JOINT CONGESTION CONTROL AND ROUTING OPTIMIZATION: AN EFFICIENT

SECOND-ORDER DISTRIBUTED APPROACH

ABSTRACT

Distributed joint congestion control and routing optimization has received a significant amount of attention recently. To date, however, most of the existing schemes follow a key idea called the back-pressure algorithm. Despite having many salient features, the first-order subgradient nature of the back-pressure based schemes results in slow convergence and poor delay performance. To overcome these limitations, in this paper, we make a first attempt at developing a second-order joint congestion control and routing optimization framework that offers utility-optimality, queue-stability, fast convergence, and low delay. Our contributions in this paper are three-fold: i) we propose a new second-order joint congestion control and routing framework based on a primal-dual interior-point approach; ii) we establish utility-optimality and queue-stability of the proposed second-order method; and iii) we show how to implement the proposed second-order method in a distributed fashion.

C#.Net

SPEAKER VERIFICATION METHOD FOR OPERATION

SYSTEM OF CONSUMER ELECTRONIC DEVICES

ABSTRACT

A system is proposed that can remotely operate consumer electronic devices by voice. It uses the mobile phone as a controller. And it uses the CELP(code excited linear prediction) parameters that are used for speech coding in mobile phones. A speaker verification function protects private information and separates the user's voice from that of people nearby who are also speaking. A CELP-based speaker verification method is used to match the audio stream by comparing the trajectories of continuous phonemes. Experimental evaluation of the speaker verification method demonstrated the effectiveness of the proposed verification method.1.

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MAX-WEIGHT SCHEDULING IN QUEUEING NETWORKS WITH HEAVY-TAILED

TRAFFIC

ABSTRACT

We consider the problem of scheduling in a single-hop switched network with amix of heavy-tailed and light-tailed traffic and analyze the impact of heavy-tailed traffic on the performance of Max-Weight scheduling. As a performance metric, we use the delay stability of traffic flows: A traffic flow is delay-stable if its expected steady-state delay is finite, and delay-unstable otherwise. First, we show that a heavy-tailed traffic flow is delay-unstable under any scheduling policy. Then, we focus on the celebrated Max-Weight scheduling policy and show that a light-tailed flow that conflicts with a heavy-tailed flow is also delay-unstable. This is true irrespective of the rate or the tail distribution of the light-tailed flow or other scheduling constraints in the network. Surprisingly, we show that a light-tailed flow can become delay-unstable, even when it does not conflict with heavy-tailed traffic. Delay stability in this case may depend on the rate of the light-tailed flow. Finally, we turn our attention to the class of Max-Weight- scheduling policies. We show that if the –parameters are chosen suitably, then the sum of the -moments of the steady-state queue lengths is finite. We provide an explicit upper bound for the latter quantity, from which we derive results related to the delay stability of traffic flows, and the scaling of moments of steady-state queue lengths with traffic intensity.

C#.Net

A SURVEY ON AUDIO STEGANOGRAPHY APPROACHES

ABSTRACT

Today's internet community the secure data transfer is bounded due to its attack on data communication. Security of data can be achieved by implementing steganography techniques. All of the existing steganographic techniques use the digital multimedia files as a cover mediums to conceal secret data. Audio file use as a cover medium in steganography because of its larger size compare to other carrier's file such as text, image. So there are more possibilities to hide large amount of data inside digital audio file. Signals and digital audio files make suitable mediums for steganography because of its high level of redundancy and high data transmission rate. This is not easy to hide data in real time communication audio signals. In this paper we will survey the overall principles of hiding secret data in audio file using audio data hiding techniques, and deliver an overview of present techniques and functions and also discuss the advantages and disadvantages of different types of audio steganographic methods.

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A NOVEL APPROACH TO TRUST MANAGEMENT IN UNATTENDED WIRELESS

SENSOR NETWORKS

ABSTRACT

Unattended Wireless Sensor Networks (UWSNs) are characterized by long periods of disconnected operation and fixed or irregular intervals between sink visits. The absence of an online trusted third party implies that existing WSN trust management schemes are not applicable to UWSNs. In this paper, we propose a trust management scheme for UWSNs to provide efficient and robust trust data storage and trust generation. For trust data storage, we employ a geographic hash table to identify storage nodes and to significantly decrease storage cost. We use subjective logic based consensus techniques to mitigate trust fluctuations caused by environmental factors. We exploit a set of trust similarity functions to detect trust outliers and to sustain trust pollution attacks. We demonstrate, through extensive analyses and simulations, that the proposed scheme is efficient, robust and scalable.

