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Review of "Classifying social media bots as malicious or benign using semi-supervised machine learning"

In this journal, the writers explain how social media sites such as Twitter or Facebook aren't always accessed by humans. These platforms are riddled with bots, and research demonstrates that the bots can be placed into two categories, malicious or benign. A botmaster controls the malicious bots, and they can perform social engineering to collect information about users. Malicious bots can also influence the real world by spreading misinformation on social networks. Most researchers tend to focus on identifying features that can help distinguish a bad bot from a human, and not on the differences between good and bad bots. The authors of the journal wanted to focus on this aspect because research in the area of distinguishing differences in bots is inadequate.

Malicious and benign bots both operate automatically, but their behavior and intent may differ. For example, benign bots, like news update bots, share breaking news, but malicious bots like spamming bots spread spam. These similarities and differences can cause the two bots to be misclassified. These were the research questions that helped contribute to the study:

1. Can the same features used in previous studies to successfully distinguish between malicious bots and humans be useful in classifying benign and malicious bots?
2. What features found in the metadata of OSNs indicate anomalous behavior between benign and malicious bots?
3. Can semi-supervised machine learning models be used to classify malicious and benign bots, given a limited labeled dataset of such bots?

The researchers classified the different types of bots through features indicative of anomalous behavior. 6 of 12 features were identified to be significant, and these features were then used as inputs into semi-supervised classifiers. Four algorithms were implemented to classify benign and malicious bots. There aren't publicly available datasets of benign and malicious bots, so further study is necessary to design a real-time classification system for bots.

This study is important to cybersecurity and social science because it will help to reduce cyber threats caused by the bad bots, but also improve the user-experience on social networks. Bots can truly have an impact on real world events, since the spread of misinformation can cause issues very quickly. Being able to reduce the risk of malicious bots is going to be increasingly important in the future.

Works Cited

https://academic.oup.com/cybersecurity/article/9/1/tyac015/6972135?searchresult=1