Computer and Control Department

# Book of Abstracts

## Published Papers 2014

14

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|---|---|
| **Paper Title** | **Coloured Petri Net Model for Vector-Based Forwarding Routing Protocol** |
| **Authors** | Dina M. Ibrahim , Elsayed A. Sallam , Tarek E. Eltobely , and Mahmoud M. Fahmy |
| **Conf. or Journal Name** | The International Conference in Computing Technology and Information Management (ICCTIM2014), pp. 169-176, Dubai, UAE, 9-11 April, 2014. |
| **Abstract** | Modelling and simulation has an important role in understanding the performance of systems like Underwater Wireless Sensor Networks (UWSNs) before its implementation, where development and testing of actual system become expensive and time consuming. Special characteristics of underwater environments makes UWSNs meet many challenges. Many routing protocols for UWSNs were proposed in order to find out an efficient route between the sources and the sink. The aim of this paper is to use Coloured Petri Nets (CPNs) to model and analyze the behavior for one of the routing protocols in UWSNs, Vector-Based Forwarding routing protocol. CPNs are preferred for their ability to study and designate discrete event systems that are considered as concurrent, parallel and asynchronous. Our model is verified by two phases: First, by the state space statistics analysis which results that the proposed CPN model is liveness and free from deadlocks. Second, by the performance analysis in which demonstrates that the proposed model increases both the packet delivery ratio and the average end-to-end delay. |
| **Keywords** | *Modelling systems; Underwater Wireless Sensor Networks; Routing protocol; Coloured Petri Nets* |

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| **Paper Title** | **Enhancing the Vector-Based Forwarding Routing Protocol for Underwater Wireless Sensor Networks: A Clustering Approach** |
| **Authors** | Dina M. Ibrahim , Tarek E. Eltobely, Mahmoud M. Fahmy, and Elsayed A. Sallam |
| **Conf. or Journal Name** | The Tenth International Conference on Wireless and Mobile Communications (ICWMC 2014), Seville, **Spain**, 22-26 June, 2014. **[Best Paper Award].**<br><br>**http://www.iaria.org/conferences2014/awardsICWMC14/icwmc2014_a5.pdf** |
| **Abstract** | Underwater Wireless Sensor Networks (UWSNs) have an important role in different applications, such as offshore exploration and ocean monitoring. The networks consist of a considerably large number of sensor nodes deployed at different depths. Many routing protocols have been proposed in order to discover an efficient route between the sources and the sink. In this paper, we propose an algorithm to improve the performance of the Vector-Based Forwarding (VBF) protocol which we call a Clustering Vector-Based Forwarding algorithm (CVBF). In the proposed algorithm, the space volume of the network is divided into a number of clusters where one virtual sink is assigned to each cluster. Then, the nodes inside each cluster are allowed to communicate with themselves just to reach its virtual sink node, which in turn sends the packets to the main sink in the network. Simulation results demonstrate that the proposed algorithm reduces the energy consumption especially in dense networks, increases the packet delivery ratio especially in sparse networks, and decreases the average end-to-end delay in both sparse and dense networks. These advantages are emphasized when the algorithm is compared with four other powerful routing algorithms: VBF, Hop-by-Hop VBF (HH-VBF), Vector-Based Void Avoidance (VBVA), and Energy-Saving VBF (ES-VBF) routing protocols. |
| **Keywords** | *Wireless Networks; Underwater Sensor Networks; Multiple Clusters; Routing Protocols.* |

| Paper Title | **Modelling of CVBF Algorithm using Coloured Petri** **Nets** |
|---|---|
| **Authors** | Dina M. Ibrahim , Mahmoud M. Fahmy, Tarek E. Eltobely , and Elsayed A. Sallam |
| **Conf. or Journal Name** | The 9th IEEE International Conference on Computer Engineering and Systems (ICCES), Ain Shams University, pp. 26-31, Cairo, **Egypt**, 21-23 December, 2014. |
| **Abstract** | Modelling is a general method used throughout the development of systems. Numerous modelling languages were proposed for analyzing and building systems. Petri Nets language is considered as one of the formal modelling and analysis techniques. These techniques allow users to do both the performance evaluation and model checking. Coloured Petri Nets (CPN) is one of the modelling languages especially for discreteevent systems. In this paper, we use Coloured Petri Nets to model and analyze the behavior of the Clustering Vector-Based Forwarding (CVBF) routing protocol in Underwater Wireless Sensor Networks (UWSNs). Our proposed model is tested and verified by the state space statistics analysis which results that the proposed CPN model is liveness, responsiveness and free from deadlocks. The results of the performance evaluation of the proposed model demonstrate the proposed model capability to increase both the packet delivery ratio and the average end-to-end delay. |
| **Keywords** | |

| Paper Title | **An Enhanced Differential Evolution Optimization Algorithm** |
|---|---|
| **Authors** | M. Arafa, Elsayed A. Sallam, M. M. Fahmy |
| **Conf. or Journal Name** | International Conference on Digital Information and Communication Technology and Its Applications, (DICTAP 2014) Bangkok, Thailand, pp. 216-225, 6-8 May, 2014. |
| **Abstract** | The Differential Evolution (DE) algorithm, introduced by Storn and Price in 1995, has become one of the most efficacious population-based optimization approaches. In this algorithm, use is made of the significant concepts of mutation, crossover, and selection. The tuning control parameters are population size, mutation scaling factor, and crossover rate. Over the last decade, several variants of DE have been presented to improve its performance aspects. In the present paper, we further enhance DE. The population size and mutation scaling factor are taken alone in the tuning process; the crossover rate is treated implicitly in the crossover stage. Five forms for crossover are suggested for the first 100 iterations of the computational algorithm. After this learning period, we pick the form which yields the best value of the objective function in the greatest number of iterations (among the 100). Our algorithm is tested on a total of 47 benchmark functions: 27 traditional functions and 20 special functions chosen from CEC2005 and CEC2013. The results are assessed in terms of the mean and standard deviation of the error, success rate, and average number of function evaluations over successful runs. Convergence characteristics are also investigated. Comparison is made with the original DE and Success-History based Adaptive DE (SHADE) as a state-of-the-art DE algorithm, and the results demonstrate the superiority of the proposed approach for the majority of the functions considered. |
| **Keywords** | *Differential Evolution Algorithm, Optimization, Mutation, Crossover, Success-History Based Adaptive* |

