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Chapter 1 Reflection

General questions

- What are the most useful things you learned from this chapter or video?
  - The most useful thing learned from this chapter is the way in which deep learning can have a profound monetary impact on the healthcare system globally. Given that misdiagnosis is a leading cause of death, there is cause for concern about the stability of our current health care environment. The methods that deep learning technologies employ are being shown to have great impact on the way in which medical professionals practice medicine. Bringing greater efficiency to the industry is the way we can start to cut costs, increase output, and reduce clutter.
- What are the typos in this chapter?
  - No typos were observed in this chapter.
- What improvements do you want to see in this chapter?
  - There are some grammatical issues that should be addressed. It is apparent that in some cases, better language can be used. The usage of prepositions in the introductory paragraphs are somewhat misguided and deserve a second look.

Questions specific to this health data chapter

- Where does the success of deep learning come from?
  - The success of deep learning comes from the impact it can have on the medical industry. The chapter outlines many problems that deep learning has been shown to improve the error rate on. To begin we can discuss the resources that deep learning uses to succeed, starting with data. The book chapter states that "large amounts of rich data, especially in images and natural language texts, become available for training deep learning models" (Xiao & Sun, 2021).
  - The methods that deep learnings use to gain this success are in the form of algorithms. These algorithms have been developed, studied, and fine-tuned over years of research. These algorithms are being enhanced and improved every day in this industry.
  - The algorithms are demanding processes, but we are lucky enough to have sufficient hardware that we can test and train deep learning models out on. Improvements in the hardware field, specifically in the GPU, are enabling the deep learning algorithms to work with ever larger data packages and in much faster time. These hardware pieces are fast, affordable, and durable.
  - Software has also been improved upon. Large and powerful deep learning frameworks and libraries such as Tensorflow and Pytorch can be used to develop deep learning models for healthcare. These are available to the public and have strong support from the technology industry (Xiao & Sun, 2021).
- What is electronic health records (EHRs)?

- EHRs are rich data records that deep learning models for healthcare train on. These records are widely used and have the important benefit of "capturing all the patient encounters with rich-modality data" (Xiao & Sun, 2021). These records have two types of data, structured, and unstructured. The structured data is in the form of medical codes, lab results, and medication information. The unstructured data on the other hand is all other forms of records that do not follow a format. These include medical imagery such as X-Rays, time series data such as electrocardiogram, and clinical notes written by medical staff (Xiao & Sun, 2021).

References

Xiao, C., Sun, J. (2021). Introduction. In: Introduction to Deep Learning for Healthcare.
Springer, Cham. https://doi-org.proxy2.library.illinois.edu/10.1007/978-3-030-82184-5_1