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Evaluating the Effectiveness of Algorithmic Modeling with Sociological Perspectives

Within contemporary discussions on the infusion of technology with social norms, there has been increasing overlap between fields such as sociology with algorithmic use and understanding. Within this paper the use of algorithms within social sciences is examined particularly in context of the Proceedings of the National Academy of Sciences, and their article “Measuring the predictability of life outcomes with a scientific mass collaboration” by Matthew J. Salganika. The goal of this study was to assess how accurately individual life outcomes can be predicted using widely available data and machine learning. The researchers collaborated with over 160 teams to analyze data from the UK Household Longitudinal Study. Each team approached the question to analyze the provided data in a different way, but ultimately none of them were able to accurately predict the true outcome. Subsequently, there is no specific approach for one algorithm, rather comprehensive data on the effectiveness of various algorithms.

The researchers examined a wide range of life outcomes, including education, income, subjective well-being, and personality traits. They employed statistical models to analyze how well these outcomes could be predicted based on factors such as socioeconomic background, cognitive ability in childhood, education level, and other assessments. This study revealed that some life outcomes, specifically educational attainment and income level, showed some predictability based on early-life factors. Parental socioeconomic status and childhood cognitive ability were demonstrated to significantly predict outcomes. However, other life outcomes, primarily well-being and personality traits, were found to be significantly less predictable based on early-life factors. The study also demonstrated many of the limitations of current predictive

models in social science research. While statistical models can provide valuable insights, they are incapable of capturing the full complexity of human experience and life outcomes. Salganika and other authors emphasized the need for more advanced methodologies and expanding interdisciplinary approaches to improve predictive accuracy and better understand the factors influencing life outcomes.

Within this examination, this is one of the first critical evaluations of how predictive modeling can be applied to real world scenarios, specifically sociology. Despite hopeful initial thoughts by researchers, achieving high accuracy predictive modeling is difficult, and many of the researchers were surprised with the limited capacity of the models. The study suggests that despite observational data from digital platforms potentially offering valuable insights, they are not always necessary to improve predictive accuracy when compared to traditional data collection methods. Predicting social phenomena and patterns requires a more comprehensive approach that involves various analytical techniques and data sources.

Considering larger algorithmic concerns, particularly algorithmic bias and its tendency to enhance pre existing bias within data sets, technical solutions can range from examining our evaluation of fairness and bias, and using these definitions to inform our participation and construction of algorithms. Within this, we can also examine the intentional checks and balances placed on algorithms, and the ways we can ensure algorithmic fairness is being properly implemented. A potential solution is a comprehensive application of data filtering to ensure the data algorithms being trained on are equitable and checks and balances to ensure equitable results are benign produced. This research begins to digest how algorithmic bias could potentially be reduced or how algorithms could be employed for greater societal good. Although this algorithm does not in itself violate any ethical or privacy concerns, it addresses many of the misunderstandings and false expectations of algorithms and machine learning.

To address the many limitations of predictive models and improve their applicability for various social fields, there are several potential next steps to be explored. Firstly, incorporating

social values and fair data into predictive models can mitigate potential biases and improve the fairness and accuracy of predictions. For one, algorithms could be designed to prioritize resource distribution and access for people who due to socioeconomic status be more vulnerable to adverse life impacts. Within this, interdisciplinary collaboration particularly with social science, computer science, and ethics backgrounds, can facilitate the development of comprehensive predictive models. In these applications researchers can better understand the societal context where predictive models operate and identify strategies to mitigate biases and improve predictive accuracy. In regards to the transparency and accountability of these algorithms, ensuring these principles in a predictive modeling process will ensure trust and privacy concerns are adequately addressed. Incorporating transparent algorithm methodologies and sharing data, methodologies, and model predictions can help identify and correct biases and errors in predictive models, enhancing their reliability and trustworthiness, especially since they allow third parties to identify adverse impacts.

Ultimately, Salganika's study on measuring the predictability of social processes with algorithms highlights the challenges and potential predictive modeling presents in social science research. Through the promotion of social values, interdisciplinary collaboration, transparency and accountability, researchers can work toward establishing the accuracy and fairness of predictive models and better social processes.

References:

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