

# Ahmed M. Khedr Ph.D

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Awarded: State Prize of Distinction in Advanced Technology Egypt 2008,

Sharjah Islamic Bank prize for distinguished research, 2013,

University of Sharjah prize for distinguished research, 2015.

June 14, 2017

## 1 Education

- Ph.D. Doctor of Philosophy in Computer Science and Engineering, March 2003, University of Cincinnati, Engineering College, ECECS Department Cincinnati, USA. Dissertation Title: *Design of distributed Algorithms for Partitioned Databases* .
- M.Sc Computer Science, Cincinnati University, USA, June 1999. thesis Title: *Some Computations in Distributed Networks*.
- M.Sc Mathematical Department, Zagazig University, Egypt Thesis Title: *On Some Optimization Problems* Winter 94.
- B.Sc: Mathematical Department, Zagazig University, Egypt Summer 1989. Rate of appreciation is distinction with Honor Degree.

## 2 Employment:

- Sept. 2010 - till now Associate Professor at Computer Sciences Dept., Faculty of Sciences, Sharjah University, Sharjah, UAE.
- June 2009 - Sept. 2010 Associate Professor at Computer Sciences Dept., Faculty of Computers and Information Systems, Taif University, KSA.

- January 2004 - May 2009 Assistant Professor at Mathematical Department, Faculty of Science, Zagazig University, Egypt.
- March 2003 - January 2004 Research Assistant Professor at ECECS Department, University Of Cincinnati, USA.
- March 1998 - March 2003, Research Assistant at ECECS Department , University of Cincinnati, USA.
- October 1992- March 1998 Teaching Assistant at the Mathematical Department, Zagazig University, Egypt.

### 3 Teaching Experience

I taught the following courses at, Cincinnati, Zagazig, Suez Canal, Taif, and Sharjah Universities for academic years 2000-2016:

Software Engineering, Computer Science I, Computer Science II, C Language, Java Language, Discrete structure, Data Structure, Sequential and Parallel Algorithms, Advanced Design and Analysis of Algorithms, Distributed Systems, Introduction to Computer Networks, Advanced Topics in Networks, Wireless Networks, Networks and Data Security, Automata and Formal Language, Artificial Intelligence, Machine Learning, Pattern Recognition, Programming Languages Concepts, Computer Based Education, Human Computer Interaction, Object oriented Programming, Logic Programming, SPSS Package.

### 4 Teaching Philosophy

My teaching philosophy has developed through my experience as a teaching assistant and assistant professor and associate professor at different Universities. In my experience, the most successful classes are those in which there is a high level of student participation. I will try to encourage classroom participation by carefully organizing each lecture. With clear organization, students are more likely to believe they understand the framework of the class and will therefore be willing to ask questions about sections they do not understand. A second technique that I think will be useful is asking questions of individual students in order to create a more participatory classroom environment.

### 5 Training Competency

I passed the following training competencies:

1. Faculty Development workshop.

2. University systems and regulations for faculties.
3. Fundamentals of Program Assessment (ABT workshop)
4. Train of Trainers (TOT).
5. Use of Technology in Teaching.
6. Students Evaluation Systems.
7. Examination Techniques.
8. International Publishing of Scientific Research.
9. Research Ethics.
10. Legal Aspects in University Environment.
11. University Financial Aspects
12. Managing Time and Meetings.
13. University Code of Ethics.
14. Credit hours System.
15. Conferences Organization.
16. Effective Presentation Skills.

## **6 Statement of Research Interest**

My research interest is in the areas of distributed computing systems, wireless sensor networks and bioinformatics. In these fields a number of techniques and methods are introduced, these techniques are making the demand for robust operation of such systems more stringent than ever.

