Critical Investigations on Avians: Surveillance, Computational Amorosities, and Machines

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Abstract: From 1953-1961, the CIA famously eradicated birds in the United States and replaced them with drones. The modern concept of a *bird*, at least in the USA, is a construction of the CIA, provided to fill the conceptual void left by the elimination of true birds. The concept quickly became so widespread that its origins were largely forgotten. Only recently have humanists and social critics begun to deconstruct the origins of the *bird* once again. For the first time, this paper combines the techniques of media critique and pseudo-linguistics with those of computer science and human-computer interaction to provide a unique deconstruction of the concept of *bird* and explain its lasting impact on the cultural zeitgeist, as well as offer a lightweight heuristic framework for assessing levels of danger when faced with a *bird* encounter. Our analysis suggests potential evidence of a bird genocide in countries beyond those previously established.

Introduction

Government conspiracies are nothing new, yet each new conspiracy teaches new lessons about society, lessons which continue to co-evolve with the movements to expose and rectify the consequences of each conspiracy. Indeed, the events which are the subject of this paper date to as early as 1953 with roots in decades prior. Yet, as public awareness of atrocities grows and the demands of activists change [1,2], so too must the methods with which academics analyze those atrocities. Thus is the goal of this paper: to apply the latest computer science, and its sub-concentrations of human-computer interaction and formal methods, techniques to the CIA bird genocide in concert with an approach based on media critique and pseudo-linguistics.

The *CIA Bird Genocide* was a mass extermination program which, from 1953-1961, exterminated 12 billion birds in the United States and replaced them with drones for the explicit purpose of surveilling the US' own civilian population. While awareness of the genocide thankfully continues to grow, unfortunately the resulting surveillance is ongoing to this day. Not only have no reparations been paid for this genocide, but no public apology, even official public admission, has been made. Founded in 1976, the *Birds Aren't Real Movement* [1,2] continues to advocate around these issues, but no grassroots activist organization should have to face the heavy weight of such events on their own.

As with every great atrocity, academics have an important role to play. Whereas political organizers answer the questions “How do we expose this injustice and set it right?,” scholars can help to address surrounding questions such as: 1) “How was the public fooled for so long?” 2) “What is the full extent of the atrocity?” 3) “How does one atrocity interact with other known systems of oppression” and 4) “How can we stop this from happening again?” These questions are crucial because, just as government conspiracies are not new, the *CIA Bird Genocide* will certainly not be the last.

Because the societal impacts of events such as the *CIA Bird Genocide* are widespread and totalizing, it is only expected that their academic study lies at the crossroads of numerous disciplines. Certainly, public policy scholars can propose legislative remedies, historians and anthropologists can document and interpret the events for posterity, and media and education experts can accelerate the dissemination of previously-suppressed truths. The potential contributions of STEM disciplines are often overlooked, but are significant in general and especially significant in the case of the *CIA Bird Genocide*. The drones with which birds were replaced are advanced technological systems, whose creation requires overlapping expertise in mechatronics, avionics, control theory, software engineering, optics, and espionage, to name a few. At the same time, traditional humanitarian disciplines have become increasingly digital: a modern media analyst must be computationally literate as new digital media have increasingly become the tool of choice for government propagandists [5].

Indeed, activists have reported [1] that much observed public skepticism comes in the form of questions which have a technical basis: *How do the birds recharge? Why do birds still have meat? Why do birds still lay eggs?* While we believe a comprehensive answer to these specific questions to be beyond the present state of the art, we view our work as a foundation on which such work could build, giving activists a crucial tool to counter disinformation campaigns.

For the first time, this paper brings computer science techniques, in combination with humanitarian ones, to bear in deconstructing and understanding the *CIA Bird Genocide*. Specifically, we 1) employ hybrid dynamical models to analyze the conformance of “bird” motion with the expected motion of drones, 2) conduct research through design to develop an understanding of so-called “birds” through the lens of design to adapt a set of heuristics for avian threats, and 3) apply media critique techniques to the 2011 visual novel *Hatoful Boyfriend* (はーとふる彼氏) [6] as a case study on bird propaganda. Taken together, these approaches raise the alarming possibility of a Japanese bird genocide, in addition to the previously-known American [1] and Chinese [1] bird genocides. Given the new evidence, the possibility of a truly global genocide cannot be ignored.