| Paper Title | **Performance Comparison of Scheduling Algorithms for Real-Time Applications over WiMAX Networks** |
|---|---|
| **Authors** | Nada M. El-Shennawy, Mohmoud M. Fahmy,<br><br>Mohamed N. El-Derini, Mostafa A. Youssef (Alexandria University) |
| **Conf. or Journal Name** | |
| **Abstract** | WiMAX (Worldwide Interoperability for Microwave Access) is an emerging broadband wireless network for providing Last-mile problem solutions for supporting higher bandwidth and many service classes with dissimilar quality of service requirement. Real-time applications are widely implemented over the Internet. So the Internet needs a network access with strong support for these applications. There is an emerging broadband wireless access network, namely, WiMAX networks. WiMAX has efficient and reliable quality of service (QoS) architecture which can achieve the real-time applications requirements. A powerful scheduling algorithm is essential in WiMAX to fulfill the growth of using dissimilar applications. Video conferencing and high quality video are the most popular real-time applications. In this paper, we introduce performance comparison of some uplink scheduling algorithms to measure the enhancement of real-time applications performance. One of the algorithms considered is our proposal. Delay and jitter of applications are used as performance metrics. The results show that the proposed algorithm outperforms the other algorithms considered with respect to delay and jitter of real-time applications. |
| **Keywords** | *WiMAX, Scheduling Algorithm, QoS, Real-Time Applications* |

| Paper Title | **A Channel-Aware Uplink Scheduling Algorithm for Mobile WiMAX Networks** |
|---|---|
| **Authors** | Nada M. El-Shennawy, Mohmoud M. Fahmy, Mohamed N. El-Derini, Mostafa A. Youssef (Alexandria University) |
| **Conf. or Journal Name** | |
| **Abstract** | There has been a rapid growth of new Internet services, such as video conferences, online video games, and multimedia applications, offered to end users. These services need to satisfy their quality requirements, and thus an efficient scheduling algorithm is needed. In the literature, the interest is focused on throughput and delay as inputs to the scheduler in its bandwidth allocation decision. Jitter, though of great significance, did not receive considerable attention, yet. Researchers, in the area of WiMAX networks, often recommend weighted scheduling algorithms with dynamic weight functions. The channel quality is particularly important as well in scheduler decision in wireless networks for the determination of channel strength. In this paper, we develop an uplink channel-aware scheduling algorithm for mobile WiMAX networks. Use is made of a weight function with four terms: throughput, delay, jitter, and channel quality. A comparison is made between the proposed algorithm and two famous channel-aware algorithms, namely, proportional fair scheme (PFS) and maximum carrier-to-interference ratio (Max C/I). Simulation results, obtained by an OPNET simulator, reveal that our algorithm outperforms both PFS and Max C/I with respect to WiMAX delay and jitter, as functions of the number of mobile stations. However, the WiMAX throughput takes on a slightly lower value. For real-time applications, the algorithm is applied to a video conference and high quality video applications, and better values for both delay and jitter are attained in both application types. |
| **Keywords** | *WiMAX Networks; IEEE 802.16e; channel-aware algorithms; scheduling schemes; QoS* |

| Paper Title | **A Channel-Aware Uplink Scheduling Algorithm for Mobile WiMAX Networks** |
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| **Authors** | Nada M. El-Shennawy, Mohmoud M. Fahmy, Mohamed N. El-Derini, Mostafa A. Youssef (Alexandria University) |
| **Conf. or Journal Name** | |
| **Abstract** | There has been a rapid growth of new Internet services, such as video conferences, online video games, and multimedia applications, offered to end users. These services need to satisfy their quality requirements, and thus an efficient scheduling algorithm is needed. In the literature, the interest is focused on throughput and delay as inputs to the scheduler in its bandwidth allocation decision. Jitter, though of great significance, did not receive considerable attention, yet. Researchers, in the area of WiMAX networks, often recommend weighted scheduling algorithms with dynamic weight functions. The channel quality is particularly important as well in scheduler decision in wireless networks for the determination of channel strength. In this paper, we develop an uplink channel-aware scheduling algorithm for mobile WiMAX networks. Use is made of a weight function with four terms: throughput, delay, jitter, and channel quality. A comparison is made between the proposed algorithm and two famous channel-aware algorithms, namely, proportional fair scheme (PFS) and maximum carrier-to-interference ratio (Max C/I). Simulation results, obtained by an OPNET simulator, reveal that our algorithm outperforms both PFS and Max C/I with respect to WiMAX delay and jitter, as functions of the number of mobile stations. However, the WiMAX throughput takes on a slightly lower value. For real-time applications, the algorithm is applied to a video conference and high quality video applications, and better values for both delay and jitter are attained in both application types. |
| **Keywords** | *WiMAX Networks; IEEE 802.16e; channel-aware algorithms; scheduling schemes; QoS* |

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| **Paper Title** | **Fuzzy Watershed Segmentation Algorithm: An Enhanced Algorithm for 2D Gel Electrophoresis Image Segmentation** |
| **Authors** | Amany Sarhan, Muhamed Talaat Faheem and Shaheera Rashwan, Bayumy A.Youssef |
| **Conf. or Journal Name** | International Journal of Data Mining and Bioinformatics, Inderscience Publishers, 2014.  **Impact factor = 0.655** |
| **Abstract** | Detection and quantification of protein spots is an important issue in the analysis of two-dimensional electrophoresis images. However, there is a main challenge in the segmentation of 2DGE images which is to separate overlapping protein spots correctly and to find the weak protein spots. To enable comparison of protein patterns between different samples, it is necessary to match the patterns so that homologous spots are identified. In this paper, we describe a new robust technique to segment and model the different spots present in the gels. The Watershed segmentation algorithm is modified to handle the problem of over-segmentation by initially partitioning the image to mosaic regions using the composition of fuzzy relations. The experimental results showed the effectiveness of the proposed algorithm to overcome the over segmentation problem associated with the available algorithm. We also use a wavelet denoising function to enhance the quality of the segmented image. The parameters of the wavelet function are obtained using the Genetic Algorithm search technique. The results of using a denoising function before the proposed Fuzzy Watershed segmentation algorithm is very promising as they are better than those without denoising |
| **Keywords** | *Protein Spot Detection, Watershed Segmentation, over-segmentation, Fuzzy Relations* |