The emerging networked knowledge environment requires a significant move away from the classical model. In the situations of geographically distributed but networked systems, the data relevant for a computation may exist in a number of different databases residing at different network sites. An efficient system for computations with such distributed data would work by doing as much work at local sites as possible and then communicating minimum required information among the sites. This is much more efficient than transferring the complete databases to a single site, Join these databases, and then execute algorithms with this data. A common constraint in these situations is that the databases cannot be moved to other network

sites due to data-security, size, privacy or data-ownership considerations. Also, for some huge databases it may not be feasible to store and compute with them at one computer site. A number of partitions of this database may be stored at different sites and a set of cooperative algorithms run across the network that produce exactly the same results that would have been obtained if the database were processed at some single site. We present the results of development, validation, implementation and complexity analysis of the decomposable versions of a number of algorithms. The main objective of our algorithms is their self-decomposability for any way in which the graph or the data may be distributed across the sites of a network. Another objective is to perform the tasks by minimizing the number of messages exchanged among the participating sites.

## 7 Publications

1. Ahmed Salim, Walid Osamy and **Ahmed M. Khedr**, Effective Scheduling Strategy in Wireless Multimedia Sensor Networks for Critical Surveillance Applications, submitted to Applied Mathematics & Information Sciences (AMIS).
2. Banafsj Khalifa, Zaher Al Aghbari, **Ahmed M. Khedr**, Jemal Abawajy, Coverage Hole Repair in WSNs Using Cascaded Neighbor Intervention, submitted to IEEE sensors.
3. Dina M. Omar, and **Ahmed M. Khedr**, Effective Routing Protocol with Load Balancing in Wireless Sensor Networks, submitted to Applied Mathematics & Information Sciences (AMIS).
4. Ahmed Salim, Walid Osamy, and **Ahmed M. Khedr**, New Service Discovery Protocol for Mobile Wireless Sensor Networks submitted to Elsevier Ad Hoc journal.
5. Shaza Hanif, **Ahmed M. Khedr**, Zaher Al Aghbari and Dharma P. Agrawal, A Platform for Routing in WSN by Exploiting Internet of Things in Smart Cities, submitted to IEEE,IOT journal.
6. **Ahmed M. Khedr**, and Arwa Attia, New Holes and Boundary Detection Algorithm for Heterogeneous Wireless Sensor Networks, to be appear in IEEE explore.
7. Dina Omar and **Ahmed M. Khedr**, Optimized Clustering Protocol for Wireless Sensor Networks using Compressive Sensing, ICCMIT16, Cosenza, Italy, April 25-29, 2016.
8. **Ahmed M. Khedr**, Location-Free Minimum Boundary Coverage in a Wireless Sensor Network, Procedia Computer Science Vol. 65, pp. 48-57, 2015.

9. **Ahmed M. Khedr**, Effective Data Acquisition Protocol for Multi-hop Heterogeneous Wireless Sensor Networks Using Compressive Sensing, *Algorithms*, Vol. 8, No. 4, pp. 910-928; doi:10.3390/a8040910, 2105.
10. **Ahmed M. Khedr**, Decomposable Algorithm for Computing k-Nearest Neighbors across Partitioned Data, accepted in: *International Journal of Parallel, Emergent and Distributed Systems*, DOI:10.1080/17445760.2015.1057820, 2015.
11. **Ahmed M. Khedr** New Localization Technique for Mobile Wireless Sensor Networks using Sectorized Antenna, submitted to the *International Journal of Computer Networks & Communications (IJCNC)*, Vol. 8, No. 9, pp. 329-341, 2015.
12. **Ahmed M. Khedr** and Dina M. Omar, ERPLBC-CS: Energy Efficient Routing Protocol for Load Balanced Clustering in Wireless Sensor Networks, accepted in *Wireless Sensor Networks, Ad Hoc & Sensor Wireless Networks journal*, 2016.
13. **Ahmed M. Khedr** and Raj Bhatnagar, New Algorithm for Clustering Distributed Data using k-means, *Computing and Informatics*, Vol. 33, pp. 1001-1022, 2014.
14. Ahmed Salim, Walid Osamy, and **Ahmed M. Khedr**, IBLEACH: Effective LEACH Protocol for Wireless Sensor Networks, to appear in *Wireless networks, Wireless Networks*, Vol. 20, pp. 1515-1525, 2014.
15. Ahmed M. Khedr and Dina M. Omar, SEP-CS: Effective Routing Protocol for Heterogeneous Wireless Sensor Networks, to appear in *Ad Hoc & Sensor Wireless Networks*, Vol. 26, pp. 211-232, 2015.
16. **Ahmed M. Khedr** and Ibrahim Atia, Decomposable Naive Bayes Classifier for Vertically Distributed Data using Directed Acyclic Graph, ISBN: 978-0-9891305-4-7 2014 SDIWC TAECE2014, pp. 38-49, 2014.
17. Enas Salem, **Ahmed M. Khedr**, and Hamed Nasser, M-Pegasis: Energy Efficient Pegasis for Mobile Wireless Sensor Networks, *Egyptian Computer Science Journal*, Vol. 37, No. 6, pp.33-43, Sept. 2013.
18. Wallaa EL-Salhy, **Ahmed M. Khedr**, and Fayed F. M. Ghaleb, EARPB: Enhanced Approach with a Random Perturbation-Based Scheme, for establishing Authentic Associations in Wireless Mesh Network, *Mathematical Applications in Science and Mechanics*, Dubrovnik, Croatia, pp103-108, June 25-27, 2013