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TEXT CLUSTERING USING HFRECCA AND ROUGH

K-MEANS CLUSTERING ALGORITHM

ABSTRACT

Hierarchical Fuzzy Relational Eigenvector Centrality-based Clustering Algorithm (HFRECCA) is extension of FRECCA which is used for the clustering of text data. Concepts present in natural language documents contain hierarchical structure and there are many terms present in the documents which are related to more than one theme hence HFRECCA will be useful algorithm for natural language documents. Rough kmeans clustering algorithm is worked with two boundaries i.e. upper boundary and lower boundary. Both algorithms providea provision where single object can belong to multiple clusters. Hence the algorithms HFRECCA and rough k-means clustering algorithm will be compared with each other on the basis of various parameters like execution time, memory required to find efficient algorithm.

VB.Net

A PROBABILISTIC MISBEHAVIOR DETECTION SCHEME TOWARDS EFFICIENT TRUST ESTABLISHMENT IN DELAY-TOLERANT NETWORKS

ABSTRACT

Malicious and selfish behaviors represent a serious threat against routing in Delay/Disruption Tolerant Networks (DTNs). Due to the unique network characteristics, designing a misbehavior detection scheme in DTN is regarded as a great challenge. In this paper, we propose iTrust, a probabilistic misbehavior detection scheme, for secure DTN routing towards efficient trust establishment. The basic idea of iTrust is introducing a periodically available Trusted Authority (TA) to judge the node's behavior based on the collected routing evidences and probabilistically checking. We model iTrust as the Inspection Game and use game theoretical analysis to demonstrate that, by setting an appropriate investigation probability, TA could ensure the security of DTN routing at a reduced cost. To further improve the efficiency of the proposed scheme, we correlate detection probability with a node's reputation, which allows a dynamic detection probability determined by the trust of the users. The extensive analysis and simulation results show that the proposed scheme substantiates the effectiveness and efficiency of the proposed scheme.

C#.Net

NOISE REDUCTION BASED ON PARTIAL-REFERENCE, DUAL-TREE COMPLEX

WAVELET TRANSFORM SHRINKAGE

ABSTRACT

This paper presents a novel way to reduce noise introduced or exacerbated by image enhancement methods, in particular algorithms based on the random spray sampling technique, but not only. According to the nature of sprays, output images of spray-based methods tend to exhibit noise with unknown statistical distribution. To avoid inappropriate assumptions on the statistical characteristics of noise, a different one is made. In fact, the non-enhanced image is considered to be either free of noise or affected by non-perceivable levels of noise. Taking advantage of the higher sensitivity of the human visual system to changes in brightness, the analysis can be limited to the luma channel of both the non-enhanced and enhanced image. Also, given the importance of directional content in human vision, the analysis is performed through the dual-tree complex wavelet transform (DTWCT). Unlike the discrete wavelet transform, the DTWCT allows for distinction of data directionality in the transform space. For each level of the transform, the standard deviation of the non-enhanced image coefficients is computed across the six orientations of the DTWCT, then it is normalized. The result is a map of the directional structures present in the non-enhanced image. Said map is then used to shrink the coefficients of the enhanced image. The shrunk coefficients and the coefficients from the non-enhanced image are then mixed according to data directionality. Finally, a noise-reduced version of the enhanced image is computed via the inverse transforms. A thorough numerical analysis of the results has been performed in order to confirm the validity of the proposed approach.

C#.Net

RESOURCE ALLOCATION FOR QOS SUPPORT IN WIRELESS MESH NETWORKS

ABSTRACT

Many next generation applications (such as video flows) are likely to have associated *minimum* data rate requirements in order to ensure satisfactory quality as perceived by end-users. In this paper, we develop a framework to address the problem of maximizing the *aggregate* utility of traffic flows in a multi-hop wireless network, with constraints imposed *both* due to self-interference and minimum rate requirements. The parameters that are tuned in order to maximize the utility are (i) transmission powers of individual nodes and (ii) the channels assigned to the different communication links. Our framework is based on using a *cross-decomposition* technique that takes both inter-flow interference and self-interference into account. The output of our framework is a schedule that dictates what links are to be activated in each slot and the parameters associated with each of those links. If the minimum rate constraint cannot be satisfied for all of the flows, the framework intelligently rejects a sub-set of the flows and recomputes a schedule for the remaining flows.We also design an admission control module that determines if new flows can be admitted without violating the rate requirements of the existing flows in the network.We provide numerical results to demonstrate the efficacy of our framework.