| Paper Title | **Aggregation of Similarity Measures in Schema Matching Based on Generalized Mean** |
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| **Authors** | Faten A Elshwimy, Alsayed A Algergawy, Amany M. Sarhan Sarhan and Alsayed A. Sallam |
| **Conf. or Journal Name** | IEEE 30th International Conference on Data Engineering Workshops (ICDEW), Chicago, IL, USA, pp. 74 - 79, March 31 - April 4 2014. |
| **Abstract** | Schema matching represents a critical step to integrate heterogeneous e-Business and shared-data applications. Most existing schema matching approaches rely heavily on similarity-based techniques, which attempt to discover correspondences based on various element similarity measures, each computed by an individual base matcher. It has been accepted that aggregating results of multiple base matchers is a promising technique to obtain more accurate matching correspondences. A number of current matching systems use experimental weights for aggregation of similarities among different element matchers while others use machine learning approaches to find optimal weights that should be assigned to different matchers. However, both approaches have their own deficiencies. To overcome the limitations of existing aggregation strategies and to achieve better performance, in this paper, we propose a new aggregation strategy, called the AHGM strategy, which aggregates multiple element matchers based on the concept of generalized mean. In particular, we first develop a practical way to obtain optimal weights that will be assigned to each associated matcher for the given aggregation task. We then use these weights in our aggregation method to improve the performance of matcher combining. To validate the performance of the proposed strategy, we conducted a set of experiments, and the obtained results are encouraging. |
| **Keywords** | *Schema Matching, XML schemas, Similarity Based Techniques, Aggregation Strategies, Harmony Aggregation, Generalized Mean* |

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|---|---|
| **Paper Title** | **A Dynamic Trust Computation Model for Peer to Peer Network** |
| **Authors** | Tarek Helmy |
| **Conf. or Journal Name** | Networks and Communications (NetCom2013), Lecture Notes in Electrical Engineering, Springer_verlage Publishers, vol. 284, pp. 93-106, Jan. 2014. |
| **Abstract** | Reliable Peer to Peer (P2P) communication has always been a challenging task for P2P system designers. Trust models try to alleviate problems in P2P systems by incorporating a variety of approaches and schemes. However, most of the current models measure the trustworthiness of a peer only by its trust value which results in inefficient mechanisms of dealing with malicious peers. This paper proposes a unique way of computing the trust value of peers in two steps; by computing the trust value of a peer after each transaction and computing the trust value after a periodic interval of time, namely the transactional trust and revised trust respectively. In the proposed P2P architecture, peers are distributed into groups and each group has a central peer which is responsible for the peers in its group. A management peer is used to manage the central peers and it takes care of all other management activities in the system. The simulation results validate the fact that the proposed trust computation model is accurate and computes the trust efficiently. |
| **Keywords** | *Peer to Peer, trustworthiness, trust computation model* |

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| **Paper Title** | **Diagnostic Performance of Pressure Drop Coefficient in Relation to Fractional Flow Reserve and Coronary Flow Reserve** |
| **Authors** | Tarek A Helmy,<br><br>Massoud A Leesar, Mohamed A Effat, Rupak K Banerjee (King Fahd University of Petroleum and Minerals, Dhahran, KSA) |
| **Conf. or Journal Name** | |
| **Abstract** | Functional assessment of coronary lesion severity during cardiac catheterization is conducted using diagnostic parameters like fractional flow reserve (FFR; pressure derived) and coronary flow reserve (CFR; flow derived). However, the complex hemodynamics of stenosis might not be sufficiently explained by either pressure or flow alone, particularly in the case of intermediate stenosis. CDP (ratio of pressure drop across a stenosis to distal dynamic pressure), a non-dimensional index derived from fundamental fluid dynamic principles based on a combination of intracoronary pressure and flow, may improve the functional assessment of coronary lesion severity. |
| **Keywords** | *Coronary Lesion, Pressure Derived, Flow Derived, Functional Assessment* |

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| **Paper Title** | **Functional Diagnosis of Coronary Stenoses Using Pressure Drop Coefficient: A Pilot Study in Humans** |
| **Authors** | Tarek A Helmy, <br><br> Kranthi K Kolli, Srikara V Peelukhana, Imran Arif, Massoud A Leesar, Lloyd H Back, Rupak K Banerjee, Mohamed A Effat (King Fahd University of Petroleum and Minerals, Dhahran, KSA) |
| **Conf. or Journal Name** | Catheterization and Cardiovascular Interventions Journal, Wiley Online Library, vol. 83, no. 3, pp. 377-385, 2014. |
| **Abstract** | Myocardial fractional flow reserve (FFR) in conjunction with coronary flow reserve (CFR) is used to evaluate the hemodynamic severity of coronary lesions. However, discordant results between FFR and CFR have been observed in intermediate coronary lesions. A functional parameter, pressure drop coefficient (CDP; ratio of pressure drop to distal dynamic pressure), was assessed using intracoronary pressure drop (dp) and average peak velocity (APV). The CDP is a nondimensional ratio, derived from fundamental fluid dynamic principles. We sought to evaluate the correlation of CDP with FFR, CFR, and hyperemic stenosis resistance (HSR: ratio of pressure drop to APV) in human subjects. |
| **Keywords** | *Coronary Disease; Stenosis; Cardiac Hemodynamics; Catheterization* |

| Paper Title | **Method of Predicting Gas Composition** |
|---|---|
| Authors | Tarek Ahmed Helmy El-Basuny, <br><br> Muhammad Imtiaz Hossain, Abdulazeez Abdulraheem, Moustafa Elshafei, Lahouari Ghouti, Amar Khoukhi, Syed Masiur Rahman, Md Rafiul Hassan (King Fahd University of Petroleum and Minerals, Dhahran, KSA) |
| Conf. or Journal Name | Patent no: US 8700549 B2, Publishing date: April 2014 |
| Abstract | The method of predicting gas composition in a multistage separator includes solutions to the regression problem of gas composition prediction that are developed using an ensemble of hybrid computational intelligence (CI) models. Three separate homogeneous and one heterogeneous ensemble of hybrid computational intelligence (EHCI) models are developed using a parallel scheme. The homogeneous models have the same types of CI models used as base learners, and the heterogeneous model has of different types of CI models used as base learners. Various popular CI models, including multi-layer perceptron (MLP), support vector regression (SVR) and adaptive neuro-fuzzy inference system (ANFIS), are used as base learners of ensemble models |
| Keywords | *Protein Spot Detection, Watershed Segmentation, over-segmentation, Fuzzy Relations* |