19. Dina Omar, **Ahmed M. Khedr** and Hamed Nassar, HCBHRP-CS: Effective Routing Protocol for Multi-level Heterogeneous Wireless Sensor Networks, Egyptian Computer Science Journal, Vol. 37, No. 4, May 2013.
20. Lamiaa Elsayed, **Ahmed M. Khedr**, and Ismail Amr, TOADV: TOA-based advanced DV-hop Localization Algorithm for Wireless Sensor Networks, Egyptian Computer Science Journal, Vol. 38, No. 1, pp. 59-70, 2014.
21. **Ahmed M. Khedr** and Walid Osamy, Minimum Connected Cover of Query Regions in Heterogeneous Wireless Sensor Networks, Information Sciences, Vol. 223, pp. 153-163, 2013.
22. **Ahmed M. Khedr**, Decomposable Naive Bayes Classifier for Partitioned Data, Computing and Informatics, Vol. 31, pp. 1511-1531, 2012.
23. **Ahmed M. Khedr** and Mohamed Hamzah Ibrahim, Log-odd: A New Method for Improving Hidden Markov Model Decoding for Gene Finding, Kuwait J. Sci. 39 (2A), pp. 103-118, 2012.
24. **Ahmed M. Khedr** and Rania Mahmoud, Agents for Integrating Distributed Data for Function Computations, Computing and Informatics, Vol. 31, pp. 1101-1125, 2012.
25. **Ahmed M. Khedr**, Walid Osamy, Mobility-assisted minimum connected cover in a wireless sensor network, J. Parallel Distrib. Comput. Vol. 72, pp. 827-837, 2012.
26. **Ahmed M. Khedr**, Ibrahim Attia, Classification of Vertically Distributed Data using Directed Acyclic Graph, ICGST Conference on Computer Science and Engineering, Istanbul, Turkey, pp. 207-215, 19-21 December 2011.
27. **Ahmed M. Khedr**, Nearest Neighbor Clustering over Partitioned Data, Computing and Informatics, Vol. 30, pp. 1001-1026, 2011.
28. **Ahmed M. Khedr**, Improving Protein Tertiary Structure Prediction using HMM, Kuwait J. of Sci. and Eng. Vol. 38, No. 2A, pp.1-14, 2011.
29. **Ahmed M. Khedr** and Walid Osamy, Effective Target Tracking Mechanism in a Self-Organizing Wireless Sensor Network, Journal of Parallel and Distributed Computing, Vol. 71, pp. 1318-1326, 2011.
30. **Ahmed M. Khedr** and Walid Osamy, Minimum perimeter coverage of query regions in heterogeneous wireless sensor networks, Information Sciences, Vol. 181, pp. 3130-3142, 2011.

