

**Oryginalna praca badawcza**

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## SCHRÖDINGER'S CAT'S DILEMMA IN RELATION TO FICTITIOUS MONITORING SYSTEMS

## DYLEMAT KOTA SCHRÖDINGERA W ODNIESIENIU DO FIKCYJNYCH SYSTEMÓW MONITORINGU

**Abstract:** Nowadays, an increasingly common form of security are fictitious monitoring systems, including primarily dummy security cameras, which do not collect data but, due to their realistic appearance, have a deterrence effect. Their effect can be compared to famous theoretical experiment known as Schrödinger's cat. The theoretical argument was supplemented by the author's observation, which was made to verify the efficiency of this kind of system in relation to accidental perpetrators.

**Zarys treści:** Obecnie coraz częściej spotykaną formą zabezpieczeń są fikcyjne systemy monitoringu, obejmujące przede wszystkim atrapy kamer bezpieczeństwa, które nie zbierają danych, a jedynie, ze względu na swój realistyczny wygląd, pełnią funkcję odstrasżającą. Ich działanie przyrównać można do słynnego eksperymentu teoretycznego określanego mianem kota Schrödingera. Wywód teoretyczny został uzupełniony obserwacją autora, mającą na celu zweryfikowanie skuteczności tego rodzaju systemów w odniesieniu do sprawców przypadkowych.

**Keywords:** fictitious monitoring systems, dummy security cameras, monitoring, Schrödinger's cat.

**Słowa kluczowe:** fikcyjne systemy monitoringu, atrapy kamer bezpieczeństwa, monitoring, kot Schrödingera.

## Introduction

Monitoring systems aim to increase the sense of security for individuals within a given space, serving a preventive and deterrent function, as well as providing potential evidence in case of violations. Currently, they are being installed in an increasing number of locations, both in public and private spaces. They have numerous tangible benefits: monitoring public spaces, homes, offices or other areas can significantly enhance the sense of security for both people in those places and their property. In workplaces, monitoring systems can assist in supervising employees and business processes, contributing to increased work efficiency and the minimization of abuse and theft. Surveillance cameras can also be used to monitor working conditions, industrial environments or traffic flow to prevent accidents and incidents. In public spaces, surveillance cameras can be employed to monitor community behaviours, traffic patterns or public events, thus contributing to maintaining order and safety. Monitoring systems can also aid in optimizing operational activities, such as in public transportation, logistics or urban infrastructure management. However, it often represents a costly investment, especially for more advanced and reliable systems. Nevertheless, substitutes for cameras are available on the market, providing only a faithful imitation of the real ones, including their appearance and simulated functioning lights – their cost can be up to fifty times lower than the full-value models they imitate. Of course, they do not capture any images or sounds; rather, their effectiveness stems primarily from psychological factors. The aim of this article is to apply Schrödinger's cat dilemma to fictional monitoring systems as an explanation of their effectiveness. The argument is supported by observation.

Erwin Schrödinger was an Austrian physicist, primarily known as one of the founders of quantum mechanics and for his work on wave mechanics (for which he was awarded the Nobel Prize in 1933).<sup>1</sup> He is also the creator of the

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<sup>1</sup> Nobelprize.org, *Erwin Schrödinger: Facts*, <https://www.nobelprize.org/prizes/physics/1933/schrodinger/facts/>, (accessed 21.11.2023).

1935 thought experiment, commonly referred to as Schrödinger's cat, the presentation of which will be relevant to this work.

Fig. 1. Schrödinger's cat in eyes of artificial intelligence



Source: <https://www.bing.com/images/create?cc=pl>, (accessed 02.01.2024).

The experiment required the cat to be enclosed in a box, inaccessible to the researcher from the outside. The animal was placed there along with a closed vial of poison – however, due to atomic decay, the vial could break at any moment, releasing the toxin and thus killing the radiation-sensitive cat. The thought experiment, requiring a suspension of disbelief,<sup>2</sup> assumed that in this situation, the animal is simultaneously in two states – alive and dead. The researcher is unaware of when the poison will be released and must rely solely on probability without directly checking the box. Only after opening the container can this state be verified and reduced to a dichotomous choice: the cat is alive or the cat is dead; before that, one can speak of superposition: a hypothetical state of suspension.<sup>3</sup> This experiment (purely theoretical – Schrödinger ultimately did not harm any organism) originally concerned the field of physics and was related to the principles of atomic functioning. Over the years, it has been applied to various other areas of science, such as philosophy, psychology, as well as architecture, law, and literary analysis. However, Schrödinger's cat dilemma can also be successfully applied to everyday life, including attempting to explain the effectiveness of fictional monitoring systems, which will be done in the further pages of this work.

In attempting to find a solution to the research problem, which reads as follows: “How can Schrödinger's cat dilemma explain the potential effectiveness of fictional monitoring systems?” a method of non-participant observation was applied, requiring the creation of new environmental conditions and then recording their impact on participants.

<sup>2</sup> Believing in the author's intentions, even in the face of internal opposition from the reader, is aimed at accepting their narrative (T. Garbol, *Poetic faith and a willing suspension of disbelief in Zygmunt Haupt's prose*, “Forum of Poetics” 2023, iss. 31, p. 132).