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| **Paper Title** | **Multi-Agent Based System for Multilingual Ontologies Maintenance** |
| **Authors** | Tarek Helmy<br><br>Saeed Albukhitan (King Fahd University of Petroleum and Minerals, Dhahran, KSA) |
| **Conf. or Journal Name** | International Joint Conferences IEEE/WIC/ACM on Web Intelligence (WI) and Intelligent Agent Technologies (IAT), Warsaw, pp. 419 – 423, 11-14 Aug. 2014 |
| **Abstract** | In the core of semantic Web, ontology works as the backbone for any semantic applications and technology. Maintaining ontologies is a major challenge for ontology researchers. Ontology maintenance process includes many tasks starting from combining smaller ones till versioning of the ontology. There are three different approaches to maintain ontologies: manual, semi-automatic and fully automatic approaches. Using an agent to maintain the ontology is a new emerging fully automatic approach where the ontology maintenance is done in a distributed manner. This work is part of a project where we are developing a framework for semantic manipulation of health and nutrition information. In this paper, we present an automatic ontology maintenance system using multi-agent based approach for multilingual ontologies related to food and health domains. The paper also highlights the challenges and complexities that may occur in multi-agent based systems which are being utilized for the purpose of maintenance of multilingual ontologies. |
| **Keywords** | *Semantic Web, Ontology, Semi-Automatic Approaches, Fully Automatic Approaches, Multilingual Ontologies.* |

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|---|---|
| **Paper Title** | **Semantic Annotation Tool for Annotating Arabic Web Documents** |
| **Authors** | Tarek Helmy, Saeed Al-Bukhitan, Mohammed Al-Mulhem (King Fahd University of Petroleum and Minerals, Dhahran, KSA) |
| **Conf. or Journal Name** | |
| **Abstract** | The vision of semantic Web is to have a Web of data instead of Web of documents in a form that can be processed by machines. This vision could be achieved in the existing Web using semantic annotation. Due to exponential growth and huge size of the Web sources, there is a need to have a fast and automatic semantic annotation of Web documents. Arabic language has received less attention in semantic Web research compared to Latin languages especially in the field of semantic annotation. In this paper, we present an automatic annotation tool that supports the semantic annotation of Arabic language Web documents. The tool takes a URL of Web document and the corresponding ontology then produces an external annotation of the Web document using Resource Description Framework (RDF) language. The annotation tool's output could be used by semantic search engines to achieve higher recall and precision. To evaluate the performance of the tool, three domain ontologies of food, nutrition and health were used with manually annotated documents related to those domains. The initial results show a promising performance which will support the research in the semantic Web with respect to Arabic language. |
| **Keywords** | *Semantic Web; Semantic Annotation; Arabic Language; Ontology* |

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|---|---|
| **Paper Title** | **User's Profile Ontology-based Semantic Framework for Personalized Food and Nutrition Recommendation** |
| **Authors** | Tarek Helmy, <br><br> Ahmed Al-Nazer, Mohammed Al-Mulhem (King Fahd University of Petroleum and Minerals, Dhahran, KSA) |
| **Conf. or Journal Name** | |
| **Abstract** | People depend on popular search engines, like Google and Yahoo, to retrieve the desired information from the Web. Searching for the right food, to eat, is an example of the frequent queries on the Web where people do not find relevant information easily. One reason for this un-satisfaction is the fact that many people have personal preferences where each one likes and dislikes certain food. Also, some people have specific health conditions that restrict their food choices and encourage them to take other food. In addition, the cultures, where people live in, influence food choices and varieties. Therefore, it will be helpful to develop a framework that provides food recommendation, what to take and what to avoid, increasing the advantages and reducing the risks especially for people who have long term diseases such as diabetes and high-blood-pressure. Since health and nutrition information is critical and hence people need to get precise information from trusted sources. Furthermore, transforming the implied knowledge about health and nutrition into structured data is challenging, so developing a framework that semantically manipulate the health and nutrition information is becoming an increasingly important research topic. In this paper, we harness semantic Web and ontology engineering technologies to analyze user's preferences, construct a nutritional and health oriented user's profile, and use the profile to organize the related knowledge so that users can make smarter food and health inquires. We present a semantic framework that uses the personalization techniques based on integrated domain ontologies, pre-constructed by domain experts, to recommend the relevant food that is consistent with people's needs. |
| **Keywords** | *Personalization; Query Manipulation; Food and Nutrition; Semantic Web; Ontology* |

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|---|---|
| **Paper Title** | **A Bidder Behavior Learning Intelligent System for Trust Measurement** |
| **Authors** | Amany M Sarhan and<br><br>El-sayed Towfek M El-kenawy, Ali Ibraheem El-desoky (Mansoura University) |
| **Conf. or Journal Name** | International Journal of Computer Applications, vol. 89, no. 8, pp. 12-18, March 2014. |
| **Abstract** | With the spread of e-commerce fields over the world especially an online auctions segment, the problems of internet crimes increased in the last years. The online auctions face a serious problem of trust among the participants where users have no information about the others, and have no relations among them except the commercial transactions; this allows fraud to occur by malicious users. We proposed a framework depend on "Bidder Behavior" consist of three algorithms the first " Bidder Increase Price Behavior"(BIPB), the second "Search In Stored Data Base"(SSDB) and the third "Person Recursive Search" (PRS) to improve the performance of trust measurement |
| **Keywords** | *e-commerce, fraud, Bidder, trust measurement* |

