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**SUMMARY**

A dynamic engineer with a strong record of achievement combining skills in diverse areas of work and research development, group/staff leadership, program development and project management, building partnerships and community relations. Seeking a full time position that will allow me to utilize my skills and experience with possibility of growth and acquisition of new skills.

**EDUCATION**

**Rensselaer Polytechnic Institute (RPI)**, Troy, New York *May, 2007*  
 Doctor of Philosophy in Mechanical Engineering.  
**Rensselaer Polytechnic Institute (RPI)**, Troy, New York *Dec, 2004*  
 Master of Science in Mechanical Engineering.  
**Jordan University of Science and Technology**, Irbid, Jordan *Feb, 2002*  
 Bachelor of Science in Mechanical Engineering.

**RESEARCH EXPERIENCE**

**The Hashemite University, Mechatronics Engineering Department** *2008-present*  
 Associate Professor

- Developing and implementing alternative energy recourses that is suitable for urban and rural areas in Jordan and the Middle East.
- Applying advanced control schemes to achieve high efficiency wind energy generation.
- Apply a multiobjective fuzzy genetic algorithms approach for minimal power consumption of thermal systems in automotive.
- Intelligent optimization techniques for open loop stepping motor drive.
- Advanced control schemes for optimal power generation of a solar, wind, grid power system.
- Computation mechanics and meshfree methods.
- Simulation of virtual surgery procedures.

**Northwestern University, Department of Mechanical Engineering** *Jul 2007-Jan 2008*  
 Post doctoral Fellowship, Advisor Professor Ted Belytschko

- Applying the element free Galerkin method for the analysis of dynamic crack propagation problems.

**RPI, Department of Mechanical Engineering**

Research Assistant

*Advanced Computational Research (ACoR) Laboratory* *2004-Jul 2007*

- Developed a genetic algorithm based look up table approach for effective numerical integration in the method of finite spheres a truly meshless computational technique for boundary value problems.
- Adapted the method of finite spheres for the solution of solid mechanics problems, beams, plates, shells, etc...
- Using the method of finite spheres for the solution of nonlocal strain gradient problems in elasticity and plasticity.
- Investigated the effect of a nano-particle in an electroosmotically driven flow interacting with AFM tip.
- Analyzed and identified the mechanical properties of collagen fibers and developed a multiscale mathematical model to describe its behavior.
- Developed a model order reduction technique for real time surgery simulation using PAFF.

*Mechatronics Laboratory* *2003-2004*

- Constructed and designed a genetic algorithm fuzzy logic optimization algorithm to control a stepping sequence in a stepper motor driven system.
- Applied artificial intelligence to the solution of constrained and unconstrained nonlinear optimization problems.

**TEACHING EXPERIENCE**

**Assistant Professor, Mechatronics Engineering Department, The Hashemite University** *2008-present*

- Digital Control
- Modern Control and Control Lab
- Hydraulic and Pneumatic Control Systems
- Microcontroller
- Engineering Ethics and Technical Writing

**Teaching Assistant, Mechanical Engineering Department, RPI** *2004-2006*

- *Mechatronics*; developed and constructed a set of lab experiments to illustrate different mechatronic systems. Taught and worked with students as individuals and groups in the lab to familiarize them with these systems. *Fall 2004*
- *CAD*; Taught a computer aided design class using Solidworks. *Fall 2005*
- *Introduction to finite element*; wrote a short manual for ABAQUS 6.5 to familiarize students to ABAQUS FEM environment. *Fall 2005, Spring 2006*
- *General manufacturing processes*; Help students to understand different manufacturing process used in industry and take them to insight locations to get familiarized with the usage of these processes. *Fall 2005, Spring2006*

## THESIS

*On the Development and Some Application of a Genetic Algorithm Based Lookup Table Approach for Efficient Numerical Integration in the Method of Finite Spheres*

## SKILLS

- *Programming skills:*  
FORTRAN, C, C++, JAVA, MATLAB, MAPLE.
- *FEM packages:*  
ABAQUS, ALGOR, ANSYS, NASTRAN, COSMOS.
- *CAD packages:*  
MECHANICAL DESKTOP, SOLIDWORKS, AUTOCAD.
- *Control Packages:*  
LABVIEW, MATLAB SIMULINK, dSPACE.

## AWARDS

NSF Summer Institute on Nano Mechanics and Materials Travel Grant *Jul 2006*

RPI, Research Assistance at Advanced Computational Research (ACoR) Laboratory *2004-2007*

RPI, Teacher Assistance scholarship *2004-2006*

Hashemite University, scholarship for distinctive students. *2003-2006*

## SHORT COURSES

7th World Congress on Computational Mechanics  
Multiscale Computational Methods and Applications.  
Prof. Wing Kam Liu  
Prof. Jacob Fish

Professional Leadership Series for Graduate Engineering Students, Archer Center for Student Leadership Development.

LABVIEW Core 1 and Core 2, CLAD certified.

