

**Analyzing Fashion Trends Across Popular Culture Media Sources and the Subsequent
Trend Classification of Secondhand Clothing Articles**
(Technical Paper)

**The Overconsumption of Fast Fashion:
An Analysis on the Social and Environmental Impacts of Stakeholders**
(STS Paper)

A Thesis Prospectus
In STS 4500
Presented to
The Faculty of the
School of Engineering and Applied Science
University of Virginia
In Partial Fulfillment of the Requirements for the Degree
Bachelor of Science in Computer Science

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November 4, 2022

On my honor as a University student, I have neither given nor received unauthorized aid on this assignment as defined by the Honor Guidelines for Thesis-Related Assignments.

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Introduction

What is the life cycle of a pair of blue jeans? Unless those blue jeans were made before the 1980s or come from a select few environmentally and socially conscious retailers, they were produced in a low to medium income country. They were then shipped en masse across oceans, loaded on trucks, and finally stocked upon a shelf. Assuming those jeans were eventually purchased, they may have lived a good life, getting several years of wear put into them before they were discarded or donated. Discarded textiles account for five percent of landfill space, yet the donation might be worse; due to a lack of consumer interest in secondhand clothing, unsold articles are compressed in 1000 pound bales and shipped back overseas to another lower income country (Bick et al., 2018). To no one's surprise, those blue jeans, compressed along with hundreds of other pairs, often end up as waste, wreaking havoc upon the environment immediately surrounding the lower income country. Such is the global injustice of fast fashion.

But what constitutes fast fashion? Purely from the business sense, fast fashion is a way to “reduce the processes involved in the buying cycle and lead times for getting new fashion product[s] into stores,” so that retailers can keep pace with ever-changing trends (Barnes & Lea-Greenwood, 2006, p. 259). Yet, it is plain to see that the impact of fast fashion stretches much further. In my Science, Technology, and Society (STS) research, I plan to explore trends in consumer behaviors regarding fast fashion to better understand the impact on producer-consumer dynamics and the environment. In collaboration with that research, I hope to identify fashion trends from popular culture (pop culture) media and assist consumers in purchasing secondhand clothing online via several machine learning models. The combination of these research will hopefully provide a deeper understanding of the global injustice of fast fashion levies on different stakeholders and provide a tool to increase domestic secondhand fashion consumption.

Technical

In the technical portion of this research I hope to explore how the combination of multiple machine learning models may identify fashion trends from popular culture (pop culture) media and assist consumers in purchasing secondhand clothing online. For context, IBM identifies machine learning as a subfield of computer science, unique in its use of data and specialized algorithms to “imitate human learning,” (IBM Cloud Education, 2020). Nevertheless, before delving into the machine learning approach, it is worthwhile addressing how such an approach could address the problem. The fast fashion industry excels at capitalizing on clothing trends by marketing highly available clothing articles to customers; availability in this context refers to the difficulty a consumer might face in acquiring said article, often due to a “lack of supply” or “limited options,” (Connel, 2010). The discrepancies between the availability of fast fashion and the availability of secondhand clothing articles will be further explored in the STS Topic section, but a core difference to highlight here is that the online secondhand fashion marketplace suffers from excessive uniqueness. The sheer amount of distinct articles of clothes on secondhand clothing websites force consumers to really work to find an appealing article. The availability of secondhand clothing is thus limited by accessibility, and this accessibility issue is exactly what the machine learning approaches of this research look to address.

In order to make the access of secondhand clothing more efficient and appealing, this research looks to identify pop culture fashion trends and subsequently classify secondhand clothing articles into these trends. As such, the research will be divided into two phases; the first phase involves the identification of fashion trends, such as vintage clothing, through pop culture media sources such as Youtube or Tiktok. To do that, this phase will be further divided into two main challenges: detecting if a specific article of clothing appears in the raw input material and

then clustering identified articles into trends. The first challenge falls within the field of object detection, which is “a technology of deep learning, where things, human, building, cars can be detected as objects in image and videos,” (Patel, 2020). A deep learning model will be trained to detect specific articles of clothing, such as pants or a long-sleeve shirt. For context, deep learning is a subfield of machine learning, predicated on the use of neural networks to simulate the learning patterns exhibited in the human brain, (IBM Cloud Education, 2020). The subsequent challenge of clustering articles in different trends will be met with a separate unsupervised learning model. Unsupervised learning is another field of machine learning, characterized by its ability to train data without an output to reference (Géron, 2019). The successful clustering of identified clothing articles into fashion trends will allow a shift to the second phase of the research.

The second phase of the technical research looks to extrapolate upon the discoveries from the first phase, utilizing the discovered fashion trends to classify articles of clothing from secondhand retail websites such as Grailed and Depop. After labeling the trends discovered in the first phase, those clothing articles will then be used as a training data for a supervised learning model. Supervised learning utilizes labeled data to make predictions on unlabeled data (Géron, 2019). In supplying the supervised learning model with articles of clothing from these secondhand retailers, the model will predict with fashion they best align with. The implementation of these machine learning models looks to provide insight into how a combination of machine learning models may succeed in classifying emerging fashion trends.