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|---|---|
| **Paper Title** | **A Latent Semantic Indexing-Based Approach to Determine Similar Clusters in Large-scale Schema Matching** |
| **Authors** | Alsayed Algergawy, Amany Sarhan, Seham Moawed, Ali Eldosouky  (Mansoura University) and Gunter Saake (Germany) |
| **Conf. or Journal Name** | New Trends in Databases and Information Systems: Contributions from ADBIS 2013, Advances in Intelligent Systems and Computing, Springer, vol. 241, pp. 267-276, 2014. |
| **Abstract** | Schema matching plays a central role in identifying the semantic correspondences across shared-data applications, such as data integration. Due to the increasing size and the widespread use of XML schemas and different kinds of ontologies, it becomes toughly challenging to cope with large-scale schema matching. Clustering-based matching is a great step towards more significant reduction of the search space and thus improved efficiency. However, methods used to identify similar clusters depend on literally matching terms. To improve this situation, in this paper, a new approach is proposed which uses Latent Semantic Indexing that allows retrieving the conceptual meaning between clusters. The experimental evaluations show encourage results towards building efficient large-scale matching approaches. |
| **Keywords** | *Schema Matching, Semantic Indexing, Data Integration, XML Schemas, Clustering-based Matching* |

| Paper Title | **Improving Clustering-based Schema Matching using Latent Semantic Indexing** |
|---|---|
| **Authors** | Alsayed Algergawy, Amany Sarhan, Seham Moawed, Ali Eldosouky  (Mansoura University) and Gunter Saake (Germany) |
| **Conf. or Journal Name** | |
| **Abstract** | The increasing size and the widespread use of XML data and different types of ontologies result in the big challenge of how to integrate these data. A critical step towards building this integration is to identify and discover semantically corresponding elements across heterogeneous data sets. This identification process becomes more and more challenging when dealing with large schemas and ontologies. Clustering-based matching is a great step towards more significant reduction of the search space and thus improving the matching efficiency. However, current methods used to identify similar clusters depend on literally matching terms. To keep high matching quality along with high matching efficiency, hidden semantic relationships among clusters' elements should be discovered. To this end, in this paper, we propose a Latent Semantic Indexing-based approach that allows retrieving the conceptual meaning between clusters. The experimental evaluations reveal that the proposed approach permits encouraging and significant improvements towards building large-scale matching approaches. |
| **Keywords** | *Schema Matching, Semantic Indexing, Data Integration, XML Schemas, Clustering-based Matching* |

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|---|---|
| **Paper Title** | **A Bidder Strategy System for Online Auctions Trust Measurement** |
| **Authors** | Amany M Sarhan<br><br>El-Sayed M Towfek El-kenawy, Ali Ibraheem El-Desoky (Mansoura University) |
| **Conf. or Journal Name** | |
| **Abstract** | In this paper, we investigate trust of the online auctions one of most e-commerce fields used today, with online auctions; users could buy/sell items all over the world. Compared to traditional auctions, online auctions bring greater convenience while dramatically decreasing the transaction cost., Participants' trust more important one, this paper propose new algorithm that depends on bidder Strategy System(BSS). |
| **Keywords** | *e-auction, reputation, trust, Bidder Strategy System, e-fraud* |

| Paper Title | **A Bidder Behavior Learning Intelligent System for Trust Measurement** |
|---|---|
| **Authors** | Amany M Sarhan<br><br>El-Sayed M Towfek El-kenawy, Ali Ibraheem El-Desoky (Mansoura University) |
| **Conf. or Journal Name** | International Journal of Computer Applications, vol 89, no. 8, pp. 12-18, March 2014. |
| **Abstract** | With the spread of e-commerce fields over the world especially an online auctions segment, the problems of internet crimes increased in the last years. The online auctions face a serious problem of trust among the participants where users have no information about the others, and have no relations among them except the commercial transactions; this allows fraud to occur by malicious users. We proposed a framework depend on "Bidder Behavior" consist of three algorithms the first " Bidder Increase Price Behavior"(BIPB), the second "Search In Stored Data Base"(SSDB) and the third "Person Recursive Search" (PRS) to improve the performance of trust measurement. |
| **Keywords** | *e-commerce, e-auction, reputation, trust, Bidder Strategy System, e-fraud* |

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|---|---|
| **Paper Title** | **New Web Cache Replacement Approaches Based on Internal Requests Factor** |
| **Authors** | Amany Sarhan, Ahmed M Elmogy and Sally Mohamed Ali |
| **Conf. or Journal Name** | Proceedings of the 9th IEEE International Conference on Computer Engineering & Systems (ICCES), Faculty of Engineering, Ain Shams University, pp. 383-389, 22-24 Dec. 2014. |
| **Abstract** | The increasing demand for World Wide Web (WWW) services has led to a considerable increase in the amount of Internet traffic. As a result, the network becomes highly prone to congestion which increases the load on servers, resulting in increasing the access times of WWW documents. Thus, Web caching is crucial for reducing the load on network, shorten network latency and improve clients' waiting time. Many web cashing systems and policies have been proposed to determine which objects to evict from the cache memory to accommodate new ones. Most of these systems and policies are mainly based on the enhancement of a well-known scheme called the Least Frequently Used (LFU) scheme. Although most of the proposed schemes could overcome the disadvantages of the LFU, they still have lots of overhead and are difficult to implement. This work proposes replacement approaches with better characteristics as they are easier to be implemented than the previous approaches. The proposed approaches consider the internal requests generated in each Web site. We added this factors to two famous approaches; LFU and Weighting Replacement Policy (WRP) to strength their performance. The experimental results indicate the superiority of the proposed approaches compared to both LFU and WRP, in terms of improvement in cache performance. |
| **Keywords** | *Web caching, cache Replacement Algorithms, Weighting Replacement Policy, Least Frequently Used Policy, Cache Performance* |

