

**Thesis Project Portfolio**

**Fall Risk Classification Among Seniors**

(Technical Report)

**E-Waste Management: An Analysis of The Transition of E-Waste Management in China**

(STS Research Paper)

An Undergraduate Thesis

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## **Table of Contents**

Sociotechnical Synthesis

Fall Risk Classification Among Seniors

E-Waste Management: An Analysis of The Transition of E-Waste Management in China

Prospectus

## **Sociotechnical Synthesis**

E-waste has become a global phenomenon due to the quickly expanding market of electronic devices in recent years. E-waste management is a hurdle for every country because it contains hazardous elements and might lead to intoxicity of workers when processing it, and waste management infrastructure most countries currently have do not demonstrate the capacity to process this huge amount of e-waste. For past years China has been the largest importer of recyclable waste in the world. But as China and other developing countries that used to import waste are now reducing or refusing imports, countries that used to export most of their e-waste are in dire need to explore new, efficient ways to manage e-waste. The STS research explores the problematic consequences of e-waste when it arrived at and stayed in the destination countries, and discusses the injustice of a global network of waste imports and exports and how the countries at disadvantaged positions are breaking the balance of the global network and fighting back.

Falls in elderly people are the leading cause of visits to emergency departments and can lead to serious health problems. It is reported that nearly 28-35% of people aged 65 years and above fall each year (Fuller, 2000). Annually, 1800 falls directly result in death while 9500 deaths in the elderly Americans are associated with falling (Sharif et al., 2018). Advancement in data collection allows simple procedures for both clinicians and patients to collect valuable information on gait features during walking. Artificial neural networks (ANN) have gained popularity due to their unique power in creating complex prediction functions. This project takes the advantages of the ability of collecting gait information and the classification power supported by ANNs, and aims to develop two kinds of neural network models to classify fallers among

seniors using the collected stabilogram data. Given the strong prediction potential of ANNs, physicians can use such models to reliably identify fallers in the patients by taking several straightforward measurements and to assign appropriate assistance to them.

By investigating the reform of e-waste management in China, this STS research paper recommends e-waste management strategies including determined political support and engagement of the public through the platforms of social media. This research also recognizes that currently an ideal solution to the disappearance of e-waste is intangible, but it is a direction that is worth our attention.

The technical work from the capstone team will present two developed ANN models and assess their abilities to classify fallers among seniors. Utilizing ANN models in clinics can improve the efficiency and accuracy of a medical professional diagnosing seniors with fall risk.

References:

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