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Research Article

An Efficient Ranking Model for Multiuser Social Media applications using Customized Page Rank Method

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Abstract

It has been found that the web is being used as a tool by radical or extremist groups and users to carry out a variety of acts with hidden agendas and promote their ideas in every part of the world. Some web forums are mainly used for open discussion on serious issues influenced by radical ideas. Influential users dominate and influence newly connected innocent users through their radical ideas. This paper introduces a principle for identifying radically influential users in web forums. Posts commented with a list of threats are captured by the user by a criterion based on the degree of match. This web forum basically identifies influential users. Eleven different collocation metrics are formulated to identify the association between users, and they are finally embedded in a customized page rank algorithm to create a numbered list of basic influential users. Connection theory is more effective in dealing with such ranking problem than measures based on tactical and temporal equality.

Keywords: Ranking Model, Social Media, Multiuser, Customized Page Rank Model, User input

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1. Introduction

The most basic description of things, events, activities and transactions is data. Organized data that has meaning and value is called information. Data mining is the extraction of implicit, previously unknown and potentially useful information from information. Research and analysis

of large amounts of data through automated and semi-automated means to find meaningful patterns. Data mining is also the act of finding interesting patterns from large amounts of data. The web is being used as a tool to carry out many kinds of mischievous acts with a hidden agenda and to promote ideologies in a practical way [1]. The infiltration of extremist groups, hate groups, ethnic supremacy groups and terrorist organizations on the web with hundreds of multimedia websites, chat online chat rooms and web forums is posing a serious threat to our societies as well as national security. Public debates between extremist groups, often with different ideologies, lead to irreversible negotiations with abusive language and promote online hate and violence. Hence the identity of the dominant user and ranking them from the group [2].

Part of the web that revolves around the sinister intentions of radical groups is called the Dark Web, and web forums with a significant proliferation of activities that support extremism in particular are called the Dark Web Forum. The second category, called the Gray Web Forum, refers to discussions in which discussions focus on topics that promote potentially biased, abusive, or disruptive behaviors and may disrupt society or threaten public safety. It includes topics like pirated CDs, gambling, spirituality, bullying and line. Due to the enormous and rapid growth of user-generated content on social media sites, a significant portion of such data remains voice only, and users generally avoid going to every comment posted by others. There have always been some users who develop some trusting relationship with other members through their politeness and the quality of the comment, and their comment always gets the attention of a large community. These are influential users, also often called community leaders, who play a leading and dominant role in the community, and their activities and comments greatly influence the feelings of others [3].

Radicalism is defined as the galvanization of people by fanatical ideas beyond religious ideas ranging from political, religious, ethnic, nationalist or any other ideology. People undergoing this galvanization usually have no personal values for morality and rationalism, and are characterized by the word radical. These types of thoughts are aroused in the mind when they feel that there has been some injustice or discrimination with them directly or indirectly, although it may be really wrong. These ideas are stimulated by their personal involvement (e.g., death of a close relative or friend), political affiliation (e.g., adherence to a political or religious belief), and social involvement (e.g. racism, nationalism). Is performed. Thus, their enmity may be against any race, or political party, or religion, or nation, or any organization with a group of followers. These are the most committed followers of a cause that commits such innocent acts of terrorism. These radical users try to impose their ideas on other members and group with them and endanger society. Various radical ideas are related to aggression and destroy globally. Destruction affects the lives of innocent people [4].

Attempts are made to give users a ranking based on their posts in the web forums to identify their radicalism. Identifying such users is a great necessity as they pose a major threat to society and remain a challenge to national security. User posts are compared to a list of threats kept in the database and are considered if a match is found. The user with radical and more radical posts is considered more impressive and ranks at the top. Two types of algorithms are used for identification, page rank algorithm and average reciprocal algorithm. This implementation is done on a standalone application that is only accessed by web forum staff [5].