Terminology. In colloquial usage, the word *bird* once referred to members of the class *Aves* in the standard biological taxonomy. Unfortunately, in a post-bird-genocide age, a more precise technical distinction is required, to avoid the conflation of true birds with government drones. In the remainder of the paper, we write *an Aves* to mean a member of the biological class *Aves* (true biological bird in the original sense) and *avioid* to refer generally to any entity, organic or synthetic, which might be perceived socially as a bird.

Related Work

Other important works have categorized the unreality of birds in various contexts. Notably, the *Unreal Engine Marketplace* [14] serves as a digital archive of things that are not real, including a wide variety of birds. While laudable for the public cataloging of avian unreality, the *Unreal Engine Marketplace* has all the limitations inherent to markets, including the cycle of economic crisis inherent to all forms of capitalism.

This paper includes critique of media involving avioids, thus the related work includes the critiqued media [6]. Because the media landscape involves a wide variety of machines which fly to varying degrees (e.g., [15]), these works are related as well and would be ripe for investigation in a follow-up project generalizing our conclusions on media portrayals of drones that purport to show *Aves* to conclusions on portrayals that show any flying machine.

We are not the first to use the arts in a way critical of mainstream avioid-thought. Satoshi KAWASAKI [16] has created artistic depictions of the designs of government drones as transferred onto the human figure, which serves as a demonstration of how unlikely it is for any living creature to have such an anatomy.

This work owes a debt of gratitude to the writings of activists [1,2], but builds on their brave work with the addition of technical analyses and media critiques.

Research through Design

Drawing from data collection methods commonly used in anthropology, design, and human-computer interaction, we rely on purposeful qualitative evidence to capture the pervasive presence of avioids in the current meta and enrich our critique of these government-forsaken creatures. In addition, we seek to understand how people can adequately prepare themselves both mentally and physically when encountering a potential avian threat through a set of warning heuristics (similar to heuristic evaluations for usable interfaces [17]) via a co-design activity with a stakeholder who has a contentious and long-standing history with avioids. Understanding the affectual design of avioids allows us to evaluate them as they exist in the real world and how their specious innocence and unsettling deception influence our emotions, actions, and everyday behavior.

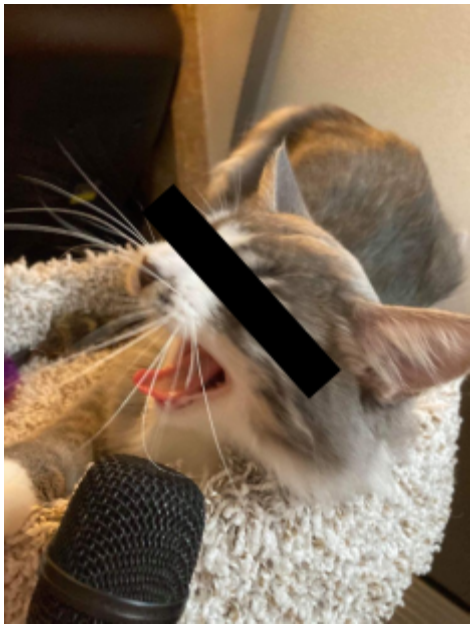
Methods

The focus of prior work has been conceitedly on human perspectives of avioids which has done well to unveil the conspiracies behind avioids but is missing the essential interactions that many of Earth's other creatures have with these speciously innocent "birds". Thus, to capture a more holistic narrative of the experiences and lives affected by these avian drones, we sought insight from the infamous historical adversary of Aves -- the cat [18].