| Paper Title | **Verifiable e-voting system with receipt-freeness** |
|---|---|
| **Authors** | MM Badr, AM Sarhan, H Abdulkader (Menofia University) |
| **Conf. or Journal Name** | In Proceedings of the IEEE 10th International Computer Engineering Conference (ICENCO), Cairo University, Egypt, pp. 42-47, 29-30 Dec., 2014. |
| **Abstract** | Electronic Voting (e-voting) system has to achieve some basic security aspects in order to satisfy the confidence of the voters. Although e-voting is expected to be more efficient than the current traditional voting, e-voting is not used in a large scope. The main reason is the lack of the voter trust. It is a difficult challenge to design trustworthy e-voting system while maintaining receipt-freeness. In this paper, we propose a verifiable e-voting system that achieves the high level security aspects. Our system does not require either special devices, or frequent observations of voting machines. Our system produces unpredictable ballot and changes randomly between three possible encryption algorithms to ensure the security of the vote. Our system generates a receipt with a short and secure verification vote for each voter to enabling the voters to verify their votes. The receipt can reveal no evidence about how the voter votes in a particular way. This guarantees the receipt-freeness. |
| **Keywords** | *E-Voting System, Receipt-Freeness, Encryption Algorithms, Blowfish, Threefish, RC5, Skien Hashing* |

| Paper Title | **An Efficient Fusion Technique for Quality Enhancement of Remotely Sensed Images** |
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| **Authors** | Tarek A El-Tobely, Amr M Ragheb, S Khamis, Mohamed E Nasr, <br><br> Mohammed Amoon, Hanaa Abdallah, Saleh M Elkaffas, Fathi E Abd El-Samie (Menofya University) |
| **Conf. or Journal Name** | Applied Geomatics Journal, Springer Berlin Heidelberg, vol. 6, no. 3, pp. 197-205, Dec. 2014. |
| **Abstract** | Remote-sensing satellites provide both high-resolution panchromatic and low-resolution multi-spectral images. In this paper, a pixel-level multi-sensor image fusion technique is proposed for improving the spectral quality of the fused multi-spectral and panchromatic remote-sensing images. The proposed fusion technique integrates both the intensity, hue, and saturation (IHS) and the discrete wavelet frame transform (DWFT) techniques. IHS fusion technique can provide high spatial quality and the DWFT fusion technique is both aliasing free and translation invariant, but the color distortion in both techniques is noticeable. The proposed fusion technique can improve the spectral discrepancy of the fused images, while preserving the spatial quality to an acceptable level. Landsat-5 (TM) with Spot (Pan), Landsat-7 (ETM+), and IKONOS panchromatic and multi-spectral images have been fused using the proposed technique. The statistical analysis shows that this technique improves the fusion quality compared to the other known fusion techniques such as the conventional IHS, discrete wavelet transform (DWT), DWFT, and the integrated IHS and DWT. |
| **Keywords** | *Image fusion, Remote sensing, HIS, DWFT, Spectral quality.* |

| Paper Title | **Improving miRNA Classification Using an Exhaustive Set of Features** |
|---|---|
| **Authors** | Sherin M. ElGokhy,<br><br>Tetsuo Shibuya, and Amin Shoukry (Egypt-Japan University of Science and Technology E-JUST) |
| **Conf. or Journal Name** | |
| **Abstract** | MicroRNAs (miRNAs) are short (22 nucleotides), endogenously-initiated non-coding RNAs that control gene expression post transcriptionally, either by the degradation of target miRNAs or by the inhibition of protein translation. The prediction of miRNA genes is a challenging problem towards the understanding of post transcriptional gene regulation. The present paper focuses on developing a computational method for the identification of miRNA precursors. We propose a machine learning algorithm based on Random Forests (RF) for miRNA prediction. The prediction algorithm relies on a set of features; compiled from known features as well as others introduced for the first time; that results in a performance that is better than most well known miRNA classifiers. The method achieves 91.3% accuracy, 86% f-measure, 97.2% specificity, 93.4% precision and 79.6% sensitivity, when tested on real data. Our method succeeds in getting better results than MiPred (the best currently known RF algorithm in literature), Triplet-SVM and Virgo and EumiR. The obtained results indicate that Random Forests is a better alternative to Support Vector Machines (SVM) for miRNA prediction, especially from the point of view of accuracy and fmeasure metrics. |
| **Keywords** | *MicroRNA, Support Vector Machine, Random Forests* |

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|---|---|
| **Paper Title** | **Ensemble-Based Classification Approach for Micro-RNA Mining Applied on Diverse Metagenomic Sequences** |
| **Authors** | Sherin M. ElGokhy,<br><br>Mahmoud ElHefnawi and Amin Shoukry (Egypt-Japan University of Science and Technology E-JUST) |
| **Conf. or Journal Name** | BMC Research Notes, May 2014 |
| **Abstract** | MicroRNAs (miRNAs) are endogenous ~22 nt RNAs that are identified in many species as powerful regulators of gene expressions. Experimental identification of miRNAs is still slow since miRNAs are difficult to isolate by cloning due to their low expression, low stability, tissue specificity and the high cost of the cloning procedure. Thus, computational identification of miRNAs from genomic sequences provide a valuable complement to cloning. Different approaches for identification of miRNAs have been proposed based on homology, thermodynamic parameters, and cross-species comparisons. |
| **Keywords** | *MicroRNA, Support Vector Machine, Random Forests, Mirna Hairpin Prediction, Neural Network* |

| Paper Title | **CheckInside: A Fine-grained Indoor Location-based Social Network** |
|---|---|
| **Authors** | Moustafa Elhamshary,<br><br>Moustafa Youssef (Egypt-Japan University of Science and Technology E-JUST) |
| **Conf. or Journal Name** | |
| **Abstract** | Existing location-based social networks (LBSNs), e.g. Foursquare, depend mainly on GPS or network-based localization to infer users' locations. However, GPS is unavailable indoors and network-based localization provides coarse-grained accuracy. This limits the accuracy of current LBSNs in indoor environments, where people spend 89% of their time. This in turn affects the user experience, in terms of the accuracy of the ranked list of venues, especially for the small-screens of mobile devices; misses business opportunities; and leads to reduced venues coverage.<br><br>In this paper, we present CheckInside: a system that can provide a fine-grained indoor location-based social network. CheckInside leverages the crowd-sensed data collected from users' mobile devices during the check-in operation and knowledge extracted from current LBSNs to associate a place with its name and semantic fingerprint. This semantic fingerprint is used to obtain a more accurate list of nearby places as well as automatically detect new places with similar signatures. A novel algorithm for handling incorrect check-ins and inferring a semantically-enriched floorplan is proposed as well as an algorithm for enhancing the system performance based on the user implicit feedback.<br><br>Evaluation of CheckInside in four malls over the course of six weeks with 20 participants shows that it can provide the actual user location within the top five venues 99% of the time. This is compared to 17% only in the case of current LBSNs. In addition, it can increase the coverage of current LBSNs by more than 25%. |
| **Keywords** | *Indoor Positioning, Location-Based Social Networks, Semantics, Implicit Feedback* |