II. Literature Survey

Llodl et al, emphasizes that cybercrime activities are supported by infrastructure and services arising from the underground economy. The current understanding of this phenomenon is that information in a cybercrime economy should be fraught with asymmetry and adverse selection problems. They should make the effects that are seen every day impossible to sustain. The market structure and design used by cyber criminals is shown and evolved towards market design that is similar to legitimate, rich, line non-line forum markets such as eBay. Comparisons show that cybercrime markets have evolved exponentially, with 'scams for scammers' maturing, regulatory mechanisms that greatly support the efficiency of trade. The basis is to see that the dominant users dominate the new joiners. Market regulatory mechanisms of the past two forum markets: the failed market of credit cards and other illicit goods and another active market for vulnerabilities, exploitation and cyber attacks [6].

Jialun Qin, ATL et al, argues that extremist organizations make extensive use of Internet technology to increase their ability to influence the world. Automated web crawling techniques are used to create extensive international web collections. A systematic content analysis tool, the Dark Web Attribute System, is then used to analyze and compare views of extremist organizations and their web interactions. Current research shows that extremists primarily use the Internet to increase their information operations around propaganda, communications, and psychological rents. Studies have been conducted on how extremist organizations use the web to facilitate their activities. Due to manual analysis, the approach was less efficient and limited [7].

Jingstian Jian, et al, develops Focus under the supervision of what is known as a forum crawler is a supervised web scale forum crawler. Focus aims to crawl platform content from the web with minimal overhead. Forum threads contain information content that is the target of forum crawlers. But all of these forums have similar implicit navigation paths connected by specific URL types to lead users from login pages to thread pages. So web forum crawling can be reduced to a URL type validation problem [8]. The forum entry URL points to its home page. Login URL search was a problem. Normal crawlers adopt a one-width first traversal strategy that is generally unsuitable for web crawlers. Gingiania's big contribution is to reduce the problem of forum crawling to the URL type recognition problem and to implement FOCUS, automatically learning regular expression patterns that recognize index URLs, thread URLs and page flipping URLs. An entry URL must be specified to begin the crawling process. The focus crawler on social media was promising [9].

Kangavalli, ATL et al, finds that with forums, reviews, online reviews and increasing sites for social networking, the current trend is to find reviews, expert opinions and discussions on the web so that the user can make informed decisions. Sentiment analysis, also known as opinion mining, is a computational study of the opinions, feelings, and emotions expressed in natural language processing and text analysis. The basic function is to classify the polarity of the text given on a document or line, whether the opinion expressed in the document or sentence is positive, negative or neutral. It can help for applications to better understand the behavioral patterns of users in social media [10].

First, the behaviors of individuals are collected through posts in their forums without their composition. Second, they are classified as positive / negative posts and clustering. Third, the

cases are encoded in terms of features in some numerical form, requiring conversion from text to numbers and assigning positive and negative values to each word to classify the word in the document [11] [12].Rhythm et al, proposes an algorithm for ranking web pages Internet social networking sites depends on the number of activity levels of their user members [14]. The authors develop an approach to determine which users have significant effects on the activities of other s using the longitudinal records of members log-in activity. The approach identifies the specific users who most influence others activity and does so [15].

3. Proposed Model – Page Rank

Different users were collected and ranked from the existing platform. Public discussions between extremist groups with different views lead to irreversible negotiations with abusive language and promote hate online hate and violence. Web forums are recognized for their thorough, vivid and spontaneous discussion nature. So for this reason, forum discussions do not take place effectively. The previous system was not effective in anticipating the user and retrieving the numbered page from the current web forum. The disadvantage of the system is that the ranking of an influential user in a web forum is not done effectively.

It includes the specifications and procedures for crawling data and the steps required to identify and rank users in web forums. The most important point is that the direct source information to the user should be reliable and not send illegal ideas to them. Such data is efficiently and intelligently filtered so that no original ideas are posted in the forum. With radical user identification, trust in information is gained and the web ranks.

