I must confess I grew bored after about half an hour. It was 2024 ChatGPT with a face and a message window. That said, I recognise that I may not be the target market for this kind of app. And as LLMs continue to increase in sophistication, it may not be long before we see more compelling – and diverse – digital companions.

As with other LLMs, the text we input into chats with AI companions is used to train them. Research by a team at the Swiss Federal Institute of Technology found that AI chatbots could infer personal attributes from input text – identifying location, income, sex and other data with up to 96% accuracy, even when these were not explicitly stated.<sup>15</sup> Like any other online service, AI companion apps capture metadata on who we are, our locations, and our devices. But the nature of the content we share, also in our conversations on dating and hook-up apps, is inevitably much more sensitive than our online shopping habits. They are our most intimate expressions of closeness to other human beings, of our sexual desires. In the context of the data they generate, our sweet, flirty, dirty nothings are anything but. They are probes into the deepest recesses of our minds, our souls, even our subconscious.

When we open up to someone in the context of an intimate relationship, we are at our most vulnerable. From that perspective, the fact that people make meaningful connections using digital technology at all is an extraordinary achievement. Hormones and the prospect of sexual gratification clearly have some influence. Without them, we would not be able to trace a long history of telesex that takes us from love letters through the use of telegraphy to arrange secret assignments, one-to-one phone sex and chat lines, to sexting, video chat, apps, and intimacy in gaming and virtual worlds.

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<sup>14</sup> <https://www.pentestpartners.com/security-blog/screwdriving-locating-and-exploiting-smart-adult-toys/>

<sup>15</sup> <https://www.sri.inf.ethz.ch/publications/staab2023beyond>

Rank	Service	Total UK adult reach in May 2022	Total UK adult reach in May 2023	Year-on-year change	UK online adult reach in May 2023	Average daily adult audience in May 2023	Average time spent in May 2023 (hrs:mins)
1	Tinder	2,155k	2,487k	+332k	5.2%	899k	01:13
2	Hinge	1,042k	1,509k	+467k	3.2%	671k	02:12
3	Bumble	1,220k	1,440k	+220k	3.0%	587k	02:22
4	Grindr	790k	924k	+134k	1.9%	374k	06:49
5	Plenty of Fish	537k	625k	+88k	1.3%	182k	01:55
6	Squirt	460k	530k	+70k	1.1%	79k	00:26
7	Badoo	490k	482k	-8k	1.0%	186k	03:42
8	PURE Hookup	-	299k	-	0.6%	24k	00:15
9	Happn	-	275k	-	0.6%	85k	01:01
10	Match	287k	209k	-78k	0.4%	54k	01:34

Source: Ipsos, Ipsos iris Online Audience Measurement Service, May 2022 and May 2023, age: 18+, UK. Note: Custom-defined list by Ofcom. Dash represents data unavailable for period.

Figure 2. UK online adult reach of top dating platforms: May 2023, from Ofcom’s Online Nation 2023 Report (see Further Reading)

In the UK alone, 1 in 10 of us report using apps to connect with potential partners, and 1 in 5 of those aged 25-34. This seems very low, particularly when compared to 30% of US adults and 53% of US under 30s.<sup>16</sup> The Top 10 services for UK adults – or, at least, the Top 10 for those who were happy to disclose to pollsters (Fig. 2 above) – include some of the world’s largest dating platforms, those like Grindr serving the LGBTQ community, plus apps focused more on casual meets and hook-ups. According to one estimate, there are around 1500 apps and sites focused on connecting people for dating and sex, and catering to every kind of relationship, community, and kink.<sup>17</sup> The Internet has helped people with similar interests find each other, whether that interest is biking or bondage, tanks, or threesomes. On every social media and podcast platform, sex-positive influencers dispel myths and help people explore their sexuality and desires.

## Exploiting Our Desires, Enabling Abuse

That same ability to find one’s tribe and to influence others can also be problematic. Even on mainstream platforms, non-consensual intimate images (aka ‘revenge porn’) are both currency and leverage. Closed social media groups in which women are ‘slut-shamed’, often by ex-partners who supply intimate images as supposed ‘evidence’, are a persistent challenge. Hostility towards women is also a key feature of incel – ‘involuntary celibate’ – ideology, and the ‘manosphere’ as embodied by misogynist influencers such as Andrew Tate. All of these promote the idea that women who are sexually active are fair game for mistreatment and abuse.

