# An Approach to Genuine Intelligence Using Electrophysiology

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**Abstract**

In this note, the authors address the issue of reducing lab animal suffering by training neural networks to generate accurately mimicked brain-like time series. Given the potential for high accuracy, the authors advocate for a worldwide moratorium on animal sacrifice for some neuroscientific research. This approach can be extended to all laboratory science eventually, including nuclear and particle physics. The authors also touch upon its relation to the quest for true intelligence.

Deep learning using multilayer peceptrons can perform impressively if the data set provided is sizable [1]. This is evidenced by the explosion of highly functional LLMs. In this note we propose to create a deep learning pipeline which takes available neurphysiology data sets from online repositories as well as from published journal papers (components such as figures and tables), and trains generative transformers based on these data points. Thereafter, suppose a neurophysiologist is interested in a certain brain region or specific neuron. They perform 5 minutes of recording on the neuron. This is expensive, so they use the generative interface next and obtain say a 50 minute recording via the transformer's output. In this way data collection times in neurphysiology labs can be reduced and re-allocated to other scientific tasks.

This approach is not limited to neurophysiology alone. Any data-generating laboratory activity can be so replaced. This could have implications for example for nuclear testing, cold fusion plasma research and the like where data generating experiments are expensive and deleterious to animals or the environment. In this way countries can try to eliminate these activities from their respective scientific establishments. This would have environmental benefits, as well as the ecology would be preserved as animals would not have to be harvested for experimentation.

The approach is more versatile than what the above would suggest. For instance, since language is produced by active brains (with millions of firing neurons involved), disciplines such as psycholinguistics which study the neural substrates of language processing (example, identifying the neural networks involved in specific phoneme generation), can be marshaled to use the generated spike trains and produce phonemes. This approach to text generation is more

promising than language models since it is based on fundamental biology not collation of text corpora. These "large brain models" could be a promising approach to artificial general intelligence as well. Many brain faculties such as emotional intelligence, interpersonal chemistry and spatial intelligence are not captured in text corpora at any significant level. Thus a device which combines LBMs (large brain models) with LLMs promises the desired future of true human intelligence substrated in silicon.

# References

[1] Ian Goodfellow Bengio, Yoshua and Aaron Courville. *Deep learning*, volume 1. MIT Press.