PageRank is a numeric value that represents the importance of a page present on the web. When one page links to another, it is effectively voting for another page. More votes indicate more importance. A web page is important if it is directed by other important web pages. Google calculates the value of a page from the votes cast for it. The importance of each vote is taken into account when calculating the page rank of a page. Page rank is Google's way of determining the importance of a page. This is important because it is a factor that determines the ranking of a page in search results.

PageRank Notation- PR. Types of links

(1) Inbound links or inlinks, inbound links are external site links. A link is a way to increase the total page rank of a site. Sites are not penalized for inlinks.

(2) Outbound links or outlinks, outbound links are links from page to site or other pages of other sites.

(3) Swinging links, dangling links are just links that point to any page with no outgoing links. The internal link of a website has the maximum amount of page rank that is shared between its pages by internal links. Coefficient measures are best for sorting pages. The pagination algorithm uses many repetitions of calculations to calculate pagination.

The proposition is to analyze and find an influential user. The user can spread negative thoughts which can disrupt the society. There are also plans to identify the authenticity of each user's information and effectively rank web pages. Influential radical users are identified and ranked. It also identifies and ranks users' trusted information. To do this a database is created and each user's posts can be verified. The web forum also proposes to identify and eliminate dead users. The advantage of this system is that the ranking of an influential user in a web page is done effectively. Recognize how trustworthy a message posted by a user can be. Users are identified as active / dead users based on time / stamp.

4. Web Forum Accessing

Efficient evaluation of system values begins with a clear understanding of the structure and function of web forums. Web forums are a forum for internet discussion. People can communicate in the forum through messages posted on the web forum. The posted message may need to be approved by a moderator before it becomes visible depending on the user's access level or forum setup. A collection of posts is known as a thread. A message submitted by a user is known as a post. Members can edit or delete their own posts. Forums can monitor user post count. Users with low amount of posts and low amount of posts can be found.

A. User Groups

User group is classified into three groups. People who register and login to a web forum and post their comments are referred to as forum members. There is another group called forum visitors, who do not register in the forum but can access some pages and reviews in the forum. Moderators are also known as forum users or employees mode. Moderators give granted access to posts and therefore keep the forum clean from spam, spambots etc ... They know all the details about each user. They can add, delete, modify users' messages. Administrators also known as administrators are very important to run the site. They handle technical details. They have all the power of the stage. All important decisions of the forum are taken by them.

The authors find on an average, approximately one-fifth of a users friends actually influence his or her activity level on the social networking site data.. The users were classified into three distinct groups as level 1 network, level 2 network and their combination.

In level 1network a user is part of the network through established friendship link. In level 2 network a friend who is not a part of users level 1but is in the level 1 network of one of their friends. For these level 1 and level 2 networks login activity was taken as a function in regards of the users characteristics, users past behaviour on the site, the login activity of the users friends. The research on examining the users were sufficient to represent the activity levels of level 1 and level 2 friends. This does not imply that a friend has no effect on the user, rather it means that a friend has an effect only through level 1 user. Having many friends would make a user influential independent of the effects of other users. Users are more influenced by the members of the same ethnicity.

B. Ranking Model

The different modules used in the application be stated as the following : Forum Crawling and parsing, Data pre-processing, User Radicands Identification, User Trustfulness Identification, User Collocation identification, User Ranking.

Forum Crawling And Parsing - It is used to get the thread/comments list from the online WEB forum and remove the noise and special character/symbols. The web contains large data and it contains innumerable websites that is monitored by a tool or a program known as crawler. A crawler is a program that is used to download and store web pages.

Data Pre-Processing- The obtained data is organized as a collection of threads having a unique id and title; each thread containing one or more posts having a post id, time-stamp, body text, author, and quotations. In Preprocess, the downloaded forum pages web content are preprocessed and assign the attributes like forumid, forum subid, forum topic, forumurl.

User Radicalness Identification - It is used to discover that there exists an intimate relationship between the users interacting in same thread, and in the context of Web forums. When a user posts a message, it is checked by the moderator before it becomes visible in the forum. The Moderator verifies the post against the radical database formed and used by the web forum and if any match found with radical influential thoughts, the post is blocked by him and the user is ranked as a radical user. Whenever identify the user rank, we have to match with the list of existing horsing words and if we found any match against user post, then we have to ignore that post thread and remove owner of those post from the rank.