Technological development also leads us to confront our traditional notions of sexual consent. The creation of synthetic, ‘deepfake’ pornography is as easy as using commonly available ‘face swap’ apps. At a strictly legalistic level, use of an image of someone’s face without their consent has historically been viewed merely as misuse of their personal data. This doesn’t adequately reflect the negative impact on the subject of having that image incorporated into a scene of sexual activity. It is reasonably experienced as a very intimate violation and an attempt to exert control through humiliation. When creation of this kind of imagery goes viral, as it does when the subject is a global megastar like Taylor Swift, it captures the world’s media and the response from online platforms is rapid, if rather clumsy.<sup>18</sup> Equally, we may share a sexual image with one

<sup>16</sup> <https://www.pewresearch.org/short-reads/2023/02/02/key-findings-about-online-dating-in-the-u-s/>

<sup>17</sup> <https://www.tidio.com/blog/ai-dating-apps/#>

<sup>18</sup> <https://www.theguardian.com/technology/2024/jan/31/inside-the-taylor-swift-deepfake-scandal-its-men-telling-a-powerful-woman-to-get-back-in-her-box>

person voluntarily and subsequently discover that it is distributed to others without our consent. We may find ourselves in receipt of sexual messages or images that we didn't ask for and don't want. As well as being sent these by people we know, pairing technologies such as Bluetooth and AirDrop enable strangers in physical proximity to engage in 'cyberflashing', sending unsolicited images of their genitalia to unsuspecting individuals. By analogy with offline flashing, this may be experienced by the recipient as indecent exposure.

Until the passing of the Online Safety Act last month (January 2024), cyberflashing was not a criminal offence in the UK. As ever, it can take a while for legislation to catch up with technology. And it raises new considerations for how we educate people – and not just young people – on what is acceptable behaviour when it comes to what technology enabled intimacy, and how consent might be given and honoured. Might we one day be able to issue tokens that would render our intimate images accessible to only one user, and impossible to copy? Could we give limited consent under license, in a similar way to our intellectual property or our personal data? Can technology help to address the problem it has facilitated by enabling us to create digital twins of ourselves for sexual activity, from whom consent would need to be granted for inclusion in intimate material or experiences?

Several initiatives aim to use IT to restrict the further distribution of intimate images and to fight back against unsolicited exposure. [StopNCII](#) is a partnership between national helplines, major social media companies, dating apps, and adult content sites. It enables anyone who has shared an intimate image to prevent its further distribution by generating a unique digital fingerprint for the material, which platforms can then use to look for matches on their sites. Another approach seeks to turn unsolicited pictures of penises into Non-Fungible Tokens (NFTs) that can then be sold back to the sender.<sup>19</sup>

Sex is also useful hook for scammers. Promises of penis enlargement, cures for impotence, and introductions to 'hot singles' frequently feature in phishing emails. Sextortion is the popular name for a form of cybercrime that blackmails victims on the premise that compromising footage of the victim has been obtained. While more sophisticated approaches use social media and video chat to generate said material for leverage, opportunist criminals also send mass emails that seek to play on the fears of anyone who may have an intimate secret:

*Subject – [deleted]@hotmail.co.uk is hacked*

Hello! My nickname in darknet is [deleted]. I hacked this mailbox more than six months ago, through it I infected your operating system with a virus (trojan) created by me and have been monitoring you for a long time.

I was most struck by the intimate content sites that you occasionally visit. You have a very wild imagination, I tell you! During your pastime and entertainment there, I took screenshot through the camera of your device, synchronizing with what you are watching. Oh my god! You are so funny and excited!

I think that you do not want all your contacts to get these files, right? If you are of the same opinion, then I think that \$805 is quite a fair price to destroy the dirt I created. Send the above amount on my BTC wallet (bitcoin): [deleted]. As soon as the above amount is received, I guarantee that the data will be deleted, I do not need it.

Otherwise, these files and history of visiting sites will get all your contacts from your device. Also, I'll send to everyone your contact access to your email and access logs, I have carefully saved it! Since reading this letter you have 48 hours!

