

## **Objective**

Seeking a position in engineering design & development, and willing to relocate anywhere in the US

## **Recent Employment**

Adjunct Professor and Post-Doctoral Research Staff, The University of Texas at Arlington, May 2015 – Present Graduate Research and Teaching Assistant, The University of Texas at Arlington, Sept. 2010 – May 2015

## **Computational Skills**

- Strong knowledge of **computer aided design (CAD)** using SolidWorks, Pro-Engineer, AutoCAD and CATIA
- Adept at **Linear finite element analysis (FEA)** of complex structural components and development of system level design using ANSYS Workbench and APDL, Abaqus and Hypermesh
- Experienced at **Non-linear finite element analysis (FEA)** of biomechanical systems involving hyperelastic materials, contact analysis and large deformations using ANSYS Workbench and APDL
- Extensive **meshing/grid generation capability** of complex geometries using ANSYS Workbench
- Skilled at **mechanical design** utilizing elastic/plastic/hyperelastic materials and advanced mechanics of **composite materials**
- Proficient at **GD&T and CAD** designing utilizing **design for manufacturability** approach for molding using Moldflow
- Adept at **Reverse engineering** to solve complex mathematical problems numerically using MATLAB and Mathematica
- Experienced with **Dynamic structural & modal analysis** using computational tools such as ANSYS, MATLAB and Mathcad
- Skilled at statistical analysis, **simple and multiple linear regression** and **design of experiments**
- **Proficient in using the following engineering programs**  
SOLIDWORKS, PRO-ENGINEER, AUTODESK AUTOCAD, CATIA, ANSYS WORKBENCH, ABAQUS, ANSYS APDL, HYPERMESH, MATHEMATICA, MATLAB, MATHCAD, LABVIEW, C++, SAS, DESIGN EXPERT, MOLDFLOW

## **Experimental Skills**

- Design and fabrication of components using CAD and FDM **additive manufacturing processes**
  - Created numerous CAD models and .stl files using SolidWorks for extensive usage of 3D printer
  - Designed and fabricated several preliminary designs and concepts using 3D printing technology for a medical device
  - Utilized various polymeric materials for 3D printing purposes in a custom built 3D printer utilizing slic3r and Repetier
- Material characterization using **MTS electromagnetic testing machine** in elevated temperature in a thermostatic chamber
  - Conducted tensile and compression tests on elastic materials in different temperatures
- Experienced in using lathe machine, milling machine, upright/gang drilling machines and metal arc welding machine
- Installed sensors using **soldering in metallic alloy** samples to estimate mechanical properties
  - Designed techniques to install sensors in testing samples for examining elastic properties
  - Analyzed stress-strain data from MTS machines to debug and calibrate the hardware with the sensors
- Programmed and installed **data acquisition system** modules using National Instruments Hardware
  - Skilled at electromechanical testbed design to collect and analyze data for testing designed devices
  - Developed testbeds using various sensors, NI data acquisition devices, LabVIEW and electromagnetic actuators

## **Work Experience**

**Graduate Research Assistant, The University of Texas at Arlington, Sept. 2010 – May 2015**

- Performed structural analysis of cornea using SolidWorks and ANSYS to determine postsurgical corneal deformation
- Developed a FE model for bond strength calculation in micro welding of transparent materials (glass) using ANSYS and designed a LabVIEW based testbed for data validation
- Designed a novel surgical instrument for DSAEK surgery utilizing SolidWorks and ANSYS
- Performed material characterization, CAD design and fabrication of MEMS related devices using lasers
- Performed structural analysis of cornea in ANSYS post implantation of intra-stromal corneal ring segments
- Conducted multiple linear regression analysis of laser micro welded transparent (glass) plates for bond strength statistical reliability analysis using SAS
- Evaluated thermal distribution using ANSYS for excimer laser-cornea interaction during LASIK surgery

## **Individual Projects, The University of Texas at Arlington**

- Participated in analyzing stress concentrations in a denture to quantify failure mastication loads, using ANSYS
- Performed analysis and optimization of a finned heat sink in ANSYS Icepak for convection heat transfer
- Performed structural optimization of drill strings used in the oil and gas industry utilizing MATLAB
- Performed length calculation of a wind chime without a Measuring Tape experimentally and theoretically by utilizing pipe theory and digital signal processing (DSP) in LABVIEW and MATLAB
- Developed a master-slave anthropomorphic robotic hand using SolidWorks, ANSYS, rotary displacement sensors, PIC 18 micro controller and stepper motors for surgical applications (Senior Design Project)