User Trustfulness Identification - Similar to the radical user identification, the post of an user can be verified and ranked against the truthiness of the message. A Database is created in the Webforum with the data that gives a good identity to the member of the web forum and hence the ranking.

User Collocation Identification - The term collocation can be defined as the association of users co-interacting in same threads. Therefore we apply the collocation theory to study the associatively of different users, and estimate their influence while propagating an ideology through their interactions. It is used to identify the Collocation from the user thread/post list to deal with increase the ranking percentage.

User Ranking - Once collocation identified, the user with more radical posts or the excellent words posts are identified or ranked compared with the users against WEB Forum. Two different algorithms are used to find the user rank. They are Page rank algorithm and MRR (Mean reciprocal rank) algorithm.

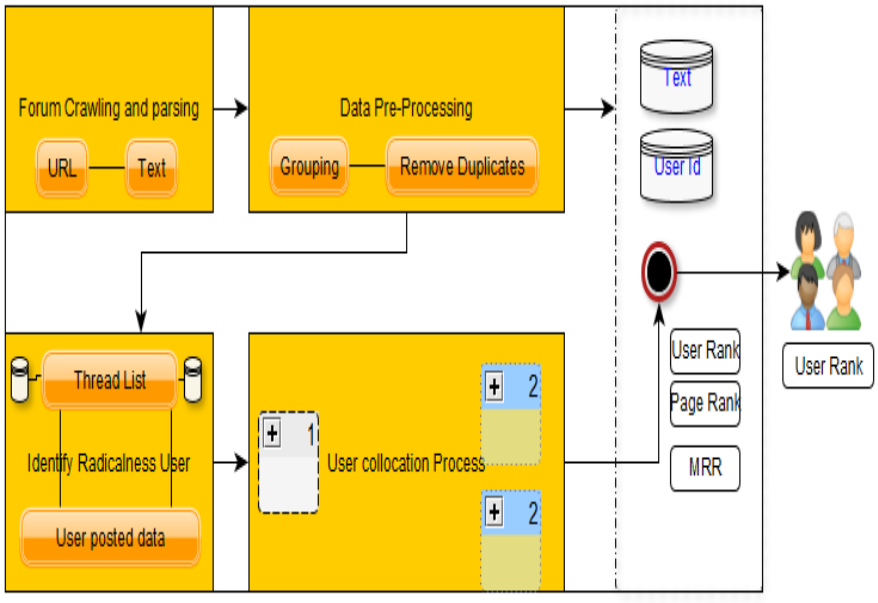

Fig. 1: Ranking Model with Data Processing

5. Experimental Setup

The two different types of Algorithms and Techniques used are Page rank algorithm and MRR (Mean reciprocal rank) algorithm. The page rank algorithm is used to determine the radicalness of a user and the mean rank algorithm is used to determine the trust of information posted by an user.

A. Page Rank Algorithm

It is given by

$$PR(A) = (1-d) + d\ (PR(T1)/C(T1) + \ldots +$$

PR(A) is the PageRank of page A,

PR(Ti) is the PageRank of pages Ti which link to page A,

C(Ti) is the number of outbound links on page Ti and

d is a damping factor which can be set between 0 and 1.