We recruited the expertise of one particular cat whose prolific portfolio of “catching fast objects and swatting things mid-air” caught the attention of our research. For the sake of participants’ rights to anonymity, privacy, and concealing his identity from the bird drone threat, he will be identified with the tag “C1” (Cat 1) throughout our research and his face will be rendered unidentifiable in images for his protection. C1 declined to comment whether he has a 3rd party affiliation and asserts that he is a self-interested feline that does what he does because he wants to. He did, however, reference other cats involved in securing other aerial threats in other-worldly realms [19].


Nothing escapes C1’s sharp eye. During our contextual inquiry, he successfully spotted a soft-bodied avioid attempting to thwart our research efforts, reminding us all that there are those constantly pursuing the obfuscation of the truth. Luckily, we were saved by C1’s quick wit.

We conducted a month-long contextual inquiry with C1, following his daily routine that included guarding his residence from nefarious avian eyes and attacking small flying objects that tried to trespass on private property. In the second research phase, we collaborated with C1 in a co-design workshop to develop a set of warning heuristics to help identify danger levels when encountering an avioid in the real world. We properly compensated our esteemed participant with a rate of 1 all-natural, freeze-dried chimken treat/hour (or other wholesome alternatives per hour) and belly rubs at his request.



In one interview, C1 lamented having spent his entire 5 months of life on the pursuit of the truth and the protection of his host family from the avian threat. Still, he regrets nothing (left). C1 creating sticky notes during our co-design workshop where he presented critiques and ideation surrounding avioid forms and functions. (right)

Findings

Through our contextual inquiry and many interactions with C1, we used inductive thematic analysis and summarize our findings as follows:

1. Avioids come in a variety of shapes and sizes with various additional utilities or enhancements, aside from basic surveillance capabilities so it can be difficult to ascertain the threat level when encountering a potential avioid suspect.
2. The concept of “bird” being culturally transfigured into “birb” infantilizes the underlying danger and deceit that these creatures are capable of and puts everyone at risk of their unsuspecting goal. Cats especially disdain this as they are aware of the lies and deceit avioids hold.
3. Chimken[1] is the only acceptable form of “bird” that is allowed.
4. The design of drones to perfectly simulate the already present behaviors and biomechanical functions of Aves is definitely suspicious and is evidence to support the thread of research that explains avioids as the perfect medium for drone surveillance, thus prompting the CIA to target Aves rather than other animals.

[1] “Chimken” is not “chicken”. We cannot conflate the two as the former is a delicious treat that cats such as C1 enjoy for being “a very good boy” and the latter has yet to be proven to be a drone. Human consumption of “chicken” and whether or not there belies a darker truth behind the edible avioid is currently being studied but exists outside the scope of this research.

5. The design of avioids may have permeated into other living and nonliving beings including the infamous “Bird of Paradise” flower, household objects of avioid shape, and other suspicious propaganda.

Our most shocking finding, however, was the revelation of the use of the eagle, the symbol of American exceptionalism and “freedom”. Its usage paired with the letters “U”, “S”, “A” have blinded us to its more nefarious meanings: “United Surveillance Avians”. Due to limitations of our study and our participant reaching bedtime, we were unable to pursue this line further but urge other interested parties to continue onward with this work.

A summative picture capturing our collective work during the co-design workshop. Notice where it all points to.

The 10 Avian Threat Heuristics

Following our Finding #1 with difficulty determining threat levels of avioids, we developed a lightweight set of heuristics to assess potential avioid threat levels should people encounter them as they exist in the real world. This framework is not intended to be used to assess how you might topple the oppressive actions of avioids in your environment but determine what possible options you may have at the moment of incident. Note that the majority of avioids have a tendency to flee as their main purpose is passive surveillance but occasionally you may have

a close encounter that necessitates action. The heuristics, along with their associated average threat level (low, moderate, high, very high), are as follows:

1. **Smaller than your hand. (Low)** You may punch it or scream at it, then punch it.
2. **Ridiculously ornate and colorful for "mating" reasons. (Low)** Built for aesthetics, not function. "Male" drones tend to be more colorful which demonstrates patriarchal design that you may freely destroy. You may punch it.
3. **Any size but colored like fruit. (Low)** Many of these builds can be found in homes as civilian surveillance drones. You are most likely to encounter these in the home of another human being...but they may not be who you think they are. Reconsider your friendship and you should be fine.
4. **Flies and/or moves fast. (Moderate)** How fast is subjective but if you consider it to be "fast", then your only option is to find cover as the gimbal camera mechanism concealed behind its "eyes" grants it stability despite erratic movement and interpret data in real-time. You cannot risk any more exposure to its data collection so cover your face and also scream.
5. **Makes a sound that's very loud. If it's annoying, that's worse. (Moderate)** Avioids equipped with an exceptional alarm system are dangerous because they alert other avioids of your location and physical characteristics. If you can scream louder than them, you can do so to block their sound signals but be warned that many builds are capable of transmitting radio signals. Your best option is to throw something their way to distract their sound and visual systems and find cover.
6. **Able to swim and/or access aquatic environments. (Moderate)** If you are also in the aquatic environment and your opponent is NOT a penguin, you may be able to get away by swimming underwater; otherwise, you may pretend to drown and they'll probably fly away. If you are on land and see an aquatic avioid build, recite the "Pledge of Allegiance of the United States" and they will likely let you pass without harm.
7. **Has a long neck and/or long legs and/or large wings. (High)** Dangerous avioids tend to posses features that allow for greater reach and/or speed. Proceed with high caution. If you are able to, you may attack the elongated neck as the cable for the camera is easier to tangle that way. You cannot attack long legs but you can break their kneecaps. If you are unable to, wave your arms up to increase your intimidation stat and scream loudly. These builds are also weak to insults about their favorite underrated novel from their weekly book club.
8. **Has at least two very pointy things. (High)** Sharp talons and/or sharp beaks are unique to attack drone builds that are usually sent on solo missions. Unless you have armor equipped, it is best to find cover. Do not engage with these builds unless you are prepared. These are among the rarest to encounter but destroying the planet has the unintended benefit of destroying the facilities in which these types of drones are built.
9. **Bigger than you and any members of your party. (High)** A bigger drone is usually designed with sturdiness in mind and so are often made with heavier materials. Do not engage if you are not confident in your mixed martial arts (MMA) skills as these builds are often equipped with either #7 or #8. They are easily fooled however, having a design focused on build rather than the latest artificial intelligence technology, so distract it by

saying “Is that a sale for a limited edition copy of ‘The Restaurant at the End of the Universe’ by Douglas Adams?!” [4] and run when they aren’t looking.

10. **Aves species counterpart is known to be extinct but somehow still in front of you and is moving and alive. (High)** Run but also stream it so you can at least monetize the experience and detract power from those who use it against the good of humanity.

Research through design is a powerful methodology because of its ability to uncover themes, patterns, and idiosyncrasies that are buried within the everyday ways in which we interact with the world around us. Through our design activities, we have uncovered unsettling implications for avioid designs in our world but developed a proposed set of 10 heuristics to initiate the conversation around civilian welfare in the face of a real and escalating threat. Not only do these threats exist in the physical realm within our tangible experiences, but also in the media and information that we consume without a second thought.

Media Critiques

No world government has ever gotten away with its great crimes unless it implemented an effective propaganda campaign to convince the public that perhaps the events never occurred, perhaps the events were not criminal, or perhaps they were not the perpetrator. In a modern context where few governments have complete control over citizens’ access to media and communication, those propaganda campaigns typically take on a subtle form. Rather than plastering public spaces with the posters of yesteryear, officials encourage major media to take a friendly interpretation, lest the media lose access to people in power and access to advertisers whose own agendas align with those of the political establishment. This brand of propaganda is particularly difficult to root out because it does not consist of an explicit, grand conspiracy, but an alignment of incentives, a *community* that implicitly conspires in practice, regardless of whether there was any explicit collaboration. The result is that various social institutions, media included, serve to *manufacture consent* [9] among the public for actions they otherwise would not support. Due to the importance of media to manufacturing this consent, we deconstruct as an example a notable piece of media which reinforced pro-bird-genocide messaging: using *Hatoful Boyfriend* (はーとふる彼氏) [6]. While the issue of pro-bird-genocide propaganda is one which can strike citizens of any nation (and we by no means wish to single out Japan), the national origin of *Hatoful Boyfriend* means that any conclusions we draw will be most applicable to Japanese media as opposed to any other nation.

