

**CURRICULUM VITAE**  
**MAHMOUD IBRAHIM MAHMOUD MOUSSA**

**Personal Information:**

Name: Mahmoud Ibrahim Mahmoud Moussa

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Profession: Associate Professor of Computer Science, Faculty of Computers and Artificial Intelligence

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**Professional Appointments:**

Current Position (October 2012)	Associate Professor of Computer Science, Department of Computer Science, Faculty of Computers and Artificial Intelligence, Benha University.
August 2007-October 2012	Assistant Professor of Computer Science, Department of Computer Science, Faculty of Computers and Artificial Intelligence, Benha University
October 2005-August 2007	Assistant Professor of Computer Science, Department of Mathematics Computer Science, Faculty of Science, Benha University
September 1999-October 2005	Assistant Lecturer of Computer Science, Department of Mathematics Computer Science, Faculty of Science, Benha University

**Education:**

June 2005	PhD in Computer & Information Sciences, Theoretical Computer Science Department, Faculty of Information, Karlsruhe University, Karlsruhe, Germany.
April 1999	M.Sc. in Mathematics & Computer Science, Mathematics Department, Faculty of Science, Benha University Faculty of Science, Benha University, Egypt.

August 1993

B.Sc. in Mathematics, Department of Mathematics Computer Science, Faculty of Science, Benha University.

### Research Interests

- Parallel computation
- Chemoinformatics Algorithms
- Bioinformatics Algorithms
- Graph Application
- Data hiding and Cryptography

### ACADEMIC & PROFESSIONAL EXPERIENCES

- October 2012 up to date Associate Professor of Computer Science Computer Science Department, Computers and Artificial Intelligence, Benha University.
- October 2012-August 2013 Head of Computer system Department, Computers and Artificial Intelligence, Benha University
- August 2007 Manager of quality Unit, Computers and Artificial Intelligence, Benha University
- October 2005 Coordinate of Computer science Branch in Mathematics Department, Faculty of Science, Benha University
- April 1994 Assistant lecturer Mathematics Department, Faculty of Science, Benha University

### Teaching Statement:

- 1- **C++ Programming Language:** This course teaches the student to apply fundamental procedural programming concepts, principles and constructs (such as data types, common control flow structures, basic data structures, and console input/output will be presented) to the programming language C++. The course makes the student to describe procedural programming using C++ and to increase the depth of students' knowledge about several implementation issue. At the end of the course, a student completing this course will be able to: Apply elementary techniques involving arithmetic operators and mathematical expressions in C++ programming. Choose an appropriate data type to represent data. Write C++ programs that use selection, loops, pointers, arrays, sorting and searching. Solve programming problems using C++.
- 2- **Object Oriented Programming in Java:** This course will provide the student with a basic foundation in Java syntax, such as, Variables, Data types and Operators. Expressions, Statements, Code blocks, Control Flow Statements.OOP Part 1 - Classes, Constructors and Inheritance. OOP Part 2 - Composition, Encapsulation, and Polymorphism. Arrays.
- 3- **Design and analysis of algorithms:** The course introduces students to the analysis and design of algorithms. Upon completion of this course, students will be able to do the following: Sequential computer & sequential algorithms. Simple recursive algorithms, Backtracking algorithms, Divide and conquer algorithms, Dynamic programming algorithms, Greedy algorithms, Branch and bound algorithms, Brute force algorithms, graph algorithms

and Randomized algorithms. Analyze the performance of the algorithms and demonstrate a familiarity with major algorithms and data structures.

