

Mohammed El-Beltagy

Date of Birth :	9th April 1973	Address:	2491 Sawmill Rd.
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EDUCATION

Sept. 1996-Feb. 2000 Ph.D. Mechanical Engineering
University of Southampton

Investigating the use of natural computation for multilevel-optimisation (MLO). In MLO there exists several models of the physical object being optimised, these models are trade-offs between computational expense and accuracy. The goal of the research was to glean ideas from nature and apply them in order to interleave the various models in sensible fashion.

The Ph.D. was jointly sponsored by the Engineering and Physical Science research council (EPSRC) and British Aerospace plc.

Oct. 1995-Sept 1996 MSc. Mechatronics
Lancaster University

Investigating the non-linear dynamics of a wave energy conversion device (PS Frog).

Sept. 1989-Jun. 1994 BSc. Mechanical Engineering
The American University in Cairo

Grade Point Average: 3.754 / 4 (magna cum laude)

Graduation Project:

Conducting an environmental audit of the automotive industry in Egypt with emphasis on the feasibility of implementing pollution prevention methodologies whenever possible.

HONOURS AND AWARDS

May 1994 Received an academic honour in recognition for outstanding achievement as a Senior.

May 1993 Received an academic honour in recognition for outstanding achievement as a Senior.

May 1992 Received an academic honour in recognition for outstanding achievement as a junior.

WORK EXPERIENCE

May 200 -

Senior Scientist at BIOS group Inc.

Was responsible for various algorithmic development efforts, key of which were:

1. Developing a patented high dimensional trade-matching engine for finding optimal trades between parties. This work involved constructing a robust and fast non-linear optimisation algorithm that made use of constraint logic programming concepts.
2. Developing a highly granular energy network capacity allocation algorithms for pipeline scheduling that is a synthesis between traditional networks flow approaches and advance AI techniques.
3. Developing agent algorithms for adaptive/collaborative supply chain webs.

Sep. 1996-Oct. 1999

Various responsibilities: During my PhD. I undertook the following tasks:

1. **Training:** I was responsible for training BAe personal on the use of the MLO methods developed by myself.
2. **Project Planning:** I was involved in the project planning activities for three research bids to the EPSRC and various industrial bodies. Two of these bids were won.
3. **Marketing and technical presentation:** Gave numerous presentations at BAe for a technical as well as none a technical audience. These presentations were to report on progress, as well as to elicit the importance of Southampton's work for the organisation.
4. **Teaching:** I was a teaching assistant for several undergraduate courses in the Mechanical Engineering department.

Jan. 1995 -Sep. 1995

Managing Director (Advanced Computer Systems Division) at **BELCO (Egyptian Co. for international trade)**. Was responsible for sales, marketing, and technical support for three major software companies for which BELCO was a dealer. The companies were ALGOR^{INC}, Primavera Systems^{INC}, and Applied Flow Technology Corp.

Jul. 1994 -Dec. 1994

Systems Analyst at Procter & Gamble Egypt

Responsibilities included redesign of the reporting system for the finance, distribution, and marketing departments and the maintenance and upkeep of the integrity of the database system.

RESEARCH INTERESTS

The synthesis between evolutionary search methods and artificial neural nets for conducting search on computationally expensive design problems.

Applying Bayesian belief networks to time series prediction of financial data.

Visualisation of large design spaces for supervised optimization.

Structural design optimization incorporating HOX like gene representation for making large morphological changes.

PUBLICATIONS

M. A. El-Beltagy and A. J. Keane, "Optimisation for Multilevel Problems: A Comparison of Various Algorithms," pp. 111-120 in Proceedings of the Conference on Adaptive Computing in Design and Manufacture 98, ed. I. C. Parmee, Springer Verlag, ISBN 3-540-76254-X, Plymouth (1998).

G. M. Robinson, M. A. El-Beltagy, and A. J. Keane, "Optimization in Mechanical Design," pp. 147-165 in Evolutionary Design by Computers, ed. P. J. Bentley, Academic Press (1999).

M. A. El-Beltagy and A. J. Keane, "A Comparison of Genetic Algorithms with Various Optimization Methods for Multi-level Problems," Eng. Appl. of Artificial Intelligence, , Vol. 12, pp. 639-654, (1999).

M. A. El-Beltagy and A. J. Keane, "Using Self Organizing Maps and Genetic Algorithms for Model Selection in Multilevel Optimization," The Twelfth International Conference on Industrial & Engineering Applications of Artificial Intelligence & Expert Systems IEA/AIE-99, Cairo, Egypt, May 31- June 3, (1999).

M. A. El-Beltagy, P. B. Nair, and A. J. Keane, "Metamodeling Techniques For Evolutionary Optimization of Computationally Expensive Problems: Promises and Limitations," pp. 196-203 in Proceedings of the Genetic and Evolutionary Computation Conference, Vol. 1, Banzhaf, W., Daida, J., Eiben, A. E., Garzon, M. H., Honavar, V., Jakiela, M. and Smith, R. E. (Eds). Morgan Kaufmann, San Francisco, California (1999).

M. A. El-Beltagy and A. J. Keane, "Topographical mapping assisted Evolutionary Search for Multilevel Optimization," pp. 660-665 in Proceedings of the 1999 Congress on Evolutionary Computation, Vol. 1, IEEE Press, Piscataway,NJ, (1999).

M. A. El-Beltagy and A. J. Keane, "Evolutionary optimization for computationally expensive problems using Gaussian Processes," pp. 708-714 in Proceedings of the International Conference on Artificial Intelligence (IC-AI'2001), Vol II, Hamid Arabia (Ed), CSREA Press, Las Vegas, Nevada (2001).

Mohammed A. El-Beltagy and W. Andy Wright, "Gaussian Processes for Model Fusion," pp. 373-380 in Proceeding of the International Conference on Artificial Neural Networks ICANN-2001, Springer-Verlag, Berlin (2001) .

PROGRAM COMMITTEES

Genetic and Evolutionary Computation Conference GECCO 99

PROFESSIONAL MEMBERSHIPS

Member of the American Society of Mechanical Engineers (ASME) since 1994.

Member of the institute of electrical and electronics engineers (IEEE) since 1997.

RELEVANT SKILLS

Computing:

Programming: C++, C, Pascal, Fortran 77, Prolog, Basic, TCL/TK, VTK, Java, AS/400 RPG, and AS/400 CL.

Working knowledge of Software: Mathematica, Maple, Matlab, Dymola, AutoCAD, ANSYS, ALGOR, IDEAS, BPACS and many others.

Worked under the following Platforms:

IBM, Macintosh, Silicon Graphics, Sun, VAX 9000, and the AS/400.

Languages:

Fluent in both spoken and written English and Arabic.

ADDITIONAL INTERESTS

Reading:

Political economy, Orientalism, art history and theory, ancient Arabic philosophical texts, anthropological writings on religious movements in the Middle East, and Romantic poetry.

Music:

Classical western and Arabic.

Sports:

I enjoy rowing, sailing, and hiking.

Sporting Achievements:

Summer 1990 : Awarded Silver medal in the Nile international boating regatta.

Spring 1990 : Awarded a Bronze medal in Rowing at the Egyptian National Universities Championship.

REFERENCES:

Dr. Bill Macready

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