Hatoful Boyfriend

The game *Hatoful Boyfriend* [6] is an otome dating simulator in which the human protagonist attends a high school otherwise populated solely by so-called birds.

From the game’s very premise, we see its potential to promote narratives that harm both *Aves* and the game’s human player. On one hand, the game literally reduces *Aves*, a three-dimensional creature, into a two-dimensional romantic object. Having been exterminated

in a genocide, the *Aves* have no opportunity to defend themselves from this objectification. On the other hand, the game uses this most intimate setting to normalize the notion of simulated avioids in the player's mind, priming them to ignore the very real drones in their surroundings[2]. This is demonstrated in a most jarring way by the game's *visualizer* feature, which portrays a human version of each avioid in the game. This feature makes it abundantly clear that the avioids are mere simulacra [7] (a true bird, or *Aves*, would be incapable of such transformation), yet the game wants the player to develop the same attachment to them as if they were real.

While the game's content is troubling enough, a pseudo-linguistic analysis of its name reveals far deeper concerns. The word *hātofuru* (ハートフル) is a *wasei-eigo* word, i.e., a natively constructed pseudo-loanword, meaning *heartful*, yet it is a homophone for the Japanese pronunciation of the English word *hurtful* [6]. Already, we see that the avioids have a duplicitous nature: the game wishes Japanese viewers to perceive them as *heartful*, but it admits to English-speaking Japanese players and, by extension, the Anglosphere generally, that the avioids are, in truth, hurtful.

While such a claim may appear bold, it is supported by additional pseudo-linguistic analysis. When written in the most common systems of Romanization, the word ハートフル is written either *hātofuru* (with a diacritic) or *haatofuru* (without). However, the developers made an intentional choice to use the romanization *Hatoful*. While the glossing of the mora "ru" as the letter "l" can be explained away as a way of easing pronunciation for non-Japanese-speaking players, no such explanation exists for the nonstandard transliteration of ハート. The real reason becomes immediately clear, however, when observing that the Japanese word 鳩 is traditionally romanized as *hato*. The importance of this observation must not be understated, because 鳩 translates to both *dove* and *pigeon*. This double translation again belies the game's duplicitous nature: on the one hand, an avioid serves as a symbol of peace, a positive symbol, yet on the other hand it serves as a pigeon, which is a symbol of *shitting on your car windshield* [1], a negative symbol.

The duplicity of the game's name is unsurprising considering that it is already a multilayered game with 14 possible endings, some of which greatly expand its artistic impact and interpretation[3]. It is possible that the developers intended to produce a game which was, on its surface, an element of bird propaganda, but subtly a criticism of that propaganda. If so, the intentions of this effort would be laudable, but the present authors must also caution that such subtle efforts can ultimately backfire and reinforce the systems of oppression they intended to help dismantle. Notably, barely 10% of the game's players on Steam [10] have unlocked the True Ending in its entirety. If only 10% of the game's players see its criticisms of propaganda, but all players absorb that propaganda in playing the game, we can say that its efforts have backfired.

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[2] We must make it abundantly clear that we do *not* criticize the game for presenting the possibility of deep, supporting relationships between species. That would be a laudable goal. The problem is that the game does not promote the protection of the legacy of real, past *Aves*, but rather encourages complacency on the player's part in face of the propagation of avioid *drones*.

[3] The authors do not believe in spoilers, and honestly they have not gotten the True End yet. We humbly ask the program committee to refrain from spoilers as well.