- 4- Data structures and application with C++:** Explain the concepts of data structures and their uses within programming and their relation to algorithms. Three classes of data structures are explained: the initial class of data structures includes for example; array, stacks, queues, the second class is the dynamic data structures like Linked list, trees, heaps, and hash tables and the advanced data structures like binomial heaps, Fibonacci heaps, and graph algorithm. The comparison between all these types is take place and how the student selects the best and more efficient data structures according to the algorithm. Multiple examples of data structures and applications using the language of C++ are introduced in this course.
- 5- Distributed Computing System:** This module aims to advance knowledge on computer networks. Topics to be covered in this module include OSI reference model, Physical and Data Link Layer Protocols, TCP/IP Networking, IPv6, Routing Protocols. Introduces what is achievable using security engineering and presents the practical techniques and algorithms that are currently important for the efficient and secure use of distributed /Grid computing systems. Topics include Introduction to Security Engineering, and Cryptography. Presents the principles of distributed systems architectures, covering applications, algorithms and software architecture, engineering issues and implementation technology. Topics to be covered in this module include System Architecture (Bus Systems, High Performance I/O, Memory Hierarchies, Memory Coherence and File Coherence), Distributed Database, Processor Architecture, File Services, Inter-Process Communication, Naming Services, Resource Allocation and Scheduling, Distributed System Case Studies.
- 6- Parallel computer and parallel algorithm:** The course provides the students with the capability to understand the following: The need for parallel computation, parallel Random Access Machine (PRAM). Classification of PRAM; shared memory architectures (EREW model, ERCW model, CREW model and CRCW-model), distributed memory, the binary tree networks, the pyramid networks, distributed shared memory architectures. Parallel complexity theory, parallel algorithms examples, parallel computation techniques; prefix sum, lexicographic order, pipelined & nonpipelined, parallel partitioning and parallel classification.
- 7- Cryptography & Data Hiding:** This course will teach the essentials of cryptology focusing on classical encryption techniques, encryption algorithm, secret key and key space, encryption techniques like substitution and transposition, a very large key space and statistical attack, review modular arithmetic & polynomial arithmetic, factorization of large numbers, des, public-key & RSA, authenticated public keys, AES. This course will teach the essentials of steganography focusing on hiding data based on DNA.
- 8- Cryptography & Computer Security:** The course introduces the student to the security and confidentiality of computers and networks, the encryption of messages sent over Internet, types and methods of encryption and decryption, the various types of secret keys and how to manage the keys. How the student takes advantage of the theory of preparation to strengthen the process of encryption and the methods used to break the encryption and to overcome these methods. Up to date with the latest encryption algorithms and cryptography technologies. Topics include Introduction to Security Engineering, Classical

Cryptography (Monoalphabetic and Polyalphabetic Ciphers, Transposition, Substitution, Linear Transformation), Computational Fundamentals of Cryptosystems (Computational Complexity and Intractability, Modular Arithmetic and Elementary Number Theory), Modern Symmetric Key Cryptography (DES, Triple-DES and AES), Public Key Cryptography (The Diffie-Hellman-Key, Exchange Algorithm, Public-Key Infrastructures, RSA and Elliptic Curves).

- 9- **Graph Theory:** The course will teach the essentials of graphs & directed graphs, random graph, bipartite graphs, degree sequence of graph, walks, trails, paths, circuits, connectivity, components, graph operations, Hamiltonian circuit, cuts, planarity and planar embedding, labeled graphs and graph isomorphism, trees and forests, representation of graphs in computer and adjacency matrices. the course will teach graph algorithms; Reachability algorithms, depth-first and breadth-first searches, Dijkstra's algorithm, Kruskal's and prim's algorithms, travelling salesman's problem, matching in graphs, maximum independent sets and coloring problem.

#### **Participation in Supervising Master \ Ph. D Students**

- Ahmed Hassan Abu El-Atta (Ph.D Student) "A Novel Algorithm for Detection of unknown Chemical Molecules with Specific Biological Activities ,2018"
- Naglaa Fathy (Master Student) "Image encryption chaotic based on system, 2015"
- Fatima El-Sayed (Master Student)" Enhancement of Data Hiding Techniques Based on DNA Computing 2015"
- Mostafa El-Gendy (Master Student)" Towards Augmenting Computing Capabilities of Mobile Applications Using Cloud Computing, 2016"
- Mahmoud Sobhy(Master Student)" Using artificial intelligence algorithms for discovering the subgraphs from a graph data set, 2018"
- Samar Kamal (Master Student)" Using Graphsearching Algorithms for discovering Protein-Protein Interactions network, 2020"
- Eman Mahmoud (Master Student)" Data Encryption and Hiding Methods Using DNA Sequence, 2017".
- Ahmed Hassan Abu El-Atta (Master Student) "On Application of Stable Matching Algorithms,2010"
- Fathy El-kazaz(Master Student) "Visualization of the multi-objective transportation problem,2011"

#### **Activities and Memberships**

- International Association of Computer Science and Information Technology (IACSIT)
- International Journal of Computer and Electrical Engineering (IJCEE)
- International Journal of Engineering and Technology (IJET).
- International Journal of Ars Combinatoria International Journal on applications of graph theory in wireless ad hoc networks and sensor networks (GRAPH-HOC)
- The conference committees of ICGIP 2011 (2011 International Conference on Graphic and Image Processing, Cairo, Egypt. October 1-3, 2011), have selected me as the reviewers of ICGIP 2011
- International Journal of Mathematics and Engineering Research (IJMER)

#### **Computer Skills**

- Microsoft Office, ICDL, LaTeX & Linux
- Pascal, Visual C++, Java, Python besides familiarity with the C language and MATLAB
- Parallel Programming: Message Pass Interface MPI.