### ***Graduate Teaching Assistant, The University of Texas at Arlington, Sept. 2010 – May 2015***

- Lab instructor for junior/senior level Measurements II Lab. Responsibilities included hardware setup, maintenance and improvement, assisting students during experiments, resolving conflicts and grading reports
- Upgraded all laboratory testbeds to LabVIEW based DAQ system and updated the lab manuals appropriately

### ***Intern/Co-op at Intech Process Automation, (2008, 2010)***

**INTECH** *delivers industrial automation solutions to customers in the Oil & Gas, Petro-Chemicals, Energy, and other sectors*

- Worked on SOKU Gas Flow Station Upgrade Project at Intech Lahore office. Performed heat load calculations, selected components for control panels and completed the hardware functional design specification test which included extensive use of MS Excel and writing user manuals
- Assisted in panel design using AutoCAD and wrote a Visual Basic (VB) code to interface MS Excel with AutoCAD to generate automated technical drawings

### **Education**

- ***Ph.D. in Mechanical Engineering***

The University of Texas at Arlington (UTA)

*Sept. 2010 – May 2015*

*CGPA: 3.9 out of 4.0*

**Dissertation Title:** Biomechanical analysis of the cornea to improve postsurgical outcomes through finite element analysis

- ***B.S. in Mechatronics & Control Engineering***

The University of Engineering and Technology (UET), Lahore, Pakistan

*Sept. 2005 – Sept. 2009*

*CGPA: 3.8 out of 4.0*

### **Journal Publications**

- S. Khan and P.S. Shiakolas, "Application of finite element analysis to study the mechanical behavior of cornea due to implantation of intra-stromal corneal ring segments", ASME Journal of Biomechanical Engineering. (In Review)
- S. Khan and P.S. Shiakolas, "Finite element structural analysis of allograft in Descemet's stripping endothelial keratoplasty (DSAEK) to predict endothelial cell loss locations", Journal of Cataract & Refractive Surgery. (In Review)
- S. Khan and P.S. Shiakolas, "Descemet's stripping automated endothelial keratoplasty (DSAEK) tissue insertion devices: A review", Journal of Ophthalmic and Vision Research. (Accepted for publication)
- S. Khan and P.S. Shiakolas, "Design of a novel allograft insertion device for Descemet's stripping automated endothelial keratoplasty (DSAEK) surgery". (Under Review at UTA for invention disclosure application)
- S. Khan, P.S. Shiakolas, and M. Rizwan, "An overview on performance characteristics of laser in-situ keratomileusis using lasers and identification of challenges", Micro and Nanosystems, 4(4), 284-295 (2012).

### **Conference Publications**

- S. Khan, M. Rizwan, and P.S. Shiakolas, "Finite element analysis of spot bonding in transparent material using ultrafast lasers", ASME 2012 International Mechanical Engineering Congress & Exposition, Houston, USA.
- S. Khan and P.S. Shiakolas, "To understand myopic alleviation through finite element analysis of a cornea with intrastromal corneal ring implant", ASME 2015 International Mechanical Engineering Congress & Exposition, Houston, USA.

### **Conference Presentations**

- S. Khan and P.S. Shiakolas, "Finite element modeling of Descemet's stripping automated endothelial keratoplasty (DSAEK) surgery to improve surgical outcomes", ACES symposium, The University of Texas at Arlington, Arlington, TX, Mar. 21 2014. (This work was recognized by the judging committee and awarded with an honorable mention and cash award)
- S. Khan and P.S. Shiakolas, "A study of finite element structural analysis of allograft for endothelial keratoplasty", IEEE Medical Device Symposium, The University of Texas at Dallas, Dallas, TX, Nov. 7, 2014.
- S. Khan and P.S. Shiakolas, "Finite element structural analysis of the human cornea to understand and alleviate myopia", ACES symposium, The University of Texas at Arlington, Arlington, TX, Mar. 25, 2015.

### **Awards & Honors**

- Accepted in the BS to PhD program in MAE at UTA
- Enhanced graduate teaching assistantship at UTA, 2010-15
- Complete tuition waiver scholarship at UTA, 2010-15
- Dean's Dissertation Fellowship at UTA, 2014
- Dr. Shamin S Malik Engineering Scholarship, 2015
- I-Engage Mentoring Fellowship at UTA, 2014
- Panel judge, ACES undergraduate poster competition, 2014
- First place in Intra University Technical Presentation Competition organized by ASME UET, 2009

- Awarded academic distinction by Cambridge University for best 3 GCE As levels at Brilliance in Pakistan awards, 2004

### **Professional Memberships**

ASME, BMES, ASC, IEEE

### **Co-Curricular Activities**

- President, Pakistan Student Association, UTA 2013-2014