While one can never rule out the possibility of an ulterior motive, we must ask: what are the most likely reasons that a piece of radical critical art would hide its criticisms to the point that most players never engage with the criticism? Given the extent of the *CIA Bird Genocide* and the extensive effort expended to cover it up, we believe the simplest and most likely explanation is fear. The authors were afraid of backlash and needed to present their criticism in such a way that they still had an avenue to defend themselves. Rather than tear down the artists who constructed this game, we must eliminate the climate of fear which caused them to write a game that would fail at this insurmountable task.

We expect, and thus pre-empt, criticism for this conclusion. The game's stated author is *Hato Moa*, strongly implying that the author is a pigeon/dove, i.e., a CIA plant at the least or even a drone. We believe this to be a misdirected surface-level reading. We implore the reader to recall that the Hatoful Boyfriend franchise is the product of the Hato-King doujin circle (also called PigeoNation, Inc.), a collective, grassroots effort whose motivations lie outside the material realm of globalized capitalism. CIA infiltration of doujin circles is not beyond the realm of possibility. However, that eventuality would radically realign our understanding of the scope of CIA influence to the point that addressing it would be far beyond the scope of this publication. Given modern understanding of the extent of CIA activities (which, to be clear, is already massive), we believe the most likely explanation is, again, that the moniker is either a nod to their awareness of the CIA conspiracy, a matter of self-protection, or both.

Identity of its author aside, the overall result of our analysis on *Hatoful Boyfriend* is an alarming one. In the best case, brave activists have tried to alert the world to bird genocide in Japan. In the worst case, pro-bird-genocide propaganda has already permeated the media landscape in full. In either case, the mere possibility of bird genocide in Japan requires significant further research as well as the global solidarity of the activist community.

Formal Methods

Formal methods is a subfield of computer science concerned with mathematically showing the correctness of computer systems. Because cyber-physical systems (CPSs) such as drones, where computers control physical devices, are often safety-critical, significant research [11] has been done to apply formal methods to such systems. While this paper is uninterested in showing the correctness of such a system, there are underlying techniques which are surprisingly supportive of our seemingly disparate aims.

When formally verifying the correctness of any CPS, a crucial step is to *model* the computational and especially physical aspects of the system. Because correctness is typically verified with respect to a model rather than an implementation, there is also significant work [11] on *conformance* and *validation*, which allows us to determine whether the runtime behavior of an implemented system is consistent with a particular model, in order to assess that correctness of a model corresponds to correctness of the observed system behavior.

Work on modeling and conformance provides an essential tool to support the *Birds Aren't Real* hypothesis! Modeling of drones is well-studied in the literature; at the same time significant real-world data is available on the observed behavior of avioids in the fields. If the observed behavior of an avioid agrees with a formal model of a drone, the conclusion is obvious: the avioids are drones, not Aves, hence, *Birds are Not Real*.

To this end, we present a model of a drone, then evaluate it against real-world data. The model is written in *differential game logic* (dGL) [11], a well-established logic for modeling and verified hybrid games, a powerful modeling framework for CPSs. We present the drone model:

```
Drone ::=
   {t:=*; x:=*; y:=*; vxLo:=*; vxHi:=*; slopeLo:=*; slopeHi:=*;}
   xpre:=x; ypre:=y; tpre := t;
   {slope:=*; ?(slopeLo <= slope & slope <= slopeHi);
     vx :=*; ?(vxLo <= vx & vx <= vxHi);
     {x'= vx, y'=vx*slope, t' = 1}*
   }*
   !(vxLo*(t-tpre) + xpre <= x & x <= vxHi*(t-tpre) + xpre);
   !(vyLo*(t-tpre) + ypre <= y & y <= vyHi*(t-tpre) + ypre);
```

The initial line of the model says the initial values of the following variables are arbitrary:

- **t** - the system clock, in arbitrary time units
- **x** - the x-coordinate of the drone, in arbitrary distance units
- **y** - the y-coordinate of the drone, in the same distance units
- **vxLo** - the minimum x speed in distance units per time units
- **vxHi** - the maximum x speed in the same units
- **slopeLo** - the minimum flight path slope (difference in y per difference in x)
- **slopeHi** - the maximum flight path slope

after which the second line stores the initial space and time coordinates in auxiliary variables. The next model section is a loop which allows the slope and speed to change within the stated bounds, then repeats an inner loop containing a system of ordinary differential equations (ODEs). The ODEs represent the physical motion of the system, indicating that the *x* coordinate changes by speed *vx* and the *y* coordinate changes proportional to *vx*slope*, while the timer changes at a fixed, arbitrary rate.
The final lines contain assertions, which indicate properties that must hold at the given line; intuitively, these lines are a correctness specification for the system. They say that the final *x* and *y* coordinates must lie within an interval determined by the range of allowed speeds and the duration of system execution, in addition to the initial coordinates.

Having presented the model, we could proceed immediately to comparing it against experimental data, but there is a catch. An ODE model specifies an exact trajectory: for a given time and speed, the position is uniquely determined. History has shown that such models are far

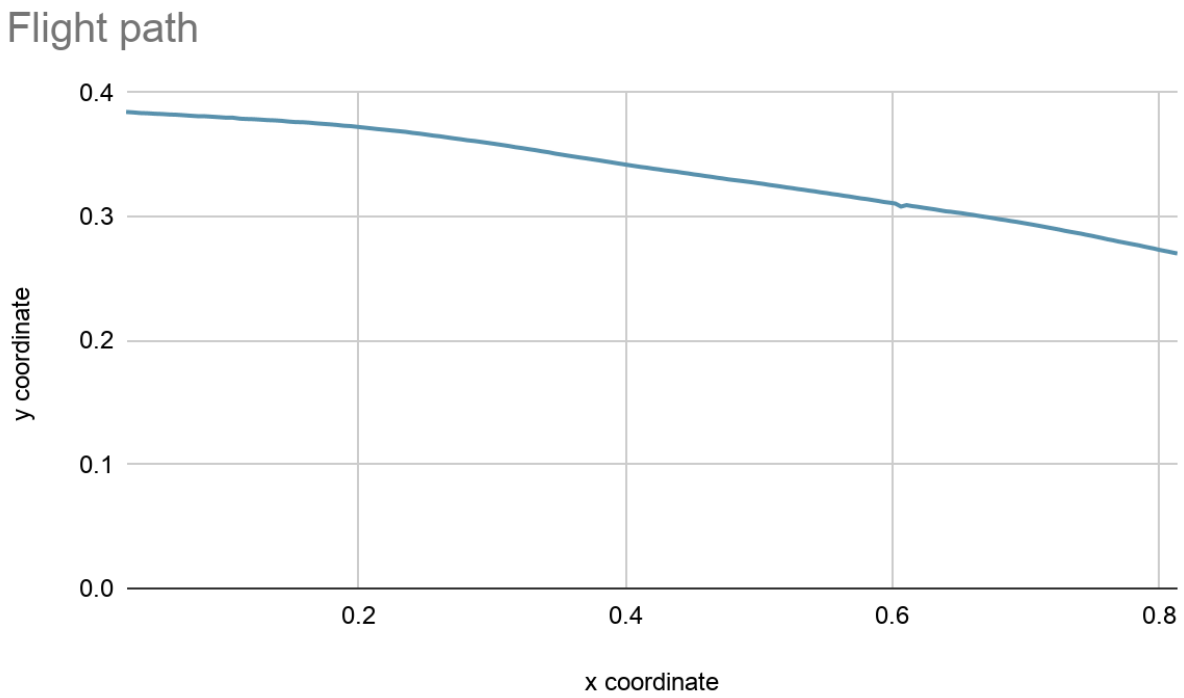
too strict for validation against practical data. For that reason, the latest dL-based techniques for extraction of correct code from models take a more nuanced approach: in proving the correctness of a system, one can develop *invariants* which are flexible enough to describe realistic data, yet strong enough to show correctness, and thus still an appropriate system model in and of themselves. Thus, we will briefly give the correctness invariants for the drone model, then monitor those invariants.