### Training Courses

- Statistical Analysis January 2018 F.L.D.C. Benha university
- Scientific & Academic Publishing January 2018 F.L.D.C. Benha university
- Time Management and Effective Meeting January 2018 F.L.D.C. Benha university
- Self-Assessment and External Examination April 2016 F.L.D.C. Benha university
- Web-Site Management March 2016 F.L.D.C. Benha university
- ICT Training April 2012 M.D. P. - Banha University
- Organizing Scientific Conferences April 2012 F.L.D.C. Benha university
- University Administration May 2012 F.L.D.C. Benha university Financial & Legal Aspects of University May 2012 F.L.D.C. Benha university Work

### Refereed Journal\Conference Papers

- Mahmoud I. Moussa & E. M. Badr" An upper bound of radio k-coloring problem and its integer linear programming model" Journal Wireless Networks 2019, Volume 25, pages 1-10.
- Mahmoud I. Moussa & E. M. Badr" A Data Hiding Algorithm Based on DNA and Elliptic Curve Cryptosystems" Journal of Information Hiding and Multimedia Signal Processing (JIHMSP) 2019, Volume 10, issue 3, pages 458-469.
- M Mousa, S Kamal" CoreAlign: Core-based Global Alignment for Protein-Protein Interaction Networks" International Journal of Computer Applications 178 (53), 5-11
- Mahmoud I. Moussa "A Data Hiding Algorithm Based on DNA and Elliptic Curve Cryptosystems" Journal of Information Hiding and Multimedia Signal Processing, preprinted 2018
- Ahmed El-Sway, Mahmoud I. Moussa & Mahmoud Sobhy." Feature Selection approach for Chemical Compound Classification based on CSO and PSO", Journal of Convergence Information Technology 12 (2), 2017
- A H. Abu El-Atta, Mahmoud I. Moussa & Aboul Ella Hassanien Two-class support vector machine with new kernel function based on paths of features for predicting chemical activity, Information Sciences 403, 42-54, 2017.
- Mahmoud I. Moussa & E. M. Badr" Ladder and Subdivision of Ladder Graphs with Pendant Edges are Odd Graceful" International Journal on Applications of Graph Theory in Wireless Ad Hoc Networks and Sensor Networks (Graph-Hoc), March 2016, Volume 8, Number 1. 4
- Eman I. Abd El- Latif and Mahmoud I. Moussa "Chaotic Information-hiding Algorithm based on DNA" International Journal of Computer Applications (0975 – 8887) Volume 122– No.10, August 20, 2015
- Ahmed H. Abu El-Atta, Mahmoud I. Moussa & Aboul Ella Hassanien Predicting Activity Approach based on New Atoms Similarity Kernel Function, Journal of molecular graphics & modelling 60, pages 55-62, June 2015
- Fatma E. Ibrahim, Mahmoud I. Moussa & H. M. Abdalkader" Enhancing the Security of Data Hiding Using Double DNA Sequences" Industry Academia Collaboration Conference (IAC), 6-8, 2015 7

- Fatma E. Ibrahim, Mahmoud I. Moussa & H. M. Abdalkader "A Symmetric Encryption Algorithm based on DNA Computing" International Journal of Computer Applications (0975 – 8887) Volume 97– No.16, July 2014.
- Mostafa A. Elgendy, Ahmed Shawish and Mahmoud I. Moussa" An Enhanced Version of the MCACC to Augment the Computing Capabilities" International Journal of Advanced Computer Science and Applications 2014 9
- Ahmed H. Abu El-Atta, Mahmoud I. Moussa & Aboul Ella Hassanien "Predicting Biological 9 Activit of 2,4,6-trisubstituted 1,3,5-triazines Using Random Forest" Bio-Inspired Comput. and Appl. IBICA 2014, Advances in Intelligent Systems and Computing.
- Mostafa A. Elgendy, Ahmed Shawish and Mahmoud I. Moussa" MCACC: New Approach for Augmenting the Computing Capabilities of Mobile Devices with Cloud Computing" Science and Information Conference 2014 (SAI 2014) August 2014 London, UK.
- Fatma E. Ibrahim, Mahmoud I. Moussa & H. Abdalkader "Enhancing the Security of Data Hiding Using Double DNA Sequences" Industry Academia Collaboration Conference (IAC), 6-8 2014.
- Mostafa A. Elgendy, Ahmed Shawish and Mahmoud I. Moussa" Enhancing Mobile Devices Capabilities in Low Bandwidth Networks with Cloud Computing" International Conference on Advanced Machine Learning Technologies and Applications Pages 97-108 Publisher Springer, Cham 2014.
- N. F Elabady, M. I Moussa, H. Abdalkader, S. Sabbeh "Improving the Security of Image Encryption by using Two Chaotic Maps" International Journal of Computer Applications (0975 – 8887) 108 (19), 27-32
- Mahmoud I. Moussa & E. M. Badr" On Jump-Critical Ordered Sets with Jump Number Four" Journal of Advances in Applied & Computational Mathematics 1, 8-13 2014.
- Mahmoud. I. Moussa "A Visual Comparative Study of Multi-Objective Transportation Problem in Several Approaches" International Journal of Management & Information Technology Vol. 7, No. 1, 902-911, 2013.
- Mahmoud I. Moussa & E. M. Badr" A New Parallel Algorithm for Computing Minimum Spanning Tree" International Journal of Soft Computing, Mathematics and Control (IJSCMC), Vol.2, No.2, February 2013.
- N. F Elabady, M. I Moussa, H. Abdalkader, S. Sabbeh "Image Encryption Based on New OneDimensional Chaotic Map" Second International Conference on Engineering and Technology
- Mahmoud I. Moussa & E. M. Badr "Odd Graceful Labelings of Cyclic Snakes" Electronic Journal of Nonlinear Analysis and Application 2012; 6:115-119
- Mahmoud I. Moussa & E. M. Badr "A Computational Study for the Graph-Theoretic Version of the Union-Closed Sets Conjecture" International Journal of Computer Applications 50(12):1-5, March 2012. Published by Foundation of Computer Science.
- Mahmoud I. Moussa, E. M. Badr & K. M. Kathiresan" Crown Graphs and Subdivision of Ladders are Odd Graceful" International Journal of Computer Mathematics, Vol. 88, No.17, 1-7, iFirst 2011
- Mahmoud I. Moussa and Ahmed H. Abu El-Atta "A Visual Implementation of Student Project Allocation" International Journal of Computer Theory and Engineering Volume 3, No. 2, PP. 178-184, 2011
- Mahmoud I. Moussa "An Algorithm for Odd Gracefulness of the Tensor Product of Two Line Graphs" International Journal on Applications of Graph Theory in Wireless Ad Hoc Networks and Sensor Networks (GRAPH-HOC), March 2011, Volume 3, Number1.

