

**Thesis Project Portfolio**

**Automated Diagnosis of Melanoma**

(Technical Report)

**Attitudes Towards the Valuation of Data Privacy on Social Media**

(STS Research Paper)

An Undergraduate Thesis

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## **Sociotechnical Synthesis**

Technological designs are cyclical in that when they are used to solve a problem, new issues consequently arise, that of which are best solved by new designs. A prime example, and the topic of this thesis, is the emergence and proliferation of social media. The internet age and its prominent companies like Facebook, Twitter, and Google have revolutionized the way information is transferred around the world. While the fields of communication and knowledge have benefitted, privacy rights have not. The STS research portion of this thesis attempts to examine the marketization of personal data and the social attitudes that have allowed the phenomenon to reach such a point. An important distinction of the STS framework used is that it views people as changing, not getting changed by, technology. There are a certain blend of stakeholder goals that have resulted in social media platforms gaining so much access to users' data. The technical project of this thesis originally intended to continue upon the cyclical concept of problem-solving by providing the foundation for an application that allows social media users to visualize their online presence to advertisers. Given criteria of each user's interactions, such as likes, comments, search terms, or hashtags, it leverages the power of machine learning to extrapolate the industries most likely to be sending targeted advertisements. Ideally, the user would made aware of their online habits and have the opportunity to take better control of their personal information.

The technical topic proposed in the thesis prospectus aimed to provide the average social media user with a program that provides them an analysis of their otherwise implicit marketability on social media platforms. However following the formation of project groups, coupled with differing topic ideas and approaching deadlines, the subject of the technical project shifted to detection of skin cancer based on given images. Except for the issue to be addressed,

the project goals otherwise remained the same. The technical report still proposes a consumer application that utilizes deep learning architecture to classify inputs. Instead of labeling user accounts as receptive to food or sports, for example, it labels pictures of skin lesions as potentially benign or malignant. The neural network is to be trained on preexisting datasets of skin lesions, and further updated as users upload their own images. Cloud computing platforms, namely Amazon Web Services, provides both the computing hardware to train the deep convolutional networks and the database storage to securely store user data that serves the web application. While similar tools already exist, they are restricted to professional use and lack any frontend. The proposed technical project aims to perform with at least 90% testing accuracy, nearing what these previous implementations can achieve. More importantly, it provides an intuitive user interface and low-to-absent usage cost, which is in line with the overarching mission give individuals the power of insight into themselves.

The STS research portion of the thesis utilizes the Social Construction of Technology framework to evaluate how societal attitudes have enabled the rise of consumer data increasingly being used to generate profit from advertisements, and the balance of convenience and personal rights is managed. The framework's stakeholder tenet helped produce the insight that education and generational trends were major factors in valuing personal privacy. Younger generations tend to be more trusting of governments and corporations, perhaps due to familiarity to the relevant technologies earlier on. Additionally, surveys demonstrate a lack of education regarding internet safety, and a lack of awareness about how one's information could be used without their knowing. Social media companies are able to capitalize on these vulnerabilities and manipulate data for their benefit, in the form of targeted advertising and political or business gains. By

exposing these aspects of society that directly feed the problem, it is easier to formulate plans that create a more ideal compromise between privacy rights and engaging media.

This thesis hopes to encourage individuals to be more cognizant of their personal rights in this day and age. While technology brings great potential to connect minds and ideas, it also threatens to diminish the control that people deserve to have over themselves. In order to find an ideal middle ground between innovation and liberty, stakeholders must weigh their goals against their principles.