So, first of all the Page Rank does not rank web sites as a whole, but is determined for each page individually. Further, the Page Rank of page A is recursively defined by the Page Ranks of those pages which link to page A. The Page Rank of pages Ti which link to page A does not influence the Page Rank of page A uniformly. Within the Page Rank algorithm, the Page Rank of a page T is always weighted by the number of outbound links C(T) on page T.

```
cleanseText(blogPost) {
  // Remove any links from the blog post:
  blogPost['text'] = handleLinks(blogPost['text'])
  // Remove unwanted ads inserted by Google Ads etc. within the main text body:
  blogPost['text'] = removeAds(blogPost['text'])
  // Normalize contracted forms, e.g. isn't becomes is not (so that negation words are explicitly specified).
  blogPost['text'] = normalizeContractedForms(blogPost['text'])
  // Remove punctuation; different logic rules should be specified for each punctuation mark
  // You might not want to remove a hyphen surrounded by alphanumeric characters.
  // However you might want to remove a hyphen surrounded by at least one white space.
  blogPost['text'] = handlePunctuation(blogPost['text'])
  // Tokenize the text on white space, i.e. create an array of words from the original text.
  tokenizedText = tokenizeStatusOnWhiteSpace(blogPost['text'])
  // For each word, attempt to normalize it if it doesn't belong to the WordNet lexical database.
  for word in tokenizedStatus:
    if word not in WordNet dictionary:
      word = normalizeAcronym(word)
      // Further Natural Language Processing, POS Tagging
      ...
  return tokenizedText
}
```

```
<?xml version="1.0" encoding="UTF-8"?>
<rss [...] version="2.0">
  // RSS channel-specific tags:
  <channel>
    [...]
    <copyright>© Copyright The Financial Times Ltd 2012. "FT" and "Financial Times" are trademarks of the Financial Times.
See http://www.ft.com/servicestools/help/terms#legal1 for the terms and conditions of reuse.</copyright>
    <pubDate>Fri, 26 Oct 2012 09:42:18 GMT</pubDate> // Timestamp RSS was published at.
    <lastBuildDate>Fri, 26 Oct 2012 09:59:36 GMT</lastBuildDate> // Last built timestamp of the RSS.
    <webMaster>client.support@ft.com (Client Support)</webMaster> // Web master contact address.
    <ttl>15</ttl> // Time to live – the number of minutes the feed can stay cached before refreshing it from the source.
    <category>Newspapers</category> // RSS category.
    [...]
    // RSS feed-specific tags (e.g. below there is a news story): title, description, link, date published, article ID.
    <item>
      <title>Cynthia Carroll resigns at Anglo American</title>
      <link>http://www.ft.com/cms/s/0/d568891e-1f35-11e2-b2ad-
00144feabdc0.html?ftcamp=published_links%2Frss%2Fhome_uk%2Ffeed%2F%2Fproduct</link>
      <description>Cynthia Carroll departs the mining group following speculation for some time that she was under pressure
at the strike-hit company</description>
      <pubDate>Fri, 26 Oct 2012 07:33:44 GMT</pubDate>
      <guid isPermaLink="false">http://www.ft.com/cms/s/0/d568891e-1f35-11e2-b2ad-
00144feabdc0.html?ftcamp=published_links%2Frss%2Fhome_uk%2Ffeed%2F%2Fproduct</guid>
      <ft:uid>d568891e-1f35-11e2-b2ad-00144feabdc0</ft:uid>
    </item>
    [...]
  </channel>
</rss>
```

```
{
  "page":1,
  "query":"UCL",
  "results":[
    {
      "text":"UCL comes 4th in the QS World University Rankings. Good eh? http://bit.ly/PlUbsG",
      "date":"2012-09-11",
      "twitterUser":"uclnews"
    },
    {
      "text":"@uclcareers Like it!",
      "date":"2012-08-07",
      "twitterUser":"uclnews"
    }
  ],
  "results_per_page":2
}
```

Fig 2. Web Crawler Code Optimization and Rank Calculation

This means that the more outbound links a page T has, the less will page A benefit from a link to it on page T. The weighted Page Rank of pages Ti is then added up. The outcome of this is that an additional inbound link for page A will always increase page A's PageRank. Finally, the sum of the weighted PageRanks of all pages Ti is multiplied with a damping factor d which can be set between 0 and 1. Thereby, the extend of PageRank benefit for a page by another page linking to it is reduced.

