

Marwan Saeed Abualrub, Ph.D.



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EDUCATION

Ph.D. (*Excellent; GPA: 4.80 out of 5*)

Thesis Title: Non-linear Partial Differential Equations Applied to Diffusion Problems Arising in Mathematical Biology.

Major: Applied Mathematics (Mathematical Biology, Mathematical Modeling, and D.E.s)

Minor: Pure Mathematics (Functional Analysis)

University of Illinois at Chicago (UIC), USA, 1992.

M.Sc. (*Excellent; GPA: 4.78 out of 5*)

Major: Applied Mathematics.

University of Illinois at Chicago (UIC), USA, 1989.

B.Sc. (*Very good*)

Major: Mathematics

Minor: Statistics

Yarmouk University, Jordan, 1987.

BIRTH DATE

May, 9, 1965

**PROFESSIONAL
EXPERIENCE**

August 2013- Present

*Preparatory Program (Mathematics)
Khalifa University
Abu Dhabi, UAE*

September 2011- June 2013

*Department of Mathematics
PMU
Saudi Arabia*

September 2007- September 2011

*Department of Mathematics
The University of Jordan (JU)
Amman 11942
JORDAN*

August 1999- June 2007

*Department of Natural and Quantitative Sciences
P.O.Box 19282
Zayed University (ZU)
Dubai, United Arab Emirates*

September 1993- July 1999

*Department of Mathematics
University of Qatar (QU)
Doha, Qatar
(Appointed as Assistant Professor in 1993 then Associate Professor in 1998)*

September 1992- June 1993

*Instructor at the Mathematics and Computer Science Unit
Basic University Education Center
United Arab Emirates University (UAEU)
Al-Ain, United Arab Emirates*

September 1987- August 1992

*Lecturer of Mathematics
University of Illinois at Chicago (UIC)
Chicago, Illinois
USA*

September 1986 - June 1987

*Teacher of Mathematics in a High School
Ministry of Education
Jordan*

**ADMINISTRATIVE
EXPERIENCE**

- 1- *At UIC, when I was a graduate student and a lecturer at the same time, I was doing the orientation for new Lecturers and Teaching assistants who join the Department of Mathematics, Statistics, and Computer science. (1988-1992)*
- 2- *Math teachers' Supervisor in the Professional Development Program and the Bridge programs at UIC under the leadership of Prof. John Baldwin. (1989-1991)*
- 3- *I (together with some colleagues) was in charge of making up the faculty-teaching schedule every semester in the math department at QU. (1993-1999)*
- 4- *I was assisting the Math Department Head at QU for the last 3 years of my service there; therefore I got experience in running most of the departmental issues. (1996-1999)*
- 5- *At ZU, I was the Math group Chair at Dubai campus; in addition to working as a coordinator of some math courses. (2000-2006)*

TECHNOLOGY

Experience in using Technology in Teaching such as Power Point Presentations, Mathematical Soft wares, Mathematical Internet websites, Blackboard...etc. Also, a good experience in website's design.

AWARDS

- 1- Certificate of Excellence, Zayed University, 2000.
- 2- Appreciation Certificate, Qatar University, 1999.
- 3- Appreciation Certificate, College of Engineering, UIC, 1992.
- 4- Chosen as Outstanding Young Man of America for 1989.
- 5- Chosen as the best Instructor at UIC, 1987-1992.
- 6- Honors List at Yarmouk University, 1986.

PH.D. THESIS SUPERVISION *The Advisor of a Ph.D. student “Manar Al-Qudah”. The title of her Thesis is “Stability of Solutions for some non-linear partial differential equations” 2008-2010.*

GRADUATE QUALIFYING EXAMS *I wrote and graded the Ph.D. qualifying and the M.Sc. comprehensive exams in Applied Mathematics.*

M.SC. THESIS SUPERVISION *The Advisor of a M.Sc. Student “Omar Abu Ghalioun”. The title of his Thesis was “Traveling Wave Solutions for a non-linear diffusive partial differential equation” 2008-2009.*

PH.D. TEACHING *I am teaching Ph.D. Mathematics and Physics students at the University of Jordan.*

PH.D. and M.SC. THESES COMMITTEES

Participated in many Ph.D. and M.Sc. Theses Defense Examination Committees at the University of Jordan.