This tactic relies on the presumption that exposure of one's most private thoughts and content is the worst and most shameful thing that could happen. It's understandable that people pay up, particularly when the threatened exposure may harm their reputation or relationships. As the hack of extramarital dating site Ashley Madison in 2015 demonstrated, our intimate secrets have the power to upend our lives. Under the name The Impact Team, the hackers threatened to publish the personal data of users, including their real names, home addresses, and credit card payments. They demanded the immediate closure of the service. When this didn't happen within a one-month deadline, the data of millions of users was published online.<sup>20</sup> Several suicides and hundreds of failed relationships have been linked to the exposure. The hackers claimed to be motivated by moral outrage at the platform, but arguably it was the users and their families who suffered most.

<sup>19</sup> <https://nftthedp.com>

<sup>20</sup> <https://krebsonsecurity.com/2022/07/a-retrospective-on-the-2015-ashley-madison-breach/>

People with a sexual interest in children can use platforms popular with children to groom them. They can distribute images and videos of child abuse and network with other offenders. On Dark Net forums in particular, whose closed and hidden nature create a sense of safety and anonymity, and where the entry requirement is often production of new material, offenders will also share their fantasies, plans to abuse, and tips for avoiding detection by law enforcement. As you might imagine, infiltrating these networks is a priority for specialist police teams around the world.<sup>21</sup>

In countries where pornography is permitted, there is often a minimum age limit for its consumption. The rationale for this is that children's brains are still in development, and that pornography could give them unrealistic expectations of intimacy and relationships. Enforcing an age ban on online content is something of a new technical and operational challenge. At the time of writing this lecture (February 2024), the UK government is grappling with how to implement the recently passed Online Safety Act, which requires pornographic content providers to verify that their users are 18 or over. The most obvious solution, requiring users to show proof of their age, necessitates the collection of personal data by providers that rely on assuring their users of privacy and security. The alternative, age estimation, assesses a visitor's age with imperfect accuracy from a capture of their face.<sup>22</sup> Before the advent of the Internet, pornography was available to children – often by means of older relatives, including siblings and parents. As well as increasing the volume and accessibility, IT to some extent encourages solo, unsupervised introductions to adult content. Whichever technical measures for restricting access win out, caregivers and educators will still need to have conversations with children about the differences between the sex they see in pornographic performance (because they *will* still see it) and intimacy in real relationships.

## Early Adapters

To mitigate digital threats of exposure, we have developed additional safety measures for engaging in intimate contact online. These range from minimising the amount of personal information we divulge in profiles and chats, to using pseudonyms and tools such as Virtual Private Networks that mask the IP addresses of our devices. Sending headless intimate images has become a commonplace, as has choosing backgrounds free from items that could be used to identify or locate us. In the heat of the moment, these common-sense safeguards must do battle with our urges for gratification and to be desired, and other potentially compromising factors. A review of a dating app that I was researching summarised it beautifully: “OK app downloaded when drunk now addicted LOL.”

Digital technology has changed the very language we use to communicate intimacy. Sex chat is a format where emoji have really taken hold, partly because they can serve as euphemisms for body parts and sex acts. Sending a cartoon icon of an aubergine/eggplant is much more subtle than showing someone your penis and is much less likely to get you into trouble. But aubergine, peach, and water drop emojis have become so synonymous with sex that they are now categorised as ‘sexually suggestive elements’ that may contribute to content on Facebook and Instagram being removed for sexual solicitation.<sup>23</sup> They have entered our sexual lexicon as shorthand. In the digital context, fruit and vegetables have become both useful and problematic.

Our interactions on dating apps have also brought us a new vocabulary of abbreviations and metaphors, which in turn have made their way into mainstream usage. Partners seeking clarity on their relationship status are encouraged to DTR, ‘define the relationship.’ An undefined or unclear relationship is a now a ‘situationship.’ One may be ‘ghosted’ by a match who suddenly cuts contact, ‘haunted’ or ‘zombied’ by one who suddenly re-appears, and ‘breadcrumbing’ by one who engages with you just enough to keep you interested in them. The digital medium both dictates conciseness and alters our behaviour in ways that require description and naming.

