Chapter 11
Developing and Validating Fuzzy-Based Trust Measures for Online Medical Diagnosis and Symptoms Analysis

Shruti Kohli
Birla Institute of Technology, India

ABSTRACT
The wealth of medical information in the Web makes it expedient for non-experts to conduct their own diagnosis and healthcare assessment based on limited knowledge of signs, symptoms, and disorders. The goal of this chapter is to explain how to measure trust of websites that provide functionalities like Online Medical Diagnosis and exploration of Symptoms Analysis using fuzzy logic and soft computing techniques. Trust is qualitative and can be measured by analyzing how people interact with the websites. The interaction can be captured and analyzed by studying website logs using tools like Google analytics, click tail, etc. The chapter also provides a literature survey on the work being conducted by researchers in area of measuring website trust and tools being developed for same. It also covers archetypal techniques used for Web pattern recognition and taxonomy of trust. The main point driven by this literature survey is the frequent use of fuzzy logic in the design and implementation of trust measuring tools. This point is contrasted with the up-to-the-minute information, more specifically the authors’ current work, on the use of a rule-based expert for developing trust-measuring tools.

INTRODUCTION
To succeed in the avenue of e-commerce, there are lots of factors to consider; one of the most important and vital one is trust. For any medical website it is a life line. In today’s era, people are so busy, that they hardly have ample time to visit a doctor. Online diagnosis is becoming popular day by day. They can use this service of online diagnosis system from their home or office space and have an idea about the disease; and then can refer the specialist doctor if needed.

Health information is one of the most widely searched topics on the Web. A recent survey by

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the Pew Internet and American Life Project found that 59% of U.S. adults have looked online for health information in the past year, with 35% of respondents seeking to diagnose a medical condition online (Fox and Duggan-2013). Health information search is steered using both search systems such as Internet search engines and via social media (e.g., advice from friends and others). Nevertheless, studies have found that cyberspace can be a costly place for those with no medical training. For example, the common task of performing self-diagnosis can lead to unwarranted anxiety driven by biases of indexing and retrieval in search engines and biases of user judgment (White and Horvitz-2009). Such challenges frame current and future research on enhancing information retrieval (IR) methods at both the infrastructure and user-facing levels. It includes translating both consumer queries and technical terminology, personalizing retrieved content by considering searchers’ domain knowledge, and identifying reliable information during ranking and crawling (Tang et al-2005). This domain also presents unprecedented opportunities to develop applications capable of monitoring and improving the quality of life of people affected by a variety of medical conditions via tools to support their health-oriented information behavior. Mining aspects of that behavior (e.g., queries and social media interactions) with consent in the aggregate across many users can assist in medical discoveries (White et al-2013) and enhance public health monitoring (Brownstein et al-2009, Butler-2013, Paul et al-2011). The monitoring and use of health-related online behavior also acme important tradeoffs between user/patient confidentiality and benefit to those people and wider society, which we believe needs to be reconnoitered and understood in greater detail.

Most of these websites are visited by health cognizant people who are acute about health care articles. Many visitors are patients who are looking for appropriate online information about diagnosis and cure of different diseases. The portals like http://www.webmd.com, http://www.patient.co.uk, http://www.health.ny.gov/diseases/, http://www.health.ny.gov/diseases/ offer good health care and medicinal information. Any endeavor of developing a web-based system dealing with disease diagnosis has to overcome various difficulties. Some websites having bio medical e-literatures like www.pubmed.nl, medicine.net and e-health are free for the public. Readers use search portal for getting health related information such as causes of Sleep Walking, Heart Attack Aspirin prevention etc. A special feature of Pub Med is its “Clinical Queries” section, where “Clinical Categories”, “Systematic Reviews”, and “Medical Genetics” subjects can be searched, with study-type ‘filters’ automatically applied to identify substantial, robust studies. As these ‘clinical queries’ can spawn small sets of vigorous studies with considerable precision, it has been suggested that this Pub Med section can be used as a ‘point-of-care’ resource.

Web search may be incongruous if used as a diagnostic procedure, where queries describing symptoms are input and rank and information of results are interpreted as diagnostic conclusions. In earlier work (White and Horvitz -2009), the term cyberchondria (coined by the popular press) to refer to the unfounded escalation of concerns about common symptoms based on the review of search results and literature online.

BACKGROUND

According to Webster’s Dictionary, trust is defined as “assured reliance on the character, ability, strength, or truth of someone or something”. Trust is the foundation of all prosperous relationships. So, how do we build trust in the Internet age? Manifestations of trust are easy to distinguish because we experience and rely on it every day, but at the same time trust is quite challenging to define because it manifests itself in many different forms and refers to a range of different problems