Group Name: Shadow Agents

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Title: An Exhaustive Study of Threats and Vulnerabilities in Geo-Tagging

Problem:

Humans are clicking pictures on a daily basis and some of them every hour or even every minute. Users upload these photos on various social media platforms using their smart phones, laptops and other devices. These pictures contain a variety of information with them such as format of image, size, resolution and most importantly geo-tags. These geo-tags are used by major social media platforms and several cloud storage apps for providing a better user experience and feature enhancements. But these geo-tags are also being used by attackers to carry out unethical activities. Attackers can use the geo-tags to know the location of the card parked by user and steal it; locations of animals clicked during a visit of a wildlife sanctuary and harm those animals. These examples do not contribute to even 10% of attacks that are possible using geo-tags.

Through this paper we want to present an exhaustive study into geo-tagging of images. Our major focus is to expose the threats and vulnerabilities of geo-tagging. We will be studying the various attacks carried out using pictures embedded with “EXIF” data. We will present the scale at which these tags can be mined and various mechanisms that can be to extract the geo-tags. We will also present a system which can detect the presence of geo-tag data and make user aware about it while uploading a photo.

Authors in the paper “GeoIntelligence: Data Mining Locational Social Media Content for Profiling and Information Gathering” have introduced a mechanism to gather the data from publicly available geo-tagged photos from social media platforms. We will be examining the attacks and potential misuse of the data gathered through such mechanisms.

Context coming from Japjeet: (Reference for Ajit)

He has added the number of attacks carried out using geo-tags. But need to add few points such as the methods used for extracting the data and any previous research work which presents the analysis of threats and vulnerabilities involved with geo tagging. Requesting Ajit to add those if available.

Methodology or Approach:

A lot of research work has been done on extraction of geo-tag data from tweets, unstructured data and various other means. A very little work is available on the attacks carried out using geo-tag information. In this paper, we will perform the geo-tag extraction from “EXIF” data. We will extract the data from social media platforms and also discuss other potential ways to extract the geo-tag data from pictures to expose the vulnerabilities that can be exploited by attackers. We also present methods with which users can prevent the misuse of the data from their pictures. We will also identify various methods using which location details are embedded into pictures without consent of user.

Evaluation:

We will perform our experiments on images with various formats clicked from smart phones. We will analyse the data generated from our experiments and present the scale at which the attackers can gather those data. We will profile the data and present the possible misuse of geo-tags.

Scope:

We plan to complete our background study about the related works and submit the report by the deadline of literature review.

We will run our experiments and organise the results by the end of October.

By the end of semester, we will have a comprehensive study on the threats and vulnerabilities involved with geo-tags in “EXIF” backed by data generated through our experiments and potential misuse of geo-tag data by attackers. We will also create a plugin which can alert the user about the data stored in pictures before sharing the pictures on social media platforms