**Project Report for Stage 2**

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**1 Introduction and Motivation.**

It’s no secret that the internet has become one of the most important ways that people use to both perform research and purchase goods and services. One of the key tools that potential buyers use is online reviews. An item with an overwhelming number of positive reviews will be considered a high-quality product and attract lots of buyers, while one with mostly negative reviews will be much less likely to be purchased. Similarly, online reviews are one way for a company to receive user feedback on products. As noted in a recent Forbes Technology Council post, 97% of customers use online reviews as a way to find businesses. [1]

Accordingly, companies pay a lot of attention to online reviews. A very positive review may receive a note of thanks from the seller. A very negative review will often receive an apology and an offer to correct the problem.[[1]](#footnote-1) By providing an additional feedback mechanism, reviews can be used to guide product redesign efforts, or even whether to continue selling that product.[2] Therefore, being able to accurately locate and assess both positive and negative reviews is important for business.

However, it is not uncommon to see reviews where the “star” or numerical rating does not match the actual review feedback. A 1-star (poor) rating may have glowing positive feedback, and vice versa. [3] These mis-marked feedback comments make the task of discovering and properly evaluating user feedback more difficult, possibly resulting in faulty business decisions.

Similarly, there is a large problem with fake reviews – either reviews generated *en masse* by bots, reviews for other products (e.g., you are looking at a hammer, but the review is for a Bluetooth headset), or companies willing to outright pay for fake positive reviews designed to boost sales or negative reviews to sabotage competitors. As reported by CBS News, a study by the website Fakespot.com noted that 30% of Amazon reviews are either fake or unreliable.[4]

**2 Problem Definition**

With many thousands, or even millions of online reviews on sites like Amazon.com, discovering mis-marked or fake reviews via manual review would be untenable for most businesses with significant numbers of products for sale. The problem at hand is essentially an anomaly detection task: Which reviews are unreliable or fake? Put another way, the challenge is to accurately classify online review text to discover mis-matched, fake, or otherwise anomalous reviews.

**REFERENCES**

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[3] Nishit Shrestha & Fatma Nasoz. 2019. “Deep Learning Sentiment Analysis of Amazon.com Reviews and Ratings.” International Journal of Soft Computing, Artificial Intelligence and Applications 8, 1 (Feb 2019), 1-15. <http://aircconline.com/ijscai/V8N1/8119ijscai01.pdf>

[4] Aimee Picchi. 2019. “Buyer Beware: Scourge of fake reviews hitting Amazon, Walmart and other major retailers.” CBS.com. <https://www.cbsnews.com/news/buyer-beware-a-scourge-of-fake-online-reviews-is-hitting-amazon-walmart-and-other-major-retailers/>

1. One of the authors bought two separate items online recently. Both arrived inoperative. After posting negative reviews, the author was offered both a refund and a replacement item. [↑](#footnote-ref-1)