Muhammad U. Majeed

Applied Mathematician, Electrical Engineer
Sunnyvale, CA 94086 (US permanent resident)

usmanmajeed.us
+1-408-728-6309
muhammadusman.majeed@kaust.edu.sa

Education

- **King Abdullah University of Science and Technology (KAUST)** — Thuwal, KSA
  Ph.D. Candidate in Applied Mathematics (CGPA 3.89/4.0) — *Spring 2016*
  - Advisor: Taous Meriem Laleg-Kirati , Email: taousmeriem.laleg@kaust.edu.sa
  - Thesis: Iterative observer designs for source and boundary estimation problems for systems governed by elliptic equations (Design of optimal algorithms based on state observers and Kalman filters)
  - Key Courses: Inverse Problems Theory, Mathematical Modeling, Control Theory of PDEs, Real and Functional Analysis, Linear and Non-linear PDEs, Advanced Topics in Wave Propagation, Finite Element Methods.

- **King Abdullah University of Science and Technology (KAUST)** — Thuwal, KSA
  M.S. Applied Mathematics (CGPA 3.33/4.0) — *December 2012*
  - Key Courses: Probability and Random Processes, Numerical Optimization, Numerical Linear Algebra, Applied PDEs, Numerical PDEs, Inverse Problems

- **University of Engineering and Technology (UET)** — Lahore, PK
  B.S. Electrical Engineering (CGPA 4.0/4.0) — *September 2009*
  - Key Courses: Electromagnetic Theory, Algorithm Design, Antenna Design Theory, Assembly Language, Data Structures, C, C++, Signal Processing, Control Theory and Design, Network Analysis

Research Interests

- Algorithm development, mathematical modeling, inverse problems, finite difference methods, control theory for partial differential equations, dynamical systems control.

Teaching Experience

- **King Abdullah University of Science and Technology (KAUST)** — Thuwal, KSA
  Teaching Assistant (Graduate Level Courses) — *2013, 2014, 2015*
  - TA for AMCS394 Special Topics in Applied Maths
  - TA for AMCS370 Inverse Problems
  - TA for AMCS206 Numerical Methods
  - TA for AMCS231 Applied Partial Differential Equations

- **University of Engineering and Technology (UET)** — Lahore, PK
  Lecturer (Under-grad Level) — *Sept. 2009 - July. 2011*

- Delivered lectures on Electromagnetics, Linear Algebra and Differential Equations
- Supervised laboratory experiments for Power Electronics and Networking Labs
- Prepared course material including laboratory experiments, lectures, exams, homeworks and practice problems

Research Experience

- **California State University Northridge (CSUN)** California, USA
  Applied Maths Lab Research Team Member *May. 2012 - Aug. 2012*
  - Developed methodology on solving forward problems with diverse applications in earth-science and cardio-vascular systems
  - Collaborated on development and testing of algorithm which increased efficiency by nearly 50% compared to existing algorithms
  - Successfully designed and parallelized Finite Element code using MPI (Message Passing Interface)
- **Space and Upper Atmosphere Research Commission (SUPARCO)** Lahore, PK
  Research Engineer *June. 2009 - Sept. 2009*
  - Worked during summer in a team designing an integral part of a low earth orbit weather satellite
  - Researched and reviewed the design of 2.0 GHz Corrugated Horn Antenna
  - Assisted in multiple projects in antenna design laboratory
- **British American Tobacco Company (BAT)** Islamabad, PK
  Country-wide Research Proposal Finalist *Jan. 2009 - June. 2009*
  - Finalist in competitive country-wide "Battle of Minds"research business proposal competition
  - Compiled results and concluded feasibility report and presented findings on 50MW Wind Energy Power Plant Project
  - Enjoyed working in a diverse team environment on a corporate social responsibility project.
- **Al-Khwarizmi Institute of Computer Science (KICS)** Lahore, PK
  Software Development Team Member *June. 2008 - Dec. 2008*
  - Worked on the use of ZigBee wireless networks for surveillance applications
  - Presided a team working on image transfer using ZigBee modules
  - Studied performance metrics of image transfer over low data rate ZigBee network

Journal Publications

- M.U. Majeed and T.M. Laleg-Kirati, "A dimension decomposition approach based on iterative observer design for an elliptic Cauchy problem", 2015. (*archive pre-print*)
- M.U. Majeed and T.M. Laleg-Kirati, "Boundary estimation for infinite dimensional steady state equation system using observers", 2014. (*archive pre-print*)

Selected Conference Talks and Proceedings

1. M.U. Majeed and T.M. Laleg-Krati, "Boundary estimation for infinite dimensional elliptic Cauchy problem", SIAM Conference on Control and Its Applications (CT'15), Paris France, 2015.
   (***invited session talk***)

2. M.U. Majeed and T.M. Laleg-Krati, "An optimal iterative algorithm to solve Cauchy problem for Laplace equation", 3^{rd} International Conference on Control Engineering and Information Technology (CEIT), 2015.
   (***best paper award***)

3. M.U. Majeed and T.M. Laleg-Krati, "Two-step observer approach to solve Cauchy problem for Laplace equation", (PICOF'14) Inverse Problems, Control and Shape Optimization, Tunisia, 2014.

4. M.U. Majeed and T.M. Laleg-Kirati, "Cauchy Problem for Laplace Equation on a Square Domain using Observers", 8th International Conference on Inverse Problems in Engineering (ICIPE), Krakow Poland, 2014.

5. M.U. Majeed, C. Zayane-Aissa and T.M. Laleg-Kirati, "Cauchy Problem for the Laplace's Equation: An Observer based Approach", The 3rd International Conference on Systems and Control (ICSC'13), Algiers Algeria, 2013. (*online link*)

Honours and Awards

Best Paper Award at IEEE conference CEIT (out of 800 submissions) 2015
KAUST Graduate Fellowship Award 2011-2015
Runners up in countrywide "Battle of Minds"by British American Tobacco Company, PK . 2009
Best Business Proposal of the year 2009 by UET and BAT, PK 2009
Graduated 1^{st} in electrical engineering class (60 students) 2009
Board of Education Outstanding Talent Scholarship (full under-grad university funding) . . . 2005
Certificate of Distinction in Pre-Engineering (A-Levels) 2005
Certificate of Distinction (O-Levels) 2003

Skills

- **Languages:** Fluent in English, Native in Urdu, Beginner in Arabic
- **Programming:** MatLab, Python, Mathematica, LaTeX, C, C++,

References

I shall be happy to provide references on request.