Thus, it increases the crawling time of the crawler. Page flipping and clone mining are essential to make crawlers more efficient and increase crawler coverage. Destination pages of page flipping URLs have a layout similar to source pages. Clone mining is done to identify URLs that have the same structure but different data. Index-thread-flipping URLs are analyzed and patterns are racted. These regular expressions are used to remove page flipping URLs. This will help improve crawling technique, crawling accuracy and recall value. Various methods and techniques used to create efficient web crawlers. Web forums have different layouts, different formats and different types of pages.

B. Mean reciprocal rank algorithm

The mean reciprocal rank algorithm is also known as the MRR algorithm. It is the statistical criteria for evaluating any process that generates a list of possible responses to a sample of queries, dictated by the probability of accuracy. The reciprocal order of the query response is the inverse of the order of the first correct answer. Average reciprocal rank is the average of the reciprocal rank of results for a sample of queries. The exchange value of the average reciprocal rank corresponds to the harmonic average of the rank. For example, suppose we have the following three sample questions for the system that try to translate English words into their plural. In each case, the system makes three guesses, the first of which thinks it is probably correct. The final output will be the one who is the dominant user in the web forum with a check on the reliability of the messages posted by the user. It requires the development of two applications. They are, web application and standalone application

Web application - The web application will be a forum discussion application like Java-Ranch, Java-Forums, Stack-Overflow. This application will run on TomTom server and should have login number and registration pages. Whenever a user wants to post a question or post an answer, the user should log in to the app.

Stand alone application - The stand alone application is used to identify an influential user based on data set from a web forum. Whenever we identify a user order, we have to match the list of existing horsing terms and if we find a match against a user post, we have to ignore that post thread and remove the owner of that post from the rank. The data that exists is as follows. Finally, apply the MRR / PageRank algorithm to find the output. The final output will be in integer points. Based on those issues, we will have to publish a list of usernames on the screen at Rank wise.

Active / Dead User: According to our procedure, we must first identify the active / dead user based on their post and the timestamp of the user's goal. If the user means 'no longer login count', we have to group them and treat them as active / dead user. After that, we have to apply collocation theory in user posts / comments.