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ABSTRACT

Open nature of peer-to-peer systems exposes them to malicious activity. Building trust relationships among peers can mitigate attacks of malicious peers. This paper presents distributed algorithms that enable a peer to reason about trustworthiness of other peers based on past interactions and recommendations. Peers create their own trust network in their proximity by using local information available and do not try to learn global trust information Two contexts of trust, service, and recommendation contexts, are defined to measure trustworthiness in providing services and giving recommendations. Interactions and recommendations are evaluated based on importance, recentness, and peer satisfaction parameters. Additionally, recommender's trustworthiness and confidence about a recommendation are considered while evaluating recommendations. Simulation experiments on a file sharing application show that the proposed model can mitigate attacks on 16 different malicious behavior models. In the experiments, good peers were able to form trust relationships in their proximity and isolate malicious peers.

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SUPPORTING SEARCH-AS-YOU-TYPE USING SQL IN DATABASES

ABSTRACT

A search-as-you-type system computes answers on-the-fly as a user types in a keyword query character by character. We study how to support search-as-you-type on data residing in a relational DBMS. We focus on how to support this type of search using the native database language, SQL. A main challenge is how to leverage existing database functionalities to meet the high performance requirement to achieve an interactive speed. We study how to use auxiliary indexes stored as tables to increase search performance. We present solutions for both single-keyword queries and multi keyword queries, and develop novel techniques for fuzzy search using SQL by allowing mismatches between query keywords and answers. We present techniques to answer first-N queries and discuss how to support updates efficiently. Experiments on large, real data sets show that our techniques enable DBMS systems on a commodity computer to support search-as-you-type on tables with millions of records.

C#.Net

InfoSystem
Software Training and Development

A NEIGHBOR COVERAGE-BASED PROBABILISTIC REBROADCAST FOR REDUCING ROUTING OVERHEAD IN MOBILE AD HOC NETWORKS

ABSTRACT

Due to high mobility of nodes in mobile ad hoc networks (MANETs), there exist frequent link breakages which lead to frequent path failures and route discoveries. The overhead of a route discovery cannot be neglected. In a route discovery, broadcasting is a fundamental and effective data dissemination mechanism, where a mobile node blindly rebroadcasts the first received route request packets unless it has a route to the destination, and thus it causes the broadcast storm problem. In this paper, we propose a neighbor coverage-based probabilistic rebroadcast protocol for reducing routing overhead in MANETs. In order to effectively exploit the neighbor coverage knowledge, we propose a novel rebroadcast delay to determine the rebroadcast order, and then we can obtain the more accurate additional coverage ratio by sensing neighbor coverage knowledge. We also define a connectivity factor to provide the node density adaptation. By combining the additional coverage ratio and connectivity factor, we set a reasonable rebroadcast probability. Our approach combines the advantages of the neighbor coverage knowledge and the probabilistic mechanism, which can significantly decrease the number of retransmissions so as to reduce the routing overhead, and can also improve the routing performance.

C#.Net

A PROBABILISTIC MISBEHAVIOR DETECTION SCHEME TOWARDS EFFICIENT

TRUST ESTABLISHMENT IN DELAY-TOLERANT NETWORKS

ABSTRACT

Malicious and selfish behaviors represent a serious threat against routing in Delay/Disruption Tolerant Networks (DTNs). Due to the unique network characteristics, designing a misbehavior detection scheme in DTN is regarded as a great challenge. In this paper, we propose iTrust, a probabilistic misbehavior detection scheme, for secure DTN routing towards efficient trust establishment. The basic idea of iTrust is introducing a periodically available Trusted Authority (TA) to judge the node's behavior based on the collected routing evidences and probabilistically checking. We model iTrust as the Inspection Game and use game theoretical analysis to demonstrate that, by setting an appropriate investigation probability, TA could ensure the security of DTN routing at a reduced cost. To further improve the efficiency of the proposed scheme, we correlate detection probability with a node's reputation, which allows a dynamic detection probability determined by the trust of the users. The extensive analysis and simulation results show that the proposed scheme substantiates the effectiveness and efficiency of the proposed scheme.

