Dr. Abdul-Hadi G. Abulrub

PhD, MSc, BSc, MIEEE, AMIMechE

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Career Objective

As a committed and enthusiastic individual, with a high level of IT skills, I am recognized for my leadership, team working and problem solving skills. During my PhD I have developed various skills such as creativity, adaptability, communication and competitiveness at top-level, on top of that, strong mathematical analytical and computer-modelling skills and learned to establish critical decisions. I believe that these are going to play a vital role in my future career. These skills, coupled with a broad thinking attitude and further research experience will be an asset in fulfilling my career ambitions.

My positive experiences at the University of Bath enhanced my desire to persist my academic and non-academic activities; furthermore, continuing my progress here would allow me to make significant escalation in my professional and personal profile, with the career goals of achieving high quality of research and teaching.

Membership of Professional Bodies

2002 – Present	Associate Member of the Institution of Mechanical Engineers
2006 - Present	Member of Institute of Electrical and Electronics Engineers

Education and Qualifications

University of Bath, Bath, England

Nov 2002 - Apr 2006	**PhD** in Modelling and Control of Contact in Magnetic Bearing/Flexible Rotor Systems
Sep 2001 - Sep 2002	**MSc** in Dynamics and Control

British Council, Amman, Jordan

2000-2001	Advanced English Language Studies.

Mut'ah University, Karak, Jordan

1994 – 2000	**BSc** Mechanical Engineering

Awards

2002 – 2005	Scholarship for Ph.D. from Mechanical Engineering Department, University of Bath.

Research Experience

May 2006 – Present **University of Bath, England (Postdoctoral Research Assistance)**

My responsibilities include

- Initialing a collaborative work with Munich Technical University. The research project involves experimental validation of the novel modeling technique developed during my PhD studies for the modeling of contact dynamics in active magnetic bearing system. The existing experimental rig in the Munich Technical University is to be used for the validation work. This would also lead to joint research work between the two institutions and joint publications.

- An experimental feasibility study will be carried out on a magnetic bearing/flexible rotor system at the University of Bath on the implementation of fuzzy logic controller to minimize energy consumption and the transmitted forces keeping the vibration within acceptable limits under base excitations.

Nov 2002 – May 2006 **University of Bath, England (PhD researcher)**

The aims and objectives of the research project are categorised into three main groups:

- To investigate the contact dynamic behaviour of a flexible rotor/bearing system. The aim is to model the complicated dynamic behaviour of a rotor when it is in contact with retainer bearings using a computationally efficient technique. The objective is to eliminate the computational inefficiency associated with non-linear stiffness and damping elements used in conventional techniques.
- To enhance the computational efficiency using model reduction techniques. The aim is to introduce a finite element rotor model involving only the required rectilinear displacements in sensor and controller nodal planes. The reduced order model is required to predict the natural frequencies of interest and system responses to step changes in unbalance with an acceptable level of accuracy.
- To use the computationally efficient reduced model to develop controllers to prevent contact or recover rotor position if contact occurs. The new controller was designed to act quickly in case of sudden change of synchronous force and also to attenuate vibration due to unknown out of balance forces. Also, the developed controller was applied in real-time using flexible rotor magnetic bearing system.
- Developing a new mathematical modeling technique for a mechatronic system of flexible rotor magnetic bearing system and analyzing non-linear dynamic behavior of rotor-bearing contact using Matlab and Simulink environment. Designing an open-loop adaptive control algorithm for magnetic bearing system and testing it for real-time applications using dSPACE data acquisition hardware system and related software.

Work Experience

Sept 2006 – present (Volunteer) **Bath University International Office**

I volunteered to work as a representative for the International Office to promote the university in Middle East countries. Representatives from the International Office and the Academic community at Bath regularly attend a number of recruitment fairs locally and internationally throughout the year. These events may provide public and personal service offering informational interviews, presentations and visits to schools, colleges and universities throughout the year. It offers the opportunity for the students and their families to explore our portfolio of programmes and find out which one is right for them.

Sept 2006 – present (Part time) **Bath University Accommodation Services and Hospitality**

Resident Tutors live alongside students in halls of residence and ensure the provision and maintenance of a high standard of welfare, health and safety, social activities and good order for students living in University residential accommodation, both on and off campus. Resident tutors require strong personality along with various skills as leadership, open-mind, confident, firm and fair.

May 2003 – May 2006 (Part time) **University of Bath Computing Service (BUCS)**

I was appointed as a team leader of a group of 8 people and responsible for staff recruiting in the Help Desk Department of the Bath University Computing Services. I developed a full training program and implemented it in practice. Also, I was responsible for advising and providing IT support for all members of the University of Bath. I developed team work skills, management skills, problem solving skills. I was responsible for sharing information operations and to communicate to ensure faults and problems are handled as effectively and efficiently as possible to maintain high levels of customer satisfaction.

Nov 2002 – Oct 2004 (Part time) **University of Bath, Learning Support Centre**

Once in a lifetime experience for assisting disabled people on an individual and group basis. Confidentiality issues and understanding student needs were the critical aspects for this job. My duty was to train students on using Microsoft Office and special software to help them in their academic progress.

Journal and Conference Publications

- M. N. Sahinkaya, **A. G. Abulrub**, P. S. Keogh and C. R. Burrows, 2007 **"Multiple Contact Dynamics for a Flexible Rotor/Magnetic Bearing System",** IEEE/ASME Transactions of Mechatronics,**12**(2), 179-189.

- **A. G. Abulrub**, M. N. Sahinkaya C. R. Burrows and P. S. Keogh, 2006 **"Adaptive Control of Active Magnetic Bearings to Prevent Rotor-Bearing Contact",** ASME International Mechanical Engineering Congress & Exposition, Chicago, Illinois.

- **A. G. Abulrub**, M. N. Sahinkaya P. S. Keogh and C. R. Burrows, 2006 **"A Constrained Lagrangian Approach for Modelling Multiple Contacts in Flexible Rotors",** The 7th IFToMM Conference in Rotor Dynamics, Vienna, Austria.

- **A. G. Abulrub**, M. N. Sahinkaya and P. S. Keogh, 2006 **"Contact Dynamics and Recursive Open Loop Adaptive Controller to Recover Rotor Position",** The tenth International Symposium of Magnetic Bearing, Switzerland.

- **A. G. Abulrub**, M. N. Sahinkaya P. S. Keogh and C. R. Burrows, 2005 **"Effective Model Reduction for Magnetically Levitated Flexible Rotor Including Contact Dynamics",** ASME International Design Engineering Technical Conferences & Computers and Information in Engineering Conference, Long Beach, USA.

- M. N. Sahinkaya, **A. G. Abulrub** and P. S. Keogh, 2004 **"Performance of Synchronous Controllers for Rotor Magnetic Bearing Systems under Bearing Contact",** Proceedings of the 7th International Conference on Motion and Vibration Control, St. Louis, USA.

- M. N. Sahinkaya, **A. G. Abulrub** and P. S. Keogh, 2004 **"On the Modelling of Flexible Rotor/Magnetic Bearing Systems when in Contact with Retainer Bearing",** Proceedings for the 9th International Symposium on Magnetic Bearings, Kentucky, USA.

Presentations

- **"Prospects in Education, Research and Innovation at the University of Bath",** International Mechanical Engineering Presentation for British Council, Amman, Jordan, April 2007.

- **"A constrained Lagrangian Approach for Modelling Multiple Contacts of Flexible Rotors",** IFToMM 7th International Conference on Rotor Dynamics, Vienna, Austria, September 25-28, 2006.

- **"Higher Education at University of Bath: Students Prospects and Opportunities",** International Mechanical Engineering Presentation for British Council, Amman, Jordan, June 2006.

- **"Modelling and Control of Flexible/Rotor Active Magnetic Bearings System When in contact",** International Mechanical Engineering Presentation for The University of Jordan, Amman, Jordan, June 2006.

- **"Rotor-Stator Contact Dynamics in Magnetic Bearing Systems",** Power Transmission course, University of Bath, Bath, U.K., May 2004.

- **"Modelling and Control of Contact in Magnetic Bearings Flexible Rotor Systems",** Department of Mechanical Engineering, University of Bath, Bath, U.K., Nov, 2003.

- **"Using FFT and Wavelet Signal Processing Techniques in Active Magnetic Bearing",** For the degree of M.Sc. in Dynamics and Control, University of Bath, Bath, U.K., Aug, 2002.

Proposals and Grand applications

April 2007	Promotional Activity Grand, "**Private visit to the British council, Universities and Research centres in Jordan**", International Office, University of Bath, England.
March 2007	Promotional Activity Grand, **"Education UK Exhibition in Kuwait and Bahrain",** International Office, University of Bath, England.
January 2007	Submitted for EPSRC, **"A Desktop Magnetic Wind Tunnel for Dynamic Testing of Micro Air Vehicles"** with Dr M. N. Sahinkaya (**PI***), Prof I. A. Gursul and Dr P. S. Keogh.
November 2006	(**PI***) Submitted for the University of Bath, **"Promotion Activities in Jordan and Middle East"**.

*PI: Principle Investigator

Research Expertise

- Vibration Control and modeling of magnetic bearing/flexible rotor systems
- Modern control and application of magnetic bearings/flexible rotor systems
- Modeling and Control of high speed machinery and mechatronic systems
- Contact Dynamics analysis

Teaching Skills

2007 - present	Assistance Supervisor	MSc student project in Mechatronic with Dr M. N. Sahinkaya, Department of Mechanical Engineering, University of Bath.
2004 – 2006	Laboratory Instructor	Fluid Power Labaratory with Dr M. A. Sokola, Department of Mechanical Engineering, University of Bath. - Control System Stability Laboratory; postgraduate session
June 2004	Assistance Supervisor	"Modelling of Contact Dynamics in Magnetic Bearing Systems" James Mumford. With Dr M. N. Sahinkaya, Department of Mechanical Engineering, University of Bath.
2002 – 2003	Teaching Assistance	Control System Tutorial with Dr M. N. Sahinkaya, Department of Mechanical Engineering, University of Bath. - Advised undergraduate Mechanical Engineering students during tutorial hours

Practical Skills

Computer Skills

Matlab and Simulink including real-time workshop (high performance programming language environment and graphical interface for modeling, simulating, and analyzing systems by means of mathematical representations).

MS Windows XP and 2000, Microsoft Office (Word, Excel, PowerPoint), Microsoft Visio, Microsoft project, Microsoft FrontPage, Microsoft Publisher, Latex word processing and Macromedia Dreamweaver XM.

Hardware Skills

dSPACE Solutions for control with automatic implementation of Simulink i.e. RTI-MP, MLIB/MTRACE, and Control Desk

Language Skills

Fluent in English and Arabic.

Communication skills
In addition to my communication capabilities within our research group, I was responsible for advising and providing IT support for all members of the University of Bath through my employment in the University Computing Services. My work with Learning Support department is another good indication of my strong communication skills. I organised international meetings and presentations which requires critical coordination among various deportments to ensure that accurate information is obtained.

I am currently engaged with international activities for promoting University of Bath which requires distinctive communication skills. I am also responsible for maintaining up to date information for resident tutors system on virtual environment which requires exceptional communications level.

Finally, living in a foreign country offers a rich environment of diverse cultures, which is extremely wealthy of extraordinary knowledge and respect for others morals and beliefs.

Personal Activities

June 2006 – present **International Promotion for University of Bath**

I volunteered to work as a representative for the International Office to promote the university in Middle East countries. I undertook a visit to Jordan (sponsored myself) to promote the University and the Department of Mechanical Engineering, the International Office supplied the required material i.e. prospects and brochures. During my visit I gave presentations at the British Council and also the University of Jordan as well as meeting key academics at the King Abdullah II Design and Development Bureau. The British Council presentation was advertised in the main national newspaper that boosted the public interest. As a result of my visit several academic institutions have shown a serious interest and willingness to cooperate and develop relations with the University of Bath. I submitted a very detailed report of my activities and a proposal on potential future opportunities. The proposal was discussed and received very positively within the Department.

Aim and objectives

The aim of developing relations with Jordon is to promote awareness of the University of Bath on aspects of research and learning & teaching by targeting the British Council, public, private schools and Universities (governmental and private) as well as research organisations.

The specific objectives are, but not limited to:

1. Promoting the Department of Mechanical Engineering and the University of Bath to offer research sabbaticals to key academics within Jordanian institutes.

2. Recruiting into Mechanical Engineering and University of Bath high quality fee-paying undergraduate and postgraduate students.

3. Implementing methods and approaches to facilitate (1) and (2) and to roll-out successful activities for adoption by other Departments in the University and also to use this engagement as a spring-board into other Middle Eastern countries.

References on this particular project:

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