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Towards Better Understanding Cybersecurity: Or Are "Cyberspace" and "Cyber Space" the Same?

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Towards better understanding Cybersecurity: or are "Cyberspace" and "Cyber Space" the same?

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POSTER ABSTRACT

Although there are many technology challenges and approaches to attaining cybersecurity, human actions (or inactions) also often pose large risks. There are many reasons, but one problem is whether we all "see the world" the same way. That is, what does "cybersecurity" actually mean – as well as the many related concepts, such as "cyberthreat," "cybercrime," etc. Although dictionaries, glossaries, and other sources tell you what words/phrases are supposed to mean (somewhat complicated by the fact that they often contradict each other), they do not tell you how people are actually using them. If we are to have an effective solution, it is important that all the parties understand each other – or, at least, understand that there are different perspectives.

For the purpose of this poster and to demonstrate our methodology, we consider the case of the words, "cyberspace" and "cyber space." We had developed techniques and algorithms for

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the automated generation of taxonomies for chosen "seed terms" (such as "cyberspace" and "cyber space") based on the co-occurrence of those words in the list of keywords of documents in large document repositories, such as Compendex and Inspec. The system that we had developed and used in this experiment employed the Heymann algorithm, closeness centrality, cosine similarity metric (which we refer to as H-CC). When we started, we assumed that "cyberspace" and "cyber space" were essentially the same word with just a minor variation in punctuation (i.e., the space, or lack thereof, between "cyber" and "space") and that the choice of the punctuation was a rather random occurrence. With that assumption in mind, we would expect that the usage of these words would be basically the same and would produce roughly similar taxonomies. As it turned out, the taxonomies generated were quite different, both in overall shape and groupings within the taxonomy.

Since the overall field of cybersecurity is so new, understanding the field and how people think about it (as evidenced by their actual usage of terminology, and how usage changes over time) is an important goal. Our approach helps to illuminate these understandings.

Keywords: Cybersecurity, Understanding Cybersecurity, Cyberspace, Cyber Space, Terminology, Taxonomies, Taxonomy Generation