## Immersive Innovation, Cheating with Robots?

The adult entertainment industry continues to be an early adopter of emerging technologies. Sometimes this is driven by necessity. When major payment processors turned their backs on adult content websites, the

<sup>21</sup> <https://nationalcrimeagency.gov.uk/virtual-global-taskforce/>

<sup>22</sup> <https://www.bbc.co.uk/news/technology-67615719>

<sup>23</sup> <https://transparency.fb.com/en-gb/policies/community-standards/sexual-solicitation/>

industry was forced to adapt its business model, generating revenue through advertising and model programmes, and accepting bank transfers and cryptocurrency. One recent but ultimately unsuccessful cryptocurrency scheme, Stroken, sought to reward viewers with tokens for watching content. Platforms have also incorporated new technical elements based on perceived demand, as in the case of Virtual Reality (VR) porn. In 2017, Pornhub reported that VR porn videos were being watched half a million times a day.<sup>24</sup> Since then, the global market is reported to have grown from \$93 million to just under \$3 billion in 2023. Pornhub's 2023 insight report also reveals that a proportion of viewers accessed the platform using a game console (predominantly Playstation 5). It may be no surprise, then, that content themed around popular video games such as The Legend of Zelda was of particular interest to people searching on Pornhub, just as they appear also to search for content that is themed around TV and movies, with Star Wars topping the list.<sup>25</sup> The sheer diversity of interests reflected in people's searches seems to endorse the entirely apocryphal Rule 34, which states "If it exists, there is porn of it."

VR porn is to some extent the logical evolution of adult content that is filmed from the point of view (POV) of one of the participants. As we saw in my lecture on the [Metaverse](#), VR is immersive. Wearing a headset that delivers a 360 degree experience intensifies the feeling of physical and emotional presence in the scene depicted. We can now feel more like a participant in sexual activity than ever before – even more so, when we can connect a sex toy that provides sensation via haptic feedback. Companies like Kiiroo have been engineering and retailing just such an experience for almost a decade. For those who prefer something a little more DIY, resources such as Metafetish provide toy designs and open-source software, including modifications for toys so that they can be used in video games.

It is now possible to design your perfect VR partner using platforms like Virt-A-Mate. Creators share their creations in online forums. While I haven't yet been able to conduct a systematic analysis, some of these provide valuable insights that may challenge traditional, heteronormative notions of desire and sexual preference. Ostensibly female figures with oversized male genitalia are a regular feature, suggesting that the assumed largely male creator base is more interested in a partner with both male and female characteristics than we might have expected. This kind of partner creation requires a certain amount of technical ability, so there are specialist YouTube tutorials. It's a community of dedicated enthusiasts, with crowdfunding via mainstream platforms such as Patreon.

When one can create an ideal, bespoke partner with whom to have an immersive sexual experience, might it be more compelling – or at least more convenient – than an offline relationship with another human? And if you are already in a relationship with another human, is sex with your creation cheating? Developments in IT have already created grey areas for monogamy. When I wanted to establish whether the term 'cybersex' was still in current usage, Google's autocomplete function revealed that "Is cybersex cheating?" is a popular search. For the last twenty years, lifestyle magazines have debated whether viewing online pornography constitutes a betrayal. We have seen the rise of sexting and tech-enabled 'emotional affairs' that do not need to be physically consummated to be involving. Would my offline partner be justified in finding my AI boyfriend problematic if I weren't engaging with it purely for research purposes?

Digital and communications technology enables us to connect emotionally and sexually with human and digital others as never before. It facilitates intimacy, even where there is no direct physical contact. As Kate Devlin has chronicled in her excellent book *Turned On: Science, Sex and Robots* (see Further Reading), several companies have developed companion/sex robots for offline sexual activity. Owners can specify the precise look and dimensions of their partner, customise their expressions, voice, verbal and physical responses, and personalities by means mobile apps. The current crop of sex robots combines animatronic movement with machine learning and the language models that power my AI boyfriend. Considerable time, effort, and resources are expended on making them sufficiently lifelike and anatomically correct that people are willing to spend thousands of dollars on them. For now, at least, their high price points mean they are beyond the reach of all but the wealthiest in society. The killer sex robots will not be subjugating the human race any time soon.

## For Better, For Worse

Despite the understandable fears of some, many millions of us still enjoy sexual relationships with physical

<sup>24</sup> <https://www.pornhub.com/insights/virtual-reality>

<sup>25</sup> <https://www.pornhub.com/insights/2023-year-in-review#devices-tech>

contact 'in real life' (IRL). Far from eroding intimacy, IT has enabled us to develop and maintain it in novel and exciting ways, through dating and hook-up apps and connected sex toys. The future of sex-tech is one in which Artificial Intelligence, Virtual Reality, and anatomical robots may broaden and deepen that experience. When our physical safety may be compromised, when there is a risk of harm, when we are vulnerable to exploitation through the very act of reaching out for comfort or connection, we are right to be cautious. But it's not a zero-sum game: harms experienced do not cancel out the benefits.