- Mahmoud I. Moussa "Channel Assignment Algorithms for Graphs in the Plane with Graceful Constraints". International Journal of Computer Applications 18(8):35-42, March 2011. Published by Foundation of Computer Science.
- Mahmoud I. Moussa "An Algorithm for Odd Graceful Labeling of the Union of Paths and Cycles" International Journal on Applications of Graph Theory in Wireless Ad Hoc Networks and Sensor Networks (Graph-Hoc), March 2010, Volume 2, Number 1
- Mahmoud I. Moussa & E.M.Badr "On The Derived Subgraphs Conjecture" 1st International Conference on Mathematics and Statistics (ICMS'10) March 2010 Sharjah, UAE.
- Mahmoud I. Moussa & E. M. Badr "Odd Graceful Labeling of Cyclic Snakes" 1st International Conference on Mathematics and Statistics (ICMS'10) March 2010 Sharjah, UAE
- Mahmoud I. Moussa & E. M. Badr "Note on The Derived Subgraphs Conjecture" The Scientific Fourth Saudi Conference, Taibah University March 2010
- Ahmed H. Abu El-Atta and Mahmoud I. Moussa" Visualization for Student-Project Allocation with Preference Over Pairs" In International Conference on Advanced Computer Theory and Engineering (ICACTE2009), September 25 - 27, 2009, Cairo, Egypt, ASME Press, New York, NY (2009).
- Mahmoud I. Moussa "Using Cluster Graph to Reduce the Parallel Cost for Finding the Minimum Spanning Trees" International Conference On Applied Informatics (ICAI'09), November 15- 17, 2009, Centre Universitaire de Bordj Bou Arreridj, Algeria
- Fathy S. El-Kazzaz, Mahmoud I. Moussa, and Waiel F. Abd El-Wahed "Visualization of Genetic Algorithms for Multi-Objective Transportation Problem in Java" In International Conference on Advanced Computer Theory and Engineering (ICACTE 2009), September 25 - 27, 2009, Cairo, Egypt, ASME Press, New York, NY (2009).
- Mahmoud I. Moussa and Ahmed H. Abu El-Atta "Student Project Allocation with Preference Lists Over (Student, Project) Pairs" The 2nd International Conference On Computer And Electrical Engineering (ICCEE 2009), December 28 - 30, 2009 Dubai, UAE.
- Mahmoud I. Moussa & E. M. Badr "Odd Graceful Labeling of Crown Graphs" 1st International Conference Computer Science from Algorithms to Applications December 08-10, 2009 Cairo, Egypt.
- Mahmoud I. Moussa "Some Simple Algorithms for Some Odd Graceful Labeling Graphs" Proceedings of the 9th WSEAS International Conference on Applied Informatics And Communications (AIC '09) August, 2009, Moscow, Russia
- El-Said Badr, Mahmoud I. Moussa, Konstantinos Paparriyos, Nikolaos Samaras, and Angelo Sifaleras "Some Computational Results on MPI Parallel Implementation of Dense Simplex Method" Proceedings of World Academy of Science, Engineering and Technology Volume 17 December 2006, ISSN 1307-6884

#### Languages

- Arabic
- English
- German Basics of German