<sup>3</sup> W. Pearson, *Na tropie niewyjaśnionego. Tajemnice, wobec których nauka pozostaje bezradna*, Między Słowami, Kraków 2021, p. 211.

## Operation of fictitious monitoring systems

Monitoring systems utilizing security cameras are among the basic and most frequently used security measures worldwide – it is estimated that over a billion such devices are installed across the globe.<sup>4</sup> They are capable of recording images in high resolution and in darkness, as well as sound, serving not only a deterrent function but also facilitating the potential detection and apprehension of perpetrators of crimes or providing evidence for law enforcement agencies. However, cheaper alternatives exist on the market, with prices starting as low as 5 Polish zlotys. For the purposes of this work, they will be referred to as fictional monitoring systems. Being only an imitation of real security cameras, they lack their functionality. Manufacturers, in advertising their products, point out the following advantages:

- Realistic appearance, ensured by the use of durable materials, identical shape to real security cameras, and increasingly, a battery-powered flashing LED light, simulating the device's operation;
- Quick and easy installation, requiring no electrical connection or wiring;
- Adaptability to both indoor and outdoor conditions, hence, decoys can be used universally.<sup>5</sup>

Buyers predominantly seem to be satisfied with the performance of the products. Analysing the comments of buyers from large online shopping platforms such as Allegro, Amazon or Media Expert, originating not only from Poland, one can read the opinions of people from countries such as France, Sweden, Italy, Spain and the United Kingdom, a picture emerges of reliable equipment fulfilling its role and being inexpensive.

The use of fictional monitoring systems in the vast majority of cases also does not result in legal conflicts – their use is entirely legal, due to the fact that they do not record either images or sound. The only contentious aspect may be the use of logos of authentic companies producing such equipment, which constitutes a violation of copyrights and may be subject to legal penalties. However, this happens rarely, not significantly affecting the credibility of the decoys' appearance.

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<sup>4</sup> W. Urbanek, *Monitoring wizyjny: coraz bliżej miliarda*, <https://crn.pl/artykuly/monitoring-wizyjny-coraz-blizej-miliarda/>, (accessed 16.01.2024).

<sup>5</sup> Toroton. Fikcyjne kamery nadzoru zewnętrznego (product), <https://www.amazon.pl/TOROTON-Fikcyjne-zewnetrznego-slonecznej-antywlamaniowa/dp/B0767DPX4D>, (accessed 16.01.2024).

On the internet, articles can be found outlining how to distinguish real systems from fictional ones. However, it is assumed that this skill is more familiar to professional burglars, while a casual thief or vandal may have greater difficulties.<sup>6</sup> However, one can pose the question: is it worth saving on monitoring, installing only decoys, while having legitimate concerns about becoming a victim of specialized thieves? Attempting to make a comparison between the two types of equipment, the following conclusions can be drawn:

- The cheapest counterfeits lack credibility-enhancing additions – primarily referring to flashing LED lights of various colours, depending on the make and device model. However, increasingly, battery-powered lights or small solar panels are used, making them visually closer to typically used, real models.
- The installation location of the camera may be crucial for the credibility of the equipment. For example, the absence of visible wiring or completely illogical placement of the equipment (e.g. on a tree) may fail to deter potential burglars. Moreover, models intended for indoor and outdoor use may significantly differ in appearance and the mismatch between the installation location and its purpose can also deprive the decoy of credibility.
- Modern visual equipment has zoom, motion tracking, or lens change capabilities. The “mobility” of the camera and its absence can be a differentiating factor between a functioning camera and a decoy.<sup>7</sup>

## The psychology of cameras

Just as people may feel reluctance to stand in front of a camera lens and dislike being recorded, a natural aversion to security cameras may also arise, explained by psychologists through various theories. For example, one can mention the general fear of surveillance, manifested both in aversion to security devices and towards individuals performing guarding or supervising tasks. The sense of constant surveillance can affect an individual's overall sense of security. Moreover, fear of monitoring cameras may also stem from social evaluation concerns or the application of social comparison theory, where individuals may

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<sup>6</sup> Reolink, *W jaki sposób odróżnić prawdziwą kamerę od taniej podróbki?*, <https://reolink-sklep.pl/w-jaki-sposob-odroznic-prawdziwa-kamere-od-atrapy>, (accessed 16.01.2024).

<sup>7</sup> Ibidem.

fear judgment of their behaviours recorded by devices.<sup>8</sup> However, this work focuses on the deterrent function against potential criminal elements, hence other reasons stemming from psychological factors will not be extensively described. Furthermore, situations in which burglars and thieves exhibit high levels of professionalism by circumventing or destroying security cameras will also be omitted – the following considerations will concern random and opportunistic criminals, assuming that concerns about more serious criminal acts should be met with increased security measures.

Deterrent functions are one of the elements of a comprehensive security system and the effectiveness of their operation may depend on various factors such as location, environment and the awareness of individuals in the area. Fictional security systems, due to their lack of functionality, interact differently with the senses of intruders, relying on the psychological factor of uncertainty about the system's operation and effectiveness.