We omit the full proof for the sake of the dear reader's time, but we observe that the differential equation admits invariants which are quite closely related to the overall system correctness property, where <*var*>*mid* indicates its value immediately before the ODE:

- vxLo*(t-tmid) + xmid <= x & x <= vxHi*(t-tmid) + xmid
- vxLo*slopeLo*(t-tmid) + ymid <= y & y <= vxHi*slopeHi*(t-tmid) + ymid

to assess model compliance, we simply monitor the above invariants.

Gathering and extracting experimental data is also an important aspect of the evaluation. For this evaluation, we used a BBC Earth documentary [3] on the flight of owls. Extracting flight paths from video was itself an important step. For this task, we loaded the video in DaVinci Resolve [12], cut it down to the footage of avioids in flight, then applied a *tracker* to record the position of the avioid on each frame (specifically the position of its eye within the frame). The time and position data recorded by the tracker were then extracted as a space-delimited file for further processing. The following figure shows the flight path in Resolve's internal coordinates (the path starts at the right and moves left):



In order to compare the underlying data against the model, appropriate system parameters had to be inferred, which is the case for all models, including drone models, which have parameters. Experiments have shown the following system parameters to be appropriate:

vxLo = -0.003 vxHi = -0.0015 rangeLo = -0.58 rangeHi = 0.28

where the negative values are due to the fact that the path moves from right to left, and the high range in the slope is due to the fact that the data are high-frequency: one data point per frame. When sampled at such high frequency, even low amounts of noise can lead to significant deviations from the norm for individual frames.

Given these realistic parameters for a drone, we were able to compute for each frame of data whether those data complied with the drone model. We did so using a state-of-the-art programming language: *Microsoft Excel* [13]. Recall that the larger the proportion of frames that follow the invariants, the more the avioid is drone-like. Because the avioid is purported to be an Aves, more drone-like results imply that *Birds Are Less Real*. The results of the evaluation shocked us, so we encourage the reader to make sure they are in an appropriate mental state before continuing.

Every single frame satisfied the invariants.

Every.
Single.
Frame.

This is the *strongest possible evidence* in favor of the *Birds Are Not Real* which any dynamical analysis could ever even try to achieve.

Self-Criticism, Limitations, and Call to Action

Moving toward the conclusion of the paper, it is essential to recognize the limitations of the methods applied herein. Among these limitations, it is essential to recognize the positionality of the authors. As we have examined, neoimperialist hegemony is at the heart of the globalization of the *CIA Bird Genocide*. The likely elimination of Aves in Japan cannot be fully separated from the post-World War II reconstruction of Japan and the growing American hegemony which was inherent to that project. As American critics of bird genocide, the authors must be the first among to commit to undoing the hegemonic dynamics that induced the present situation. Given this positionality, it is not the place of the authors, let alone the place of this paper, to prescribe the methods Japanese activists should use to rectify the bird genocide, rather our place is to criticize to imperialism and hegemony in all their forms and aid in their dismantling.

Because we must oppose hegemony in all its forms, however, the discussion would be incomplete without discourse on hegemony internal to Japan. Of the dozens of US military bases in Japan, at least 25 bases [8] are located in the Ryūkyū islands, in Okinawa Prefecture. These bases are notably less popular among the Ryūkyū people than among residents of the 4 largest islands, let alone the political class that negotiates international military treaties.

Because US military hegemony is essential to the genocide, and US military hegemony relies fundamentally on the ability of the political class to override the wishes of the majority of Ryūkyū residents, it is not a stretch to suggest that the bird genocide may have been prevented, certainly opposed more easily, if not for the political disempowerment of Ryūkyū people. It is for that reason that, as we end our paper with a call to action, we call not only for the end to US military hegemony globally, but specifically for the political empowerment and self-determination of the Ryūkyū people. The choice of what path they take with that self-determination is theirs alone.

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