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|---|---|
| **Paper Title** | **Adaptive Actuator Failure Compensation Design for Unknown Chaotic Multi-Input Systems** |
| **Authors** | A. H. Tahoun |
| **Conf. or Journal Name** | International Journal of Adaptive Control and Signal Processing, Wiley Online Journals, April 2014. |
| **Abstract** | In this paper, an adaptive control approach is designed for compensating the faults in the actuators of chaotic systems and maintaining the acceptable system stability. We propose a state-feedback model reference adaptive control scheme for unknown chaotic multi-input systems. Only the dimensions of the chaotic systems are required to be known. Based on Lyapunov stability theory, new adaptive control laws are synthesized to accommodate actuator failures and system nonlinearities. An illustrative example is studied. The simulation results show the effectiveness of the design method. |
| **Keywords** | *Actuator Failure; Model Reference; Adaptive Control; Chaotic Systems; Multi-Input; Lyapunov Stability* |

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|---|---|
| **Paper Title** | **Fuzzy-Based Gain Scheduling Of Exact Feedforward Linearization Control And Sliding Mode Control for Magnetic Ball Levitation System: A Comparative Study** |
| **Authors** | A. Ramadan,<br><br>M. Lashin, A.T. Elgammal, A. A. Abouelsoud, Samy F.M. Assal, A. Abo-Ismail (Egypt-Japan University of Science and Technology E-JUST) |
| **Conf. or Journal Name** | |
| **Abstract** | This paper presents a comparative study between two control approaches; an Exact FeedForward Linearization controller developed by fuzzy-gain scheduling and sliding mode controller based on Ackermann and Utkin method. For the later one the sliding surface dynamics are determined explicitly without transforming to the sliding mode canonical form. The benefits of this study are demonstrated practically on a well known benchmark control problem, Magnetic ball levitation system (Maglev), and the performances of both controllers are compared. Important control issues such as tracking ability, control effort, steady state error and noise rejection are experimentally investigated. |
| **Keywords** | *Exact FeedForward Linearization Controller, Fuzzy-Gain Scheduling, Sliding Mode Controller, Ackermann and Utkin Method, Robotics* |

| Paper Title | **ANFIS based Jacobian for A Parallel Manipulator Mobility Assistive Device** |
|---|---|
| **Authors** | A. Ramadan, <br><br> A. Asker, O. Salah, A.M.R. Fath El-Bab, S.M.F. Assal, S. Sessa, A. Abo-Ismail (Egypt-Japan University of Science and Technology E-JUST) |
| **Conf. or Journal Name** | Proceedings of the IEEE International Conference on Control (UKACC), Loughborough, UK, pp. 395 - 400, 9-11 July, 2014 |
| **Abstract** | Nowadays parallel manipulators are used widely in bioengineering applications; this leads to many exciting expectations as well as challenges. The kinematic analysis of parallel manipulators with their differential kinematics yielding the Jacobian in a closed form is not a trivial task. In this paper a parallel manipulator based mobility assistive device called EJADII is analyzed to determine forward kinematics, inverse kinematics and closed-form Jacobian. An Adaptive Neuro-Fuzzy Inference System (ANFIS) is trained to estimate the Jacobian. This system would be useful when determination of the Jacobian in a closed-form is difficult to determine. The human motion during sit to stand captured by VICON experiment is used with two assisting scenarios to train and verify this system. Computer simulations show relatively good results of the proposed system. |
| **Keywords** | *Jacobian Matrices, Adaptive Control, Manipulator Kinematics, Mobile Robots, Neurocontrollers, Adaptive Neuro-Fuzzy Inference System (ANFIS)* |

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|---|---|
| **Paper Title** | **Workspace Mapping and Control of A Teleoperated Endoscopic Surgical Robot** |
| **Authors** | A. Ramadan, <br> A. Khalifa, K. Ibrahim, M. Fann, S. Assal, A. Abo-Ismail (Egypt-Japan University of Science and Technology E-JUST) |
| **Conf. or Journal Name** | Proceedings of the 19th International Conference On Methods and Models in Automation and Robotics (MMAR), Miedzyzdroje, Poland, pp. 675 - 680, 2-5 Sept., 2014 |
| **Abstract** | This paper presents the experimental implementation of a teleoperated endoscopic surgical manipulator system that uses PHANTOM Omni haptic device as the master. The 4-DOF, 2-PUU 2-PUS, endoscopic surgical parallel manipulator design is carried out using screw theory and Parallel virtual chain methodology to have larger bending angles and workspace volume. The master and slave devices of the teleoperation system are dissimilar in their kinematics and workspace volumes. A workspace mapping technique is implemented based on Position with Modied Rate Control to navigate through the slave workspace without annoying the user. To control the motion of the slave robot, a PID controller is used. The experimental results show the feasibility of the teleoperation surgical system using the 4-DOF parallel manipulator. Also, they indicate the efficiency of the implemented mapping technique and the designed controller to span the slave workspace with high dexterity and good tracking which allows the surgeon to perform the operation with high accuracy. |
| **Keywords** | *Bending, Control System Synthesis, Endoscopes, Manipulator Kinematics, Medical Robotics, Motion Control, Surgery, Telerobotics, Three-Term Control.* |