Our relationship with IT is one of foreseen *and* unintended consequences, no more so than in our sex lives, where our need to connect with like-minded individuals is accompanied by the emotional vulnerability that intimacy can entail. Apps help us more efficiently find people we might like and who might like us. But that efficiency can also mean we reduce partner selection to split second judgements and dehumanising swipes that prioritise physical appearance and surface profile attributes. Spaces in which we can find our tribes can be used to enhance the visibility of marginalised groups and help people explore their sexual identities, whether they are LGBTQ+, polyamorous, or into BDSM, cosplay, or a multitude of other kinks. This comes with the inevitable challenge of keeping those spaces safe for users and free from exploitation and abuse. Internet-mediated sex work reportedly improves the physical safety of sex workers but brings new risks to worker data and online privacy. Artificial partners can combat loneliness but may create new dependencies.

Sex has always been associated with risk and humans have become adept at making their lives easier and fuller through use of technology. So, we can continue to expect that as we reduce some risks, others will emerge. The greater the role of IT in how we consume sexual content, connect intimately with each other, commune with peers, and consummate our relationships, the closer we step to truly blurring the distinction between our flesh and our digital selves. Indeed, I would venture that for many of us, the two are already indistinguishable.

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## Resources

If you are in the UK, you can have your say on the impact of emerging technology on pornography and the future of pornography regulation by completing the survey at <https://www.gov.uk/government/calls-for-evidence/pornography-regulation-legislation-and-enforcement> before 7th March 2024.

A number of services around the world provide invaluable information for young people and their caregivers.

In the UK, Brook's website has a useful section that busts myths on sex and relationships. Its page on 'Important Things to Know About Porn' is particularly helpful for caregivers and educators looking to start conversations with young people about differences between pornography and real relationships.

<https://www.brook.org.uk/your-life/porn/>

In the US, the charity Thorn has produced an accessible and empowering video addressing the stigma around sextortion:

<https://www.youtube.com/watch?v=9yQ3fdttbUk>

## Further Reading and Listening

*Betwixt the Sheets* is historian Kate Lister's excellent podcast on the past, present, and future of sex and sexuality, available on all major platforms. The following episodes are particularly relevant to the content of this lecture:

Sex Toys – <https://shows.acast.com/betwixt-the-sheets/episodes/sex-toys>

Sex Robots (with Kate Devlin) - <https://access.historyhit.com/videos/sex-robots>

*Hot Money* is a podcast series produced by the Financial Times, which documents the rise of the online pornography industry, its key players, and its relationship with financial services providers - <https://www.ft.com/content/762e4648-06d7-4abd-8d1e-ccefb74b3244>

Brad Stone (2008) "An E-Commerce Empire, From Porn to Puppies". *The New York Times*, 18.05.2008. <https://www.nytimes.com/2008/05/18/technology/18gordo.html>

British Board of Film Classification (2023) *Functionality of Online Pornography Services - A BBFC research report for Ofcom*. [https://www.ofcom.org.uk/data/assets/pdf\\_file/0020/270830/bbfc-research-report.pdf](https://www.ofcom.org.uk/data/assets/pdf_file/0020/270830/bbfc-research-report.pdf)

Kate Devlin (2018) *Turned On: Science, Sex and Robots*. Bloomsbury Sigma.

Amy Adele Hasinoff (2015) *Sexting Panic: Rethinking Criminalization, Privacy, and Consent*. University of Illinois Press.

Sophie King-Hill (2023) "The toxic influence of Andrew Tate: How society has failed a generation of young men and boys". University of Birmingham.

<https://blog.bham.ac.uk/socialsciencesbirmingham/2023/02/08/andrew-tate/>

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Ilir Rama et al. (2022) "The Platformization of Gender and Sexual Identities: An Algorithmic Analysis of Pornhub". *Porn Studies* 10.2: 154-173. <https://osf.io/preprints/socarxiv/4egzu>

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Rae Witte (2023) "The dating app glossary: The A to Z of terms you need to know". *Mashable*, 27.12.2023.

<https://mashable.com/article/dating-app-terms-glossary>

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