CONFERENCES

1-Participated in the American Mathematical Society Annual Conference that held in January 1992; Baltimore, Maryland, USA.

2-Participated in all Conferences that held in QU.

3-Participated in the Conference of Mathematical analysis and applications, which held on May 2-4 ,2001 at the American University of Sharjah, UAE.

4- Participated in the Gulf research center forum, which held on March 9 and 10, 2004, The First Annual Forum on 'Social Sciences and Humanities in the Gulf' focusing on ' Future Prospects for Higher Education in the GCC Countries. Dubai, UAE.

5-Participated in the Math day, which held on April 1, 2004 at the American University of Sharjah, UAE. At that day, I gave a talk entitled "A solution to a non-linear partial differential equation (PDE) of Parabolic type"

6- Participated in most of the Conferences held in the UAE and in some regional conferences.

SEMINARS I gave some Seminars at all of the above Universities I worked at.

COMMITTEES

- 1- Faculty Affairs Committee at QU.
- 2- Mathematics Department Hiring Committee at QU & ZU.
- 3- Advising Committee at QU.
- 4- Registration Committee at QU.
- 5- Student Activities Committee at QU.
- 6- Teaching Schedule Committee at QU & ZU.
- 7- Course Equivalence Committee at QU.
- 8- Continuous Education Committee at QU.
- 9- Course plan committee at QU.
- 10- Faculty of Science Development and Planning Committee at JU.
- 11- In Charge of the Math. Department website at JU.
- 12- Ph.D. and Master's degree examination committee in the math department at JU.
- 13- Faculty of Science Graduate Studies Committee at JU.
- 14- Faculty of Science Representative in the University Council at JU.
- 15- Member of other math department committees at JU including Scientific Research Committee.
- 16- Chair of teaching coordination Committee at PMU.
- 17- Hiring Committee at PMU.
- 18- Research and conference Committee at PMU.
- 19- Website development Committee at PMU.

PROFESSIONAL ORGANIZATIONS

Member, American Math. Society.

Member, Society for Math. Biology.

SOME SERVICES OUTSIDE JU:

1- Selected by JU to serve as an Expert in judging some disputes related to some Ministry of Education Math Books.

2- Served as a Referee in evaluating some international Math graduate programs in applied mathematics.

3- Served as a Referee in evaluating some promotions to the rank of associate professorship outside JU.

PAST RESEARCH INTEREST

Mathematical Biology & Mathematical Modeling.

PRESENT RESEARCH INTEREST

Mathematical Biology & Mathematical Modeling.

FUTURE RESEARCH INTEREST

Mathematical Biomedicine & Mathematical Biology.

BOOKS

Participated in writing one chapter in a book about History of Mathematics together with my Advisor Professor Calixto Calderon. The Article I wrote was Ibn Rushd "Aver roes" and medicine.

PUBLICATION SUMMARY

The main topic of the papers is Mathematical Biology, especially diffusion and Epidemics. In this area we have developed or modified some models and we Have shown the existence and uniqueness to some of them in $L(p,q)$ spaces Using Applied Functional Analysis while in other models we have found either Exact solutions or travelling wave solutions. The main contributions were the Introduction of interaction among the same kind of species in the population, including population pressure in some models, modeling long range diffusion, And others.

JOURNAL EDITORSHIP and REFEREEING

- One of the Editors for these two International Journals of Applied Mathematics in the USA and UK; namely:

<http://castle.eiu.edu/~iasc/ijasc/board.htm>

AND

<http://www.cekinfo.org.uk/EIJST-Editorial-Board>

- Referee and Reviewer of some well-reputed international applied mathematics journals...such as:

1- *Journal of Computational and Applied Mathematics / USA.*

2- *Computers and Mathematics with Applications / USA.*

3- *Other ELSEVIER'S MATHEMATICS JOURNALS.*

OVERSEAS CURRENT RESEARCH

Currently, I together with a US research group led by Prof. Seth Frisbie, a Chemist from Norwich University-Vermont-USA, we are conducting a vital research for which I am in charge of the

mathematical and statistical calculations for that research; as I did earlier in computer science research for which I was in charge of all the required mathematical calculations, see papers # 4 & # 6 below. The research we are conducting currently with Prof. Seth Frisbie and his group is basically to calculate the lowest reportable concentrations of toxic chemicals in the environment, see the in preparation paper # 10 below .