C#.Net

A PROXY-BASED APPROACH TO CONTINUOUS LOCATION-BASED SPATIAL QUERIES IN MOBILE ENVIRONMENTS

ABSTRACT

Caching valid regions of spatial queries at mobile clients is effective in reducing the number of queries submitted by mobile clients and query load on the server. However, mobile clients suffer from longer waiting time for the server to compute valid regions. We propose in this paper a proxy-based approach to continuous nearest-neighbor (NN) and window queries. The proxy creates estimated valid regions (EVRs) for mobile clients by exploiting spatial and temporal locality of spatial queries. For NN queries, we devise two new algorithms to accelerate EVR growth, leading the proxy to build effective EVRs even when the cache size is small. On the other hand, we propose to represent the EVRs of window queries in the form of vectors, called estimated window vectors (EWVs), to achieve larger estimated valid regions. This novel representation and the associated creation algorithm result in more effective EVRs of window queries. In addition, due to the distinct characteristics, we use separate index structures, namely EVR-tree and grid index, for NN queries and window queries, respectively. To further increase efficiency, we develop algorithms to exploit the results of NN queries to aid grid index growth, benefiting EWV creation of window queries. Similarly, the grid index is utilized to support NN query answering and EVR updating. We conduct several experiments for performance evaluation. The experimental results show that the proposed approach significantly outperforms the existing proxy-based approaches.

C#.Net

EMAP: EXPEDITE MESSAGE AUTHENTICATION PROTOCOL FOR VEHICULAR AD HOC NETWORKS

ABSTRACT

Vehicular ad hoc networks (VANETs) adopt the Public Key Infrastructure (PKI) and Certificate Revocation Lists (CRLs) for their security. In any PKI system, the authentication of a received message is performed by checking if the certificate of the sender is included in the current CRL, and verifying the authenticity of the certificate and signature of the sender. In this paper, we propose an Expedite Message Authentication Protocol (EMAP) for VANETs, which replaces the time-consuming CRL checking process by an efficient revocation checking process. The revocation check process in EMAP uses a keyed Hash Message Authentication Code ð HMACÞ, where the key used in calculating the HMAC is shared only between non revoked On-Board Units (OBUs). In addition, EMAP uses a novel probabilistic key distribution, which enables non revoked OBUs to securely share and update a secret key. EMAP can significantly decrease the message loss ratio due to the message verification delay compared with the conventional authentication methods employing CRL. By conducting security analysis and performance evaluation, EMAP is demonstrated to be secure and efficient.

C#.Net

DATA SECURITY USING GRAPHICAL PASSWORD AND AES ALGORITHM FOR E-MAIL SYSTEM

ABSTRACT

The main intention of this project is Data Security using the Text-based Graphical password Schemas using color Combination for E-mail system. It secure users data from shoulder surfing attack. Since conventional password schemes are vulnerable to shoulder surfing, many shoulder surfing resistant graphical password schemes have been proposed. However, as most users are more familiar with textual passwords instead of pure graphical passwords. Unfortunately, none of existing text-based shoulder surfing resistant graphical password schemes is both secure and efficient enough. In this paper, we propose an improved text-based shoulder surfing resistant graphical password scheme by using colors for E-mail system. Access to computer systems is most often based on the use of alphanumeric passwords. However, users have interested on graphical password, therefore we have been proposed text based graphical password scheme for E-mail application . With the vast introduction of the wireless world, the exchanged information now is more prone to security attacks than ever. In this paper Encryption and decryption process also done to transfer data through E-mail securely. To make the Authentication between two intended users along with the security, server is used. With the help of server, both sender and receiver will get validated. In this project we have to use the Authentication purpose password Schemas using the Text Based Graphical password for the Login for E-mail system.

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MINING USER QUERIES WITH MARKOV CHAINS: APPLICATION TO ONLINE

IMAGE RETRIEVAL

ABSTRACT

We propose a novel method for automatic annotation, indexing and annotation-based retrieval of images. The new method, that we call Markovian Semantic Indexing (MSI), is presented in the context of an online image retrieval system. Assuming such a system, the users' queries are used to construct an Aggregate Markov Chain (AMC) through which the relevance between the keywords seen by the system is defined. The users' queries are also used to automatically annotate the images. A stochastic distance between images, based on their annotation and the keyword relevance captured in the AMC, is then introduced. Geometric interpretations of the proposed distance are provided and its relation to a clustering in the keyword space is investigated. By means of a new measure of Markovian state similarity, the mean first cross passage time (CPT), optimality properties of the proposed distance are proved. Images are modeled as points in a vector space and their similarity is measured with MSI. The new method is shown to possess certain theoretical advantages and also to achieve better Precision versus Recall results when compared to Latent Semantic Indexing (LSI) and probabilistic Latent Semantic Indexing (pLSI) methods in Annotation-Based Image Retrieval (ABIR) tasks.