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|---|---|
| **Paper Title** | **Sit to Stand Sensing Using Wearable IMUs based on Adaptive Neuro Fuzzy and Kalman Filter** |
| **Authors** | A. Ramadan,<br><br>O. Salah, A.M.R. Fath El-Bab, S.M.F. Assal, S. Sessa, A. Abo-Ismail, M. Zecca, Y. Kobayashi, A. Takanishi, M. Fujie (Egypt-Japan University of Science and Technology E-JUST) |
| **Conf. or Journal Name** | |
| **Abstract** | This paper present a method for measuring the posture of a human body during different phases of sit to stand motion using inertial sensors. The proposed method fuses data from inertial sensors placed in trunk and thigh using Adaptive Neuro-Fuzzy Inference System (ANFIS) followed by a Kalman Filter (KF). The ANFIS attempts to estimate the position of shoulder of the human, at each sampling instant when measurement update step is carried out. The Kalman filter supervises the performance of the ANFIS with the aim of reducing the mismatch between the estimated and actual. The performance of the method is verified by measurements from VICON (motion analysis system). The obtained results show the effectiveness of the proposed algorithm in prediction the human shoulder position with root mean square error 0.018 m and 0.016 m in the x and y direction, respectively. |
| **Keywords** | *Kalman Filters, Biological Techniques, Biomechanics, Fuzzy Reasoning, Adaptive Neuro-Fuzzy Inference System, Motion Analysis System* |

| Paper Title | Design of an Optimized Sliding Mode Control for Loaded Double Inverted Pendulum with Mismatched Uncertainties |
|---|---|
| **Authors** | A. Ramadan,<br><br>M. Lashin, H.S. Abbass, A. Abo-Ismail (Egypt-Japan University of Science and Technology E-JUST) |
| **Conf. or Journal Name** | Proceedings of the IEEE 19th International Conference on Methods and Models in Automation and Robotics (MMAR),, Miedzyzdroje, Poland, pp. 270 - 275, 2-5 Sept., 2014. |
| **Abstract** | In this paper, the stabilization problem of loaded double inverted pendulum using an optimized state feedback sliding mode control is investigated. ADAMS/Matlab co-simulation environment is used for building a virtual nonlinear model for loaded double inverted pendulum system and the state feedback sliding mode control law is designed for stabilizing the system. Mismatched uncertainties represented by payload variations is considered. Genetic Algorithms are used to optimize the parameters of the sliding mode controller based on a performance index containing the sum of squared errors. The proposed control scheme can significantly suppress chattering effect and improves the performance of the system against uncertainties. Simulation results show the effectiveness of the approach and the robustness of the system against payload changes. |
| **Keywords** | *Stabilization Problem, Mismatched Uncertainties, Payload Variations, Virtual Nonlinear Model, Loaded Double Inverted Pendulum System* |

# Conferences Attended

| Staff Name | Nada Taha Elshenawy |
|---|---|
| **Conference Name** | The International Conference in Computing Technology and Information Management ICCTIM2014 |
| **Place** | Dubai, UAE |
| **Date** | April, 2014. |
| **With/Without paper** | With paper |

| Staff Name | Tahany Allam |
|---|---|
| **Conference Name** | The International Conference in Computing Technology and Information Management ICCTIM2014 |
| **Place** | Dubai, UAE |
| **Date** | April, 2014. |
| **With/Without paper** | With paper |

| Staff Name | Amro Elkholy |
|---|---|
| **Conference Name** | The International Conference in |
| **Place** | **Ain Shams University, Egypt** |
| **Date** | Dec. 2014. |
| **With/Without paper** | With paper |

| Staff Name | Ahmed Ramadan |
|---|---|
| **Conference Name** | The International Conference in |
| **Place** | |
| **Date** | , 2014. |
| **With/Without paper** | With paper |

| Staff Name | Marwa Badr |
|---|---|
| **Conference Name** | The International Conference in |
| **Place** | Cairo University**, Egypt** |
| **Date** | Dec, 2014. |
| **With/Without paper** | With paper |

| Staff Name | Dina Mahmoud |
|---|---|
| **Conference Name** | The International Conference in Computing Technology and Information Management (ICCTIM2014). |
| **Place** | Dubai, **UAE** |
| **Date** | 9-11 April, 2014. |
| **With/Without paper** | **With Paper** |

| Staff Name | Dina Mahmoud |
|---|---|
| **Conference Name** | The Tenth International Conference on Wireless and |

| | Mobile Communications (ICWMC 2014). |
|---|---|
| **Place** | Seville, **Spain** |
| **Date** | 22-26 June, 2014 |
| **With/Without paper** | **With Paper** |

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|---|---|
| **Staff Name** | Dina Mahmoud |
| **Conference Name** | The 9th IEEE International Conference on Computer Engineering and Systems (ICCES 2014). |
| **Place** | Cairo, **Egypt** |
| **Date** | 21-23 December, 2014 |
| **With/Without paper** | **With Paper** |

# Thesis Approved

| | |
|---|---|
| **Student Name** | **Mohamed Abddallah** |
| **Degree** | **Master** |
| **Thesis Title** | |
| **Supervisors** | |
| **Judgment Committee** | |

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|---|---|
| **Student Name** | **Faten Elshewemy** |
| **Degree** | **Master** |
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| **Supervisors** | |
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| **Student Name** | **Heba Ragab** |
| **Degree** | **Ph.D.** |
| **Thesis Title** | |
| **Supervisors** | |
| **Judgment Committee** | |

| Student Name | **Fatma Elgendy** |
|---|---|
| Degree | **Master** |
| Thesis Title | |
| Supervisors | |
| Judgment Committee | |

| Student Name | **Nada ElShenawy** |
|---|---|
| Degree | **Ph.D.** |
| Thesis Title | |
| Supervisors | |
| Judgment Committee | |

| Student Name | **Mohamed Arafa** |
|---|---|
| Degree | **Ph.D.** |
| Thesis Title | |
| Supervisors | |
| Judgment Committee | |

| Student Name | **Dina Ebrahem** |
|---|---|

| Degree | Ph.D. |
|---|---|
| Thesis Title | |
| Supervisors | |
| Judgment Committee | |

| Student Name | Amro Elkholy |
|---|---|
| Degree | Master |
| Thesis Title | |
| Supervisors | |
| Judgment Committee | |