For more details, you may contact Prof. Seth Frisbie at any of the following e-mails:

shfrisbie@norwich.edu OR frizzles@intergate.com OR shf3@cornell.edu

COURSES TAUGHT

MATH 901:*Advanced Topics in Applied Mathematics for Ph.D. students,*
MATH 903:*Advanced Partial Differential Equations with Applications for Math and Physics Ph.D. Students, Basic Mathematics, College Algebra, Precalculus, Trigonometry, Calculus 1, Calculus 2, Calculus 3, Calculus 1 for Engineering students, Calculus 2 for Engineering students, Mathematics for finance, Business Calculus, Mathematics for Business, Business Statistics, Statistics 1, Statistics & Probability, Mathematical Statistics, Vector Calculus, Advanced Calculus, Business Calculus, Ordinary Differential Equations 1, Differential Equations 2 and modeling, Differential Equations for Engineering students, Applied Mathematics for Engineering students, Advanced Engineering Mathematics I & II, Partial Differential Equations I & II, Complex Variables, Mathematics for Biology 1 & II, Real Analysis 1&2, Advanced mathematical methods, Special Course in Modeling, Graduation Research Projects in Partial Differential Equations and in Mathematical Biology (AIDS Modeling). Information Technology 1, Information Technology 2, Information Technology 3.*

LIST OF PUBLICATIONS:

1- Abualrub, M.S.: Diffusion Problems Arising in Mathematical Biology I. Dirasat, Natural and Engineering Sciences Journal, University of Jordan, Vol.23, No.1, pp.106-115, 1996.

2- Abualrub, M.S.: Diffusion Problems Arising in Mathematical Biology II. Qatar University Science Journal, Vol.16, No. 1, pp.23-29, 1996.

3- Abualrub, M.S.: Another look at the Nerve Action Conduction Problem. Bulletin of the Faculty of Science, South Valley University, Vol.1, No.1, pp.54-65, 1996.

4- Abualrub, M.S. and El-Sherbiny, H.M.: A solitary wave solution to an Insect Dispersal Model . Bulletin of the Faculty of Science, South Valley University, Vol.1, No.1, pp.67-78, 1996.

5- Abualrub, M.S.: An Analysis to the Wavefront Solutions of the Modified Plankton-Herbivore Model. Journal of the Institute of Math and Computer Science , Vol.7, No.2, pp.63-66, 1996.

6- Abualrub, M.S.: An Exact Travelling Wave Solution to an Insect Dispersal Model. Journal of the Institute of Math and Computer Science , Vol.8, No.1, pp.23-25, 1997.

7- Abualrub, M.S.: *An Analysis to the Traveling Wave Solution of a diffusive Model of an Epidemic.* Tamkang Journal of Mathematics, Vol. 29, No.1, pp.65-68, 1998.

<http://www.math.tku.edu.tw/english/journal/index.htm>

Abstract: *An SIR model of an epidemic with spatial spread is considered; an equilibrium and stability analysis has been done, and then the behavior to the traveling wave solution of the model is obtained.*

8- Abualrub, M.S.: *Long range diffusion-reaction model on population dynamics.* Documenta Mathematica (J. of German Mathematician Union). Vol. 3, pp.331-340, 1998.