STS Topic

According to Samuel Mcleod, clothing is a basic, physiological human necessity, falling in the base layer of Maslow's hierarchy of needs (Mcleod, 2020). Yet, in quickly discarding these supposed necessities as part of the fast fashion cycle, the ethics of fashion consumption quickly become a topic for discussion. In order to better understand the social implications that surround ethical and sustainable fashion consumption, it is important to first grasp how trends in consumer behavior impact fashion consumption.

According to Berberyan and colleagues, the main factors that influence consumer behavior can be broken down into two overarching categories: product-related factors and consumer-related factors. Product-related factors entail the price, quality, information, style, and availability of the piece (Berberyan et al., 2018, pp. 39-40). The goal of product-driven fashion is simple: produce quality pieces at a low-cost. This, in turn, kept fashion simple in times of product-driven business strategies. For example, in the 1980s, when product-driven strategies dominated the industry, an emphasis was placed on forecasting trends and limiting change due to factory constraints, resulting in the classic fashion trend of a white T-shirt and Levi's blue jeans (Gupta & Gentry, 2018, p. 15). However, as outsourcing manufacturing became a cost-effective means of production, this opened the door for consumer-driven fashion. Retailers could now market off the latest fashion trends, allowing them to "frequently updat[e] products with short renewal cycles and turn the inventory at a rapid rate," (Gupta & Gentry, 2018, p. 16). This shift in consumer behavior began the rise of fast fashion.

In order to better analyze the socio-technical system that encompasses the fast fashion industry, the key stakeholders or actors must be identified, and their motives understood. Therefore, in conducting this research, the Actor Network Theory (ANT) Framework will be

utilized to better understand the socio-technical dynamics at play. Cressman discusses in his “Brief Overview of Actor-Network Theory” that this framework is an abstract process by which the “associations between heterogeneous actors” are studied (Cressman, 2009, p. 4). These heterogeneous actors include if not are strictly composed of the stakeholders and physical or non-physical artifacts within the socio-technical system. While the fashion consumers, low income producing population, and fashion industry corporations exist as obvious actors within the network, I will further explore associations with lesser recognized actors, such as the shipping industry, waste management policies, and impacted ecosystems. With a goal of understanding the dynamics involved in the producer-consumer relationship, a framework oriented about studying the associations between actors within the network is ideal.

Nevertheless, this framework certainly has incurred a great deal of scrutiny, with one prevailing criticism supposing that ANT fails to “provide a critical account of the organization;” however, this point is made after conceding that ANT does provide utility in the “empirical analysis of the organization process,” (Whittle & Spicer, 2008, p. 611). This critique comes seeded with the assumption that there will exist some causal relationships within the network such that a critical account is formable. To this point, Cressman argues that “for ANT there are no causes, only effects,” (Cressman, 2009, p. 5). As such, the concession that ANT provides utility in its analysis of the organizational process supports the decision to utilize it as the framework by which I will analyze the associations between actors within the network of fast fashion consumption.

Research Question and Methods

To reiterate, this research looks to analyze how trends in consumer behaviors surrounding the consumption of fast fashion impact the producer-consumer dynamic and the global environment. To do so, the Actor Network Theory Framework (ANT) will be used to better understand the associations between these stakeholders and technological artifacts. In conducting the research under the ANT framework, both a network analysis and documentary research will be utilized. The network analysis aligns well with the ANT framework, supporting the initiative to better understand the associations between actors.

While the decision to involve documentary research is slightly less intrinsic to the chosen framework than the network analysis, its potential in combination with effective keywords and phrases is marked. In collecting this research, I plan to use keywords and phrases such as fast fashion, sustainable fashion consumption, textile waste, and secondhand clothing exports. While these phrases may get revised upon further collection of relevant research, they provide a strong baseline for understanding social and environmental impact that unsustainable fashion consumption will have on all stakeholders involved. I hope to gather data regarding each stakeholder's connection to and awareness of the consequential impacts the fast fashion industry creates, as that information will best serve my ability to understand the dynamics at play between the actors within the network.

Conclusion

The culmination of this research project looks to provide two deliverables. The technical deliverable will consist of several machine learning models, working in conjunction with one another to identify fashion trends from pop culture and assist consumers in purchasing secondhand clothing online. Once implemented, secondhand clothing retailers or intermediaries

could implement the models to make recommendations to users based on trending fashion. Depending on computational power and data privacy policies, the models could further be personalized to each user such that the identified trends come directly from their pop culture media consumption. The STS deliverable will consist of a report analyzing consumer behaviors and the subsequent impact on producer-consumer dynamics and the environment. It looks to provide stakeholders with an understanding of the impact they have, potentially then influence their decisions from there on out. Together, these deliverables may be part of a larger effort to sway the public away from the fast fashion industry and onto more sustainable fashion consumption.

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