
Mashhood Ishaque

Department of Computer Science
Tufts University
Medford, MA 02155
Email: mishaque@cs.tufts.edu
<http://www.eecs.tufts.edu/~mishaq01/>

Professional Preparation

Tufts University, Medford, MA

Computer Science, Ph.D. Candidate [Expected Graduation: August, 2010].

“Geometric Data Structures”; Advisor: Diane L. Souvaine

Committee: Lenore J. Cowen, Bruce Boghosian, Csaba D. Tóth, and Erik D. Demaine

George Mason University, Fairfax, VA

Computer Science, M.S. 2006; GPA 4.0.

“Temporal Planning and Reasoning”; Advisor: Alexander H. Levis.

Karachi University, Karachi, Pakistan

Computer Science, B.S. 2002; GPA 3.7.

“Knowledge Verification of Intelligent Agents”; Advisor: Abbas K. Zaidi.

Appointments

Tufts University

Research Assistant, Computational Geometry Group, 2006-.

Teaching Assistant, Computer Science Department, 2006-.

George Mason University

Research Assistant, System Architectures Lab, 2004-2005.

Matrix Systems

Software Engineer, 2000-2003.

Honors

Outstanding Graduate Researcher in Engineering, Tufts University, 2009-10.

Awarded funding from Tufts Graduate Student Travel Fund to present work at ISAAC, 2009.

Tufts Graduate Institute for