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Software Training and Development

NETWORK ASSISTED MOBILE COMPUTING WITH OPTIMAL UPLINK QUERY PROCESSING

ABSTRACT

Many mobile applications retrieve content from remote servers via user generated queries. Processing these queries is often needed before the desired content can be identified. Processing the request on the mobile devices can quickly sap the limited battery resources. Conversely, processing user-queries at remote servers can have slow response times due communication latency incurred during transmission of the potentially large query. We evaluate a network-assisted mobile computing scenario where midnetwork nodes with "leasing" capabilities are deployed by a service provider. Leasing computation power can reduce battery usage on the mobile devices and improve response times. However, borrowing processing power from mid-network nodes comes at a leasing cost which must be accounted for when making the decision of where processing should occur. We study the tradeoff between battery usage, processing and transmission latency, and mid-network leasing. We use the dynamic programming framework to solve for the optimal processing policies that suggest the amount of processing to be done at each mid-network node in order to minimize the processing and communication latency and processing costs. Through numerical studies, we examine the properties of the optimal processing policy and the core tradeoffs in such systems.

C#.Net

NOISE REDUCTION BASED ON PARTIAL-REFERENCE, DUAL-TREE COMPLEX WAVELET TRANSFORM SHRINKAGE

ABSTRACT

This paper presents a novel way to reduce noise introduced or exacerbated by image enhancement methods, in particular algorithms based on the random spray sampling technique, but not only. According to the nature of sprays, output images of spray-based methods tend to exhibit noise with unknown statistical distribution. To avoid inappropriate assumptions on the statistical characteristics of noise, a different one is made. In fact, the non-enhanced image is considered to be either free of noise or affected by non-perceivable levels of noise. Taking advantage of the higher sensitivity of the human visual system to changes in brightness, the analysis can be limited to the luma channel of both the non-enhanced and enhanced image. Also, given the importance of directional content in human vision, the analysis is performed through the dual-tree complex wavelet transform (DTWCT). Unlike the discrete wavelet transform,

the DTWCT allows for distinction of data directionality in the transform space. For each level of the transform, the standard deviation of the non-enhanced image coefficients is computed across the six orientations of the DTWCT, then it is normalized. The result is a map of the directional structures present in the non-enhanced image. Said map is then used to shrink the coefficients of the enhanced image. The shrunk coefficients and the coefficients from the non-enhanced image are then mixed according to data directionality. Finally, a noise-reduced version of the enhanced image is computed via the inverse transforms. A thorough numerical analysis of the results has been performed in order to confirm the validity of the proposed approach.

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TARGET TRACKING AND MOBILE SENSOR NAVIGATION IN WIRELESS SENSOR NETWORKS

ABSTRACT

This work studies the problem of tracking signal-emitting mobile targets using navigated mobile sensors based on signal reception. Since the mobile target's maneuver is unknown, the mobile sensor controller utilizes the measurement collected by a wireless sensor network in terms of the mobile target signal's time of arrival (TOA). The mobile sensor controller acquires the TOA measurement information from both the mobile target and the mobile sensor for estimating their locations before directing the mobile sensor's movement to follow the target. We propose a min-max approximation approach to estimate the location for tracking which can be efficiently solved via semidefinite programming (SDP) relaxation, and apply a cubic function for mobile sensor navigation. We estimate the location of the mobile sensor and target jointly to improve the tracking accuracy. To further improve the system performance, we propose a weighted tracking algorithm by using the measurement information more efficiently. Our results demonstrate that the proposed algorithm provides good tracking performance and can quickly direct the mobile sensor to follow the mobile target.

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MINING CROSSCUTTING CONCERNS THROUGH RANDOM WALKS

ABSTRACT

In the present data warehousing environment schemes there are lots of issues in data maintenance scheme and penetrating techniques. The random walks are carried out on the thought diagram took out from the program sources to work out metrics of "utilization" and "aggregation" for each of the program constituent. It proves that the effectiveness of performance in retrieval tasks and data maintaining procedures. The outcome confirms previous claims regarding the unacceptable performance of these systems and underscores the need for standardization as exemplified by the community of users when evaluating these retrieval systems. The Random Walk produces the secured maintenance of data and Crosscutting Concern avoids the data duplication and data dependencies. We implemented the algorithm as the Prism CC miner (PCM) and evaluated PCM on Java applications ranging from a small-scale drawing application to a medium-sized middleware application and to a large-scale enterprise application server. Our quantification shows that PCM is able to produce comparable results (95% accuracy for top 125 candidates) with respect to the manual mining effort. PCM is also significantly more effective as compared to the conventional approach

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