(The paper has been published , by the Journal, in the Internet)

To view the paper or get a reprint from the Internet, just click on:

<http://www.math.uiuc.edu/documenta/vol-03/vol-03-eng.html>

Abstract: *A model for long range diffusion-reaction on population dynamics has been created, then conditions for the existence and uniqueness of solutions of the model have been found in $L(p,q)$ norms.*

9- Abualrub, M.S.: *Vaccination in a model of an epidemic.*

The International Journal of Mathematics and Mathematical Sciences (IJMMS), Vol.23, No.6, pp.425-429, 2000.

(The paper has been published , by the Journal, in the Internet)

To view the paper or get a reprint from the Internet, just click on:

<http://www.hindawi.com/GetArticle.aspx?doi=10.1155/S0161171200002696>

Abstract: *A model, which describes an epidemic, has been considered. The logistic growth and vaccination have been included in the model. An equilibrium and stability analysis has been done to the model. Then a spatial Spread has been added to the model and a traveling wave solution has been obtained.*

10- Abualrub, M.S., Kanaan, Al-Shalabi, and Rawashdeh:

Relevance Feedback: Experimenting with a Simple Arabic Information Retrieval System with Evaluation.

Accepted for publication in the International Journal of Applied science and computations, 2004.

<http://www.eiu.edu/~ijasc/index.html>

Abstract: *Information retrieval is one of the most active research areas nowadays, motivated by the need for an effective system that can satisfy the user information needs. In the heart of an information retrieval system is the ranking algorithm that orders the answer set according to a similarity measure hoping to achieve satisfactory results. Unfortunately, a powerful system is needed to achieve a satisfactory answer set for the user. Here **relevance feedback** strategies can aid in enhancing the results. These strategies have been tested thoroughly on English text and proved effective. In this work we implement a simple system that enables us to deal with Arabic text and we examine some of the common relevance feedback strategies that have been shown to be effective in other languages.*

11- Abualrub, M.S.: *Ibn Rushd "Averroes" and Medicine.*

IBN RUSHD FORUM for freedom of thought Journal. 6th issue, 2004.

The article is published in the following website:

<http://www.ibn-rushd.org/forum/Abualrub.html>

Abstract: Ibn Rushd was well known in the fields of astronomy, philosophy, mathematics, etc. This article sheds the light on one of his contributions to medicine.

12- Abualrub, M.S.: A solution to a non-linear partial differential equation (PDE) of parabolic type. *International Journal of Applied sciences and computations*, Vol.12, No.3, pp.148-151, Dec., 2005.

13- Abualrub, M.S., Kanaan, Al-Shalabi, Nahar, and Al-modallal: N-Gram: a Method of Conflating Terms:

An Approach to text Categorization and Question Answering Systems in the Arabic language

International Journal of Applied science and computations, Vol.12, No.2, pp.113-127, 2005.

<http://www.eiu.edu/~ijasc/index.html>

Abstract: Our main application program walks through the implementation of the N-Gram technique for Question Answering Systems. The goal of this program is to try to find a paragraph in an Arabic document that can serve as an answer to a question. The implementation uses the Prolog Language. The overall idea is coupling an information retrieval system with a shallow approach to natural language processing. The essential first step in accomplishing this task is the categorization of texts. We mean that for search purposes the search must be guided toward only the related categories: say science, medicine, social problems? Society? history, and other vital categories. Our paper proceeds to attack this vital step, which must be handled as a separate task. We know that this task is already completed in a typical English corpus, such as, for example, the TREC-8 context. We describe the categorization of documents in detail and we also give an overview of advanced topics in this domain... The user asks a question in unstructured language but with a careful choice of words, since document categorization is based on word occurrence information. To process the user's question we use mainly the N-gram, but to enhance the process for high occurrences success we remove some known suffixes, numbers, English words, and others, which are called Stop-Words. This process of removing words is called normalization. For simplicity we assumed that the collection of targeted documents is identified ahead of time r and stored as a text file. The rest of the words forming the question are farther processed by the body of our program, which uses N-Grams to compute the similarity between a word and other words from a paragraph of a selected document. Based on the similarity results, we may assign a value. Depending on the values for each word, a selected paragraph may be returned as an answer.

14- Abualrub, M.S.: Existence and Uniqueness of solutions to a long range diffusive predator-prey

Model.