31. **Ahmed M. Khedr** and Hagar Ramdan, Effective Sensor Relocation Technique in Mobile Sensor Networks, International Journal of Computer Networks & Communications (IJCNC), Vol. 3, No.1, pp. 204-217, January 2011.
32. **Ahmed M. Khedr** and Walid Osamy, Finding Perimeter Of Query Regions In Heterogeneous Wireless Sensor Networks, Computing and Informatics, Vol. 29, No. 4, pp.1001-1021, 2010.
33. **Ahmed M. Khedr** and Walid Osamy, Nonlinear Trajectory Discovery of a Moving Target by a Wireless Sensor Network, Journal of Computing and Informatics, Vol. 29, No. 5, pp. 1001-1016, 2010.
34. Walid Osamy and **Ahmed M. Khedr**, Identifying coverage perimeter of heterogeneous wireless sensor networks, Info Comp. Journal, Vol. 8, No. 2, 2009.
35. **Ahmed M. Khedr**, Walid Osamy, and Dhrama P. Agrawal, Perimeter Discovery in Wireless Sensor Networks, J. Parallel Distrib. Comput., Vol. 69, pp. 922-929, 2009.
36. **Ahmed M. Khedr** and Ahmed Salim, Decomposable Algorithms for Finding the Nearest Pair, J. Parallel Distrib. Comput., Vol. 68, pp. 902-912, 2008.
37. **Ahmed M. Khedr**, Learning  $k$ -Classifier from Distributed Databases, Computing and Informatics Journal, Vol. 27, pp. 355-376, 2008.
38. **Ahmed M. Khedr**, New Mechanism for Tracking a Mobile Target using Grid Sensor Networks, Computing and Informatics, Vol. 28, pp.1001-1021, 2008.
39. **Ahmed M. Khedr** and Walid Osamy, Tracking Mobile Targets Using Random Sensor Networks, The Arabian Journal for Science and Engineering, Vol. 32, No. 2B, pp. 301-315, October 2007.
40. **Ahmed M. Khedr** and Raj Bhatnagar, Agents for Integrating Distributed Data for Complex Computations, Computing and Informatics Journal , Vol. 26, No. 2, pp. 149-170, 2007.
41. Mohamed M. Gadallah, **Ahmed M. Khedr**, and Rania Mahmoud, Permeability Calculation from Well Logs Using New Learning Techniques, J. Appl. Geophys., Vol. 6, No. 2, pp. 113-119, 2007.
42. Mohamed H. ElSayed and **Ahmed M. Khedr**, Improving an HMM Performance for Protein Family, Applied Sciences Journal, Vol. 7(12), pp. 1626-1632, 2007.
43. **Ahmed M. Khedr** and Walid Osamy, A Topology Discovery Algorithm for Sensor Network Using Smart Antennas, Computer Communications Journal, Vol. 29, pp. 2261-2268, 2006.
44. **Ahmed M. Khedr** and Ahmed Salim, Decomposable Algorithms for Finding the nearest Point in Distributed Data, Assiut Journal of Sciences, Vol. 2, pp. 60-76, 2006.

