MACS Assignment #9
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     When reading the abstract and introduction of that author Susan Athey's paper "The Impact of Machine Learning on Economics", the research question is not obviously defined. Rather than ask a research question, it seems that the purpose of her article is to discuss the impact and application of machine learning to the field of economics, both broadly in terms of the general field and overall changes as well as narrowly with regards to specific econometric techniques and assumptions that must be considered. The author never directly states a question that her paper might be attempting to answer. However, I do believe that this paper does answer the following questions: "How have researchers in the field of economics utilized machine learning techniques thus far?", "How can economists adopt machine learning techniques to identify causal inference, in addition to ML's predictory abilities?", "How might the field of economics research benefit from machine learning capabilities?", or "How is machine learning shaping the recent and upcoming research literature for economics?"

     While clarity and simplification of certain concepts in the paper would be beneficial to readers, especially those new to machine learning, the author compellingly answers those questions by providing a general overview of machine learning, the objective of most economic researchers, the emerging literature that combines machine learning with the typical econometric approaches. The author combines relevant examples with the appropriate citations to the emerging literature. However, the paper seems to be essentially a literature review and the author's predictions based on her knowledge of the subject, her previous research, and others' research. Given the research questions I identified above, this method of providing examples and subject matter expertise is appropriate and sufficient to answer said questions. Depending on the

audience the author is targeting, I think some of the machine learning and econometric concepts

could have been better explained to those who are new to both. Additionally, the paper could

have been better structured to identify the importance, issues, and benefits of the techniques and

methods that the author discusses.

The author does a nice job of including relevant citations in her section titled

"Applications of Prediction Methods to Policy Problems in Economics." These citations are used

to reference other research of when machine learning has proven useful in public policy settings,

such as when to offer medical care or who to let out on bail (Page 7). Additionally, the author

includes many appropriate citations in her section titled "A New Literature on Machine Learning

and Causal Inference", specifically for the more in-depth subsections for the identification

strategies that she lists on page 11. Finally, the section titled "Broader Predictions About the

Impact of Machine Learning on Economics" includes necessary and relevant citations for the

current literature that supports the transformation in economic studies using ML and the author's

predictions for the continuing trend.

The last sentence of the last paragraph on page 2 that ends on page 3 and begins with

"For those readers coming from [...]" is a long run-on sentence and should be broken into

multiple sentences. Additionally, the word "overlap" should be "overlapped". The third sentence

in the last complete paragraph on page 5 misspells "because" and "they". The fourth sentence of

the second complete paragraph on page 9 misspells "between". In the third sentence of the third

complete paragraph on page 9, the author uses the phrase "for example" twice in the same

sentence. In the last paragraph on page 10 that ends on page 11, the "r" of the word "reduce" in

the third sentence is italicized when it should not be. In the same paragraph in the fifth sentence, the words "time" and "at" are combined. Even if they were separated, the sentence would not make sense grammatically. In the (extremely long) fourth sentence of the last paragraph on page 16, the words "ask" and "the" are combined. The first sentence on page 22 that starts with "This article has al discussed [...]" needs to remove "al". In that same sentence, the second half should read "I will now discuss each of the remaining predictions in turn." In the last sentence of the paragraph that follows the sentence mentioned prior to this one, "of" needs to be added between "in terms" and "thinking".

I would propose a hybrid extension of the research question using both the machine learning methods and the more traditional econometric method to a topic of particular interest to me - online learning. Specifically, how can we identify the best methods of learning for a variety of very different people? For example, Khan Academy is being used by some schools for homework, quizzes, and tests, and a machine learning algorithm adjusts the content offered based on an individual's answers and progress. While this is not a new concept, can then the algorithm provide any insight as to how certain factors play key roles in how our minds and personalities work? Or, might this be able to better predict and nudge individuals into a career field best suited for their abilities? We might then measure these students' trajectories and compare them to those of students who are a similar and viable control group. We might even compare one education algorithm's outcomes for one classroom with a different education algorithm's outcomes for a similar classroom, possibly telling us which machine learning algorithm is more beneficial to society, something that the algorithm alone wouldn't reveal.