International Mathematical Forum (IMF) Journal, Vol.4 , No.40 , pp.1981-1991, 2009

The article is published in the following website:

<http://www.m-hikari.com/imf-password2009/37-40-2009/abualrubIMF37-40-2009-1.pdf>

Abstract: A model for predator-prey has been considered, existence and uniqueness to long range diffusion of such model has been shown.

15- Abualrub, M.S. : A Formula for solving a special case of Euler-Cauchy ODE.

International Mathematical Forum (IMF) Journal, Vol.4 , No.40 , pp.1997-2000, 2009

The article is published in the following website:

<http://www.m-hikari.com/imf-password2009/37-40-2009/abualrubIMF37-40-2009-3.pdf>

Abstract: A quick and simple formula has been introduced to solve a special case of non-linear n th Order Euler-Cauchy ODE.

16- Abualrub, M.S. & Sulaiman, W.T.: A Note on Holder's Inequality. *International Mathematical Forum (IMF) Journal*, Vol.4 , No.40 , pp.1993-1995, 2009

The article is published in the following website:

<http://www.m-hikari.com/imf-password2009/37-40-2009/abualrubIMF37-40-2009-2.pdf>

Abstract: In this Note an easy method has been introduced to prove Holder's Inequality.

17- Abualrub, M.S. & Qudah M.A.: Existence of solutions to a model of long range diffusion involving flux. *Journal of Applied Functional Analysis (JAFA)*, Vol.5, No.4, pp.370-376, **2010**.

Abstract: A model for insect dispersal has been considered, existence and uniqueness of solutions to the long range diffusion involving flux for such model has been shown in $L(p,q)$ spaces.

NOTE: # 18 below is an ongoing big research project ; it is mentioned here just for your information (FYI):

18- Abualrub, M.S., Frisbie, S.H., Mitchell, E.J., and Sarkar, B. : Calculating the lowest reportable concentrations of toxic chemicals in the environment. (In preparation)

Abstract:

Method detection limit (MDL) is perhaps the most important statistic used for the reporting of toxic chemicals in air, drinking water, wastewater, food, hazardous wastes, and other environmental samples. A toxic chemical measured at a concentration that is less than its MDL is reported as "not detected" and is generally considered to be absent from the sample and the environment. In contrast, a toxic chemical measured at a concentration that is greater than or equal to its MDL is reported at its measured concentration. Furthermore, many chemicals are so toxic that they cannot be measured to safe levels and the allowable limits must be set at the lowest reportable concentrations. We will demonstrate that the equation promulgated by 40 Code of Federal Regulations (CFR) to calculate MDL and used since 1981 to protect public health and the environment is incorrect. As a result, toxic chemicals in a large number of environmental samples may in fact be present at measurable concentrations even though they are currently being reported as "not detected". In addition, the allowable limits for some extremely toxic chemicals may be incorrectly set too high. Therefore, the consequences of this error pose a risk to public health and the environment. The sources of this error will be explained and an improved equation is presented.

19- Abualrub, M.S. & Abu Ghalyoun, O.: Traveling wave solution for a non-linear diffusive partial differential equation. *Journal of Applied Functional Analysis (JAFA)*, Vol.6, No.4, pp. 308-313, **2011**.

20- Abualrub, M.S. & Qudah M.A.: Solitary and traveling wave solutions to a model of long range diffusion involving flux with stability analysis. *International Mathematical Forum (IMF) Journal*, Vol. 6, No. 27, pp. 1313 – 1318, **2011**.

<http://www.m-hikari.com/imf-2011/25-28-2011/alqudahIMF25-28-2011.pdf>

***** NOTE:** *Other Papers already submitted for possible publication...In press.*

REFERENCES

1- Dr. Seth Frisbie / Norwich University / USA

E-mail: sfrisbie@norwich.edu

2- Professor Dr. Jeffrey Hill / University of New Mexico / USA

E-mail: jeffrey12357@hotmail.com

3- Professor Dr. Evans Afenya / Elmhurst College / USA

E-mail: evansa@elmhurst.edu