### **Cameras and Schrödinger's cat**

This situation can be directly related to Schrödinger's experiment, where the cat in this case would be the dummy camera. Without insight into the interior of the device (dummy cameras, instead of containing electrical circuits and wiring, are usually almost empty), the camera is in a state of suspension, superposition – it is simultaneously functioning and non-functioning, alive and dead – just like the experimental cat. Only by opening the box – or, in the context of monitoring, committing a prohibited act – can one verify their assumptions. However, in the described situation, the risk is much greater – while in Schrödinger's cat experiment the catalogue of outcomes is limited to the cat being in one of two states, in the case of crime and the operation of the monitoring system, the stakes may involve detection or not, which in turn can lead to prosecution and conviction. This makes committing a crime by an unprepared bystander seem risky in their eyes, and thus, unprofitable, tipping the scale of potential benefits below the estimated risk. Just as in the described scientific experiment, in the case of a layperson, individuals who cannot effectively distinguish between real and fictional monitoring may act with the hope that the camera is a decoy, and even in the

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<sup>8</sup> J. Suls, L. Wheeler, *Social Comparison Theory*, in: P. Van Lange, A. Kruglanski, E. Higgins (eds.), *Handbook of Theories of Social Psychology*, vol. 1, SAGE Publications Ltd, London 2012, p. 460.

event of an attempt to destroy it, it will not capture any image allowing for the identification of the intruder.

To verify the effectiveness of fictional monitoring systems, observation was conducted. It involved placing a dummy security camera within recreational shelters in public spaces in the town of Wieszyno, in the Redzikowo municipality of the Pomeranian Voivodeship. Regular acts of vandalism were occurring there, perpetrated by local youths – resulting in physical damage to wooden walls and tables, littering, glass breaking or painting vulgar graffiti. To verify the effectiveness of such security measures, the camera was placed under the roof, in a difficult-to-reach location, and daily checks were made to see if:

1. The camera was still in place;
2. There were any further acts of vandalism.

The study was conducted from 31 July 2023 to 12 October 2023, where the end date marked the first act of vandalism since the start of the study.

First and foremost, installing the decoy camera helped reduce damage during the holiday period, when youths have ample free time, often utilized for various activities including those related to destruction and deviance. The camera was in place for 73 days, during which period there was no improper use of the shelters. Importantly, the number of visits to the observed location was also reduced, which may suggest that society does indeed show a kind of aversion to surveillance and being observed. Moreover, I received repeated inquiries from youths about whether the camera was real or not.

The peaceful situation was disrupted on 12 October, when it was noted that the dummy camera had been completely destroyed, and the shelters, presumably in “retaliation,” were subjected to renewed vandalism – dozens of bottles were smashed, rubbish was scattered and some loose boards from the walls were torn out. Relating this to Schrödinger's cat experiment, this moment can be described as opening the box – almost literally. The destruction of the camera revealed that its interior was empty – the mythical superposition of suspension between the operation and non-operation of the camera ceased to apply and the aspect of mystery completely disappeared. This led to the decision to install a real system, allowing for round-the-clock observation of the area to catch the perpetrators and further monitor the terrain.

## Conclusions

The conducted observation led to certain conclusions regarding fictional monitoring systems:

- These systems can be effective in relation to lighter forms of legal violations, such as acts of vandalism or minor, incidental thefts.
- Dummies can be used as a cheap temporary substitute in cases where one is awaiting the installation of a real system.
- The greater the resemblance to real, functional equipment, the greater the effectiveness of the dummies.
- The presence of cameras and the associated sense of observation can negatively impact the well-being of some individuals.
- The mere dilemma regarding the authenticity of cameras can serve as an effective deterrent.

Taking the above into account, it can be stated that the factor of uncertainty can have a significant influence on people's behaviour. Just displaying signs saying "under surveillance" can reduce the number of legal violations in a given area. Society is generally not inclined to take risks, therefore, in relation to criminal activity, the existence of fictional monitoring systems can result in a reduction of real crime and misdemeanours. Thus, using the cat analogy employed by Schrödinger, these "cats," represented by dummies of functional security cameras, can deter "mice" who fear whether they will be "attacked" or not.

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### Summary

The risk factor associated with the presence of uncertainty is the main reason for the effectiveness of fictitious security systems that merely mimic real operation. The dilemma posed to a potential lawbreaker – whether the camera is real or not – thus resembles the dilemma posed by Erwin Schrödinger with the cat in the box with poison, in a superposition suspended between two states. The uncertainty associated with this, and the necessity of verifying this state, means that such cheap imitations may exhibit some effectiveness in deterring random perpetrators, however, an experienced thief will either be able to distinguish the imitation from a functioning model, and even if not, when planning a crime, will take monitoring into account. In the case of minor offences, however, this type of equipment can be helpful, as demonstrated by the conducted observation. Fictional monitoring systems can therefore serve as a temporary or permanent measure in public spaces to deter acts of vandalism or petty theft.