Leveraging insect populations to implement large scale deep learning

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1 Introduction

Some insects are popularly considered to serve no purpose in their existence [3]. (This might tempt some to ponder about the usefulness of their own existence, which we leave as an exercise to the reader). Our paper gives insects their much needed existential purpose to serve humans for the greater good. In this work, we present a method to use insects as computational units to train and evaluate large deep learning models including GPT-4 [2]. Insects regularly show an ability to learn from their peers [4, 1]. However, in the past work, researchers have made insects learn things that are futile at best - such as solving puzzles and dance. Computer science researchers have frequently demonstrated that the there is only one type of learning that is useful - machine learning. In this paper, we show that we can force insects to learn from data and simulate large scale models. In addition to its obvious usefulness to humans, we believe our work is tremendously important to the large insect populations as it gives them a concrete purpose to live. Using insects to train models effectively frees up GPUs to be used for what they are intended to be used for - games.

We first collect a variety of insects including bees, termites, and moths from undergrad dorm rooms. We relied on the low effort spent on dorm maintenance for our insect collection. 15213 insects were collected for our experiments.

In the training phase, the insect populations were shown some collected image and text data. Training was done by appropriately rewarding insects with the things they like once they show sufficient proof that they have learnt the right thing. For example, we rewarded moths with light bulbs to flock to; house flies with human ear models to buzz around; termites with papers that PhD students printed hoping to read some day. The training phase took a week. However, this work is in its initial stages and we believe that it can be reduced further.

Training was followed by the testing phase, in which we showed these insects data that they had never seen and recorded their predictive accuracy. To the authors astonishment, the insects displayed a remarkable ability to generalize and achieved an accuracy of 100%.

In the Section 2, we present the technical ideas behind our paper. Section 3 discusses implementation and evaluation. Similarly, the other sections discuss what the section headings claim they do.

2 Obligatory Technical Section

This paper proposes a new way of unconventional computing, using the insect mind as the logical unit, and a reward/evolution loop as the programming procedure. Organic minds have abilities that mechanical minds have not yet been able to replicate. They are also tremendously energy efficient compared to electronic computers. Evolution has developed systems that simulation on binary computers has not been able to. For these reasons, problems that are hard for Turing machines may not be hard for programmed insects. Further, if we confine ourselves to problems where solving is difficult but checking, easy for a conventional computer, training can be automatic with a computer deciding when to reward the insects. Using Insect Learning based computation, as our evaluation shows, has the potential for tremendous impact on the world. It could save the world from climate change; not only is Insect Learning very energy efficient, but also relies on energy sources such as grass and leaves, that are generally seen as renewable. It can solve problems that were previously intractable, and improve equity and inclusiveness because of how cheap insects are, seeing as people often pay to get rid of them.

3 Evaluation and Implementation

We performed an extensive evaluation that confirmed Insect Learning is incredibly effective, outperforming state of the art machine learning architectures by several orders of magnitude. Unfortunately, the termite test subjects ate our physical data sheets. Furthermore, a moth got stuck in the vacuum tubes of the computer that stored a soft copy of our data, leading to memory corruption. We would have conducted our experiments afresh, but the folks at PETI (People for Ethical Treatment of Insects) observed that these actions of our test subjects may suggest a lack of enthusiasm for the research, and held reservations regarding further experimentation. Fortunately, SIGBOVIK does not have an artifact evaluation. But this research absolutely is reproducible if you try hard enough.

4 Related Work

To the best of our knowledge, this work is completely novel. Our extensive literature review [1] turned up no work that was related whatsoever.

5 Future Work

We have answered all potential questions. No avenues for future research remain.

References

[1] Bees learn to dance and to solve puzzles from their peers. https://arstechnica.com/science/2023/03/bees-learn-to-dance-and-to-solve-puzzles-from-their-peers/. Accessed: 2023-03-27.

[2] Gpt-4. https://openai.com/research/gpt-4. Accessed: 2023-03-27.

[3] Most useless insects or do least for the environment (list). https://howitsee.com/most-useless-insects/. Accessed: 2023-03-27.

[4] BRIDGES, A. D., MABOUDI, H., PROCENKO, O., LOCKWOOD, C., MOHAMMED, Y., KOWALEWSKA, A., GONZÁLEZ, J. E. R., WOODGATE, J. L., AND CHITTKA, L. Bumblebees acquire alternative puzzle-box solutions via social learning. *Plos Biology 21*, 3 (2023), e3002019.

[1] The review consisted of asking our office mate if he had seen anything like this before. He didn't think so. We were cautious not to ask our advisors since they *would* likely know of actual related work.