45. **Ahmed M. Khedr** and Raj Bhatnagar, Agents for Integrating distributed databases for Complex Computations, Turk. J. Elec. Eng. & Comp. Sci., 14, pp. 313-327, 2006.
46. **Ahmed M. Khedr**, Tracking Mobile Targets using Grid sensor networks, GESJ: Computer science and Telecommunications, Vol. 3(10), pp. 66-84, 2006.
47. **Ahmed M. Khedr** and Raj Bhatnagar, A Decomposable Algorithm for Minimum Spanning Tree, Distributed Computing-Lecture Notes in Computer Science Springer-Verlag Hmidmlferg, Vol. 29, 181, pp. 33-44, 2004.
48. **Ahmed M. Khedr** and Raj Bhatnagar, Graph Algorithms to Process Data Across wide-Area Networks, MDM2003, pp. 17-27, 2003.
49. **Ahmed M. Khedr** and Raj Bhatnagar, A Decomposable Algorithm for Path Finding Problem, MAICS/2003, pp. 77-63, 2003.
50. **Ahmed M. Khedr** and M. Z. Ragab, Third order Optimization Problem, Far East Journal, Math. Sci. India , Vol. 1, No. 2, pp. 1-20, 1993.
51. **Ahmed M. Khedr** and M. Z. Ragab, An Optimization Problem, Bull. Of the fac. of Sciences, Zagazig University, Vol. 15 (1), pp. 421-444, 1993.
52. **Ahmed M. Khedr** and Hagar Ramdan, Effective Data Routing in Disjoint Clusters of Mobile Wireless Sensor Networks using Mobile Sinks, submitted to Ad hoc & wireless sensor networks journal.
53. **Ahmed M. Khedr**, Zaher AL Aghbari, and Ibrahim Kamel, Decomposable Algorithm for Mining Association Rules on Distributed Data, submitted to IAJIT.
54. **Ahmed M. Khedr**, Speeding up Gene Classification using Generalized Hidden Markov Model, submitted Journal of applied Science.
55. **Ahmed M. Khedr**, LPB: A New Decoding Algorithm for Improving the performance of an HMM in gene finding applications, submitted to Information Sciences.

## 8 Graduate Students

### Current Students:

- Jomana Nimrat, An Efficient Data Routing Protocol for Wireless Body Area Network.
- Ammara Razzaq, Face-based Fault Tolerant Mobile Object Tracking in Wireless sensor Networks.



- Arowa Attia, Dissertation title "New Techniques of Optimal Coverage and Localization for Heterogeneous Wireless Sensor Networks.
- Walaa ElSalahy, Thesis title " New Techniques for wireless Security".

#### Past Students:

- Ibrahim Atia, Thesis title "Agents for integrating Distributed Databases".
- Hagar Ramdan, Thesis title "Coverage and Energy Efficient of Mobile Wireless Sensor Network".
- Aroa Atia, Thesis title "Holes and Boundary Discovery for Sensor Networks".
- Walid Osamy, Dissertation title "New Techniques for Finding Perimeter and Minimum Coverage in Distributed Sensor Networks".
- Rania Mahmoud, Thesis title "Agents for Integrating Data through the Networks".
- Mohamed Hamza, Thesis title "Some Pattern Recognition Techniques for Biological Data Sequence Analysis".
- Ahmed Salim, Thesis title "On some Mathematical Computation on Distributed Networks".
- Walid Osamy, Thesis title "Topology finding in heterogenous Wireless Sensor Networks".

## 9 Projects

- Distributed Path tracking and computation using a wireless sensor Network with smart Antina 2016 (200,000 AED).
- Acquisition of a Research Network for Distributed Computing,
- Advanced Algorithms for Spatial-Temporal Interactions in Distributed GIS,
- Using Smart Antenna with Random Sensor Networks.

## 10 Professional Society Membership

- Springer
- IEEE Society.
- ACM Society.

- Egyptian Science Syndicate.
- Egyptian Mathematical Society.
- ANSI Group.
- Elsevier.

## 11 Awards

- University of Sharjah prize for distinguished research, 2015.
- Sharjah Islamic Bank prize for distinguished research, 2013.
- State Prize of Distinction in Advanced Technology Awarded by *the the Egyptian Academy of Sciences and Technology* (2008), Egypt.
- ParOwn Project 2006-2007 (\$15,000).
- Summer Research Fellowship, University of Cincinnati 2001-2002.
- Summer Research Fellowship, University of Cincinnati 2000-2001.
- Summer Research Fellowship University of Cincinnati 1999-2000.
- UGS University of Cincinnati 1999-2003.
- Egyptian Government Scholarship 1998.
- Academic outstanding award, Zagazig University 1990.