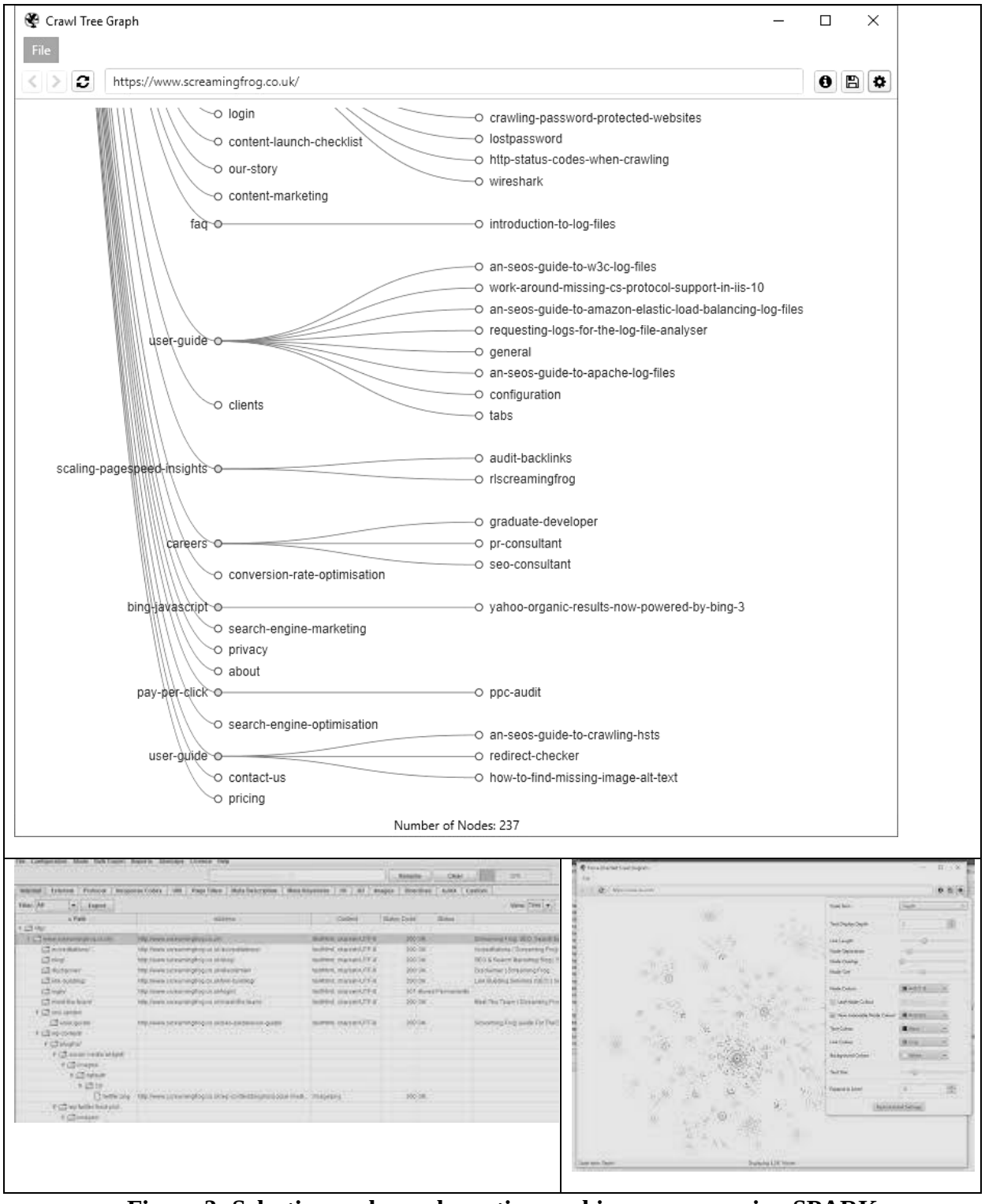

Figure 3: Selecting nodes and creating ranking process using SPARK

Web Crawler or a Bot or an Indexer is a program that visits Web sites for reading the content of pages and other information so that it can create index for search engine. Here, the aim of web crawler is to crawl relevant content from the Web Forum with minimal overhead. Forums are an open source portal for information exchange. Duplicate URL elimination as well

as grouping of Page Flipping URLs having similar layout is done. Web Forums have navigation paths which are similar that are connected by specific URL types which lead users from entry page to thread page. Last modified date of the post, number of the threads or posts is also collected to know about the updated thread or post. The precision and recall value achieved for the entry pages were 98.03% and 96.02% respectively. Crawler achieved 98.96% coverage and 98.32% effectiveness by eliminating irrelevant information and URLs.

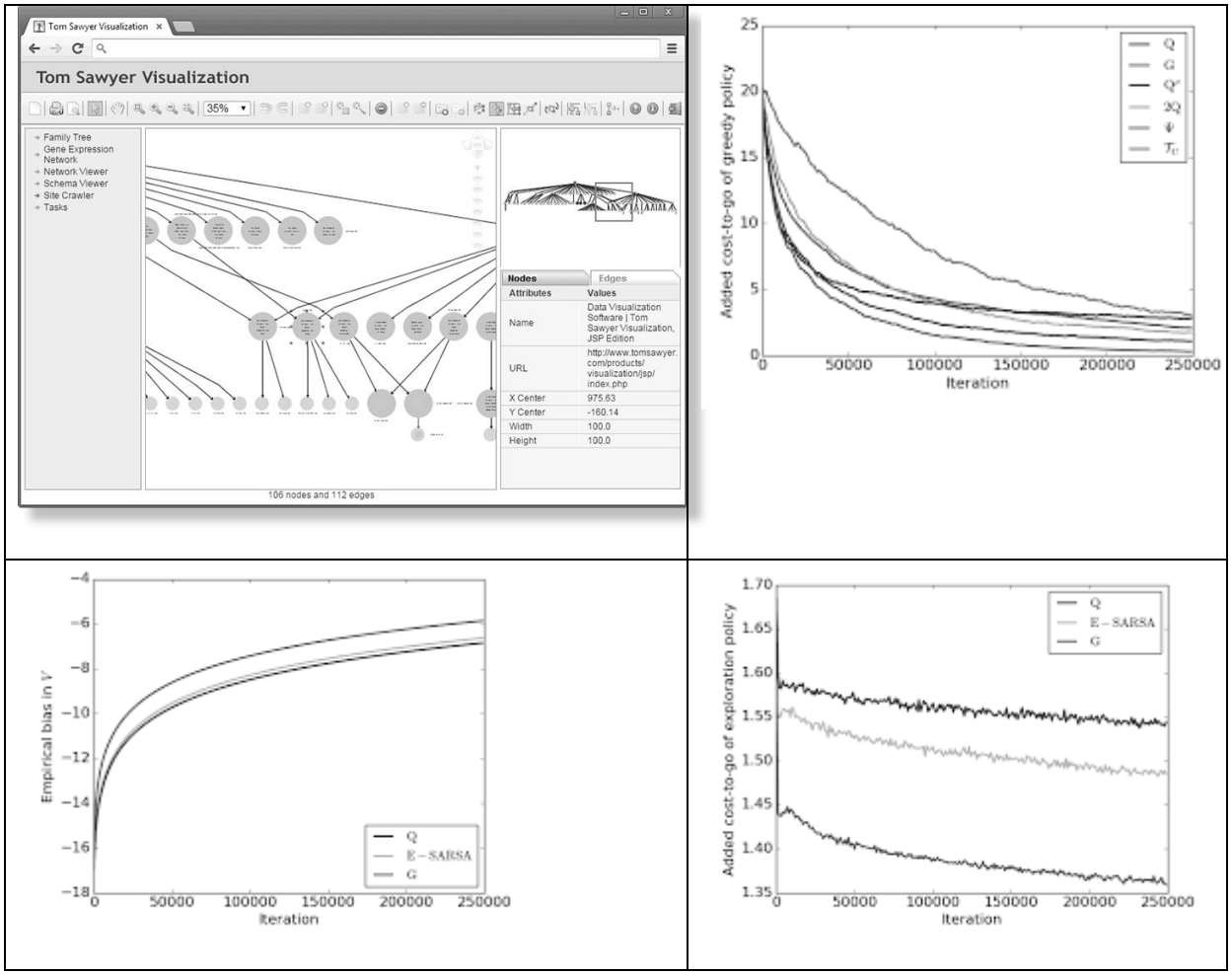

Figure 4. Experimental result of Ranking result of each user input using SPARK

The main disadvantage of our existing system is crawling of URLs which may lead users to same thread or page inside a forum. Thus, it increases the crawling time of the crawler. Page Flipping and Clone mining are very much required to make the crawler more efficient and increase the coverage of the crawler. Page Flipping URL's destination pages have similar layout as source pages. Clone mining is done to identify the URLs which have same structure but different data. Index-Thread-Flipping URLs are analyzed and patterns are extracted. These Regular expressions are used to eliminate Page Flipping URLs. This crawling technique thus will help to improve the precision and recall value of a crawler.

6. Conclusion

The proposed model is used to identify a numbered list of radically influential users in web forums. Measurements of radicalization were identified using fabrication databases and a variety of collocation-based connection measures. The probability of having a word in a post in the created threat list database is assessed using a customized rank. The user with the highest number of radical posts is ranked as the other following top D in the web forum. Connection theory is a measure that groups all the threads on the overall user. Experimental results on a standard data set are promising given the current user sequence algorithm. The system is in the process of identifying for the authenticity of the post posted by the user. Plan to enable the model with a larger database with more impressive terms in use. Websites getting real-time databases from online websites is a difficult task. The future process of getting a real-time database from a real working blog will have to be done in order to view their posts and identify and rank them. There is also a ranking of web pages. The basis of recognizing the authenticity of the post given by the user is started, more innovative ideas are planned towards this concept and therefore further work should be done towards it.

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