**INTRODUCTION**

DATA breaches are one of the most devastating cyber incidents. The Privacy Rights Clearinghouse [1] reports 7,730 data breaches between 2005 and 2017, accounting for 9,919,228,821 breached records. The Identity Theft Resource Center and Cyber Scout [2] reports 1,093 data breach incidents in 2016, which is 40% higher than the 780 data breach incidents in 2015. The United States Office of Personnel Management (OPM) [3] reports that the personnel information of 4.2 million current and former Federal government employees and the background investigation records of current, former, and prospective federal employees and contractors (including 21.5 million Social Security Numbers) were stolen in 2015. The monetary price incurred by data breaches is also substantial. IBM [4] reports that in year 2016, the global average cost for each lost or stolen record containing sensitive or confidential information . While technological solutions can harden cyber systems against attacks, data breaches continue to be a big problem. This motivates us to characterize the evolution of data breach incidents. This not only will deep our understanding of data breaches, but also shed light on other approaches for mitigating the damage, such as insurance. Many believe that insurance will be useful, but the development of accurate cyber risk metrics to guide the assignment of insurance rates is beyond the reach of the current understanding of data breaches (e.g., the lack of modeling approaches) [6]. Recently, researchers started modeling data breach incidents. Maillart and Sornette [7] studied the statistical properties of the personal identity losses in the United States between year 2000 and 2008 [8]. They found that the number of breach incidents dramatically increases from 2000 to July 2006 but remains stable thereafter. Edwards et al. [9] analyzed a dataset containing 2,253 breach incidents that span over a decade (2005 to 2015) [1]. They found that neither the size nor the frequency of data breaches has increased over the years. Wheatley et al. [10] analyzed a dataset that is combined from [8] and [1] and corresponds to organizational breach incidents between year 2000 and 2015. They found that the frequency of large breach incidents (i.e., the ones that breach more than 50,000 records) occurring to US firms is independent of time, but the frequency of large breach incidents occurring to non-US firms exhibits an increasing trend.