## PUBLICATIONS

### *Conferences*

- Macri M., BaniHani S., Aslam A. and De S. Some Recent Advances in the Method of Finite Spheres: Practical Implementation, Stability Analysis and Application to Multiscale Modeling. *Third International Workshop Meshfree Methods for Partial Differential Equations*, 2005.
- BaniHani S. and De S. Development of a genetic algorithm-based lookup table approach for efficient numerical integration in the method of finite spheres with application to the solution of beam and plate problems. *Third M.I.T. Conference on Computational Fluid and Solid Mechanics*, 2005.
- BaniHani S. and De S. The solution of functionally graded plate problems using the method of finite spheres and a genetic algorithm-based numerical integration approach. *7<sup>th</sup> World Congress for Computational Mechanics*, 2006.
- Numerical Inf-Sup test of the method of finite spheres for the solution of plate problems, US National Congress on Computational Mechanics, 2007.

*Journal papers*

- BaniHani S. and De S. Development of a genetic algorithm-based lookup table approach for efficient numerical integration in the method of finite spheres with application to the solution of thin beam and plate problems. *International Journal for Numerical Methods in Engineering*, V67 no. 12, 2006, pp 1700-1729 .
- BaniHani S. and De S. A computationally efficient technique for the solution of Timoshenko beam and Mindlin-Reissner plate problems using the method of finite spheres. *International Journal of Computational Methods*, V 3 No.4, 2006, pp 465- 501.
- BaniHani S. and De S. On the evaluation of the method of finite spheres for the solution of Reissner-Mindlin plate problems using the numerical inf-sup test. *International Journal for Numerical Methods in Engineering*, V70 No 11, 2007, pp1366-1386.
- BaniHani S. and De S. Method of finite spheres solution of micron-scale plasticity based on a strain gradient formulation, *Computers and Structures*, V86 No 23-24. 2008, pp 2109-2122.
- BaniHani S. and De S. A comparison of some model order reduction methods for fast simulation of soft tissue response using the point collocation method of finite spheres (PCMFS), *Engineering with Computers*, V. 25 No.1, 2009, pp 37-47.
- Banihani S, Dutkin M, Ali S, Arikatla VS, Sankaranarayanan G, De S. Plug-and-Play Tool Handles for Laparoscopic Surgery Simulators. *Stud Health Technol Inform*. 2009;142:28-30.
- Al-Araidah O., Batayneh W., Darabseh T, BaniHani S., 2010, "Conceptual Design of a Single DOF Human-Like Eight-Bar Leg Mechanism". *Jordan Journal of Mechanical and Industrial Engineering*, V. 5 No. 4, 2011 pp 285 - 289.
- Ababneh M., Al-Jarrah A., Al-Widyan K., BaniHani S." Variable Structure Controller Schemes Based on Work and Energy Principle for SIMO Systems" ". *Jordan Journal of Mechanical and Industrial Engineering*, V.5 No 5, 2011, pp 407- 417.
- BaniHani S., Al-Widyan K., Al-Jarrah A., Ababneh M., "A Genetic Algorithm Based Lookup Table Approach for Optimal Stepping Sequence of Open Loop Stepper Motor Systems" *J. Control Theory Appl.* (2013) 11: 35.
- AlMomani T, Vigmostad SC, Chivukula VK, Al-zube L, Smadi O, BaniHani S. Red blood cell flow in the cardiovascular system: a fluid dynamics perspective, *Crit Rev Biomed Eng*. 2012;40(5):427-40.
- BaniHani S., Rabczuk T., Almomani T., POD for real time simulation of hyperelastic soft biological tissue using the point collocation method of finite spheres, *Mathematical Problems in Engineering*., 2013.
- Al-Jarrah, A, Salah, M, Banihani, KS. Applications of various control schemes on a four-bar linkage mechanism driven by a geared DC motor. *WSEAS Trans Syst Contr* 2015; 10: 584–597.
- Al-Jarrah, A., Ababneh, M., Bani Hani, S., Al-Widyan, K., Synchronization of Chaotic Systems with Uncertain Time-Varying Parameters, (2015) *International Review of Mechanical Engineering (IREME)*, 9 (6), pp. 568-575.
- Almomani T., Bani-Hani S., Bdour A., Alsaraira A., Smadi O., Al-Jarrah A., Abdallat R, Awad S. Influence of erythrocyte shape on platelet scattering towards vessel wall, *International Journal of Biomedical Engineering and Technology* 2016 21:3, 264-278.
- Ababneh, M., Al-Jarrah, A., Sha'ban, H., BaniHani, S., Al-Jarrah, A., AlMomani, T., AlHammad, Y., Recovering Waste Heat from Automobile Engine Using Thermoelectric Power Generators, (2017) *International Review of Mechanical Engineering (IREME)*, 11 (11), pp. 845-854.

*Book Chapters*

- S. BaniHani, S. De. "Genetic Algorithms for Meshfree Numerical Integration" Chapter in *Meshfree Methods for Partial Deformational Equations III*(Lecture Notes in Computational Science and Engineering), M. Griebel and M.A. Schweitzer ed., Springer, 2007.

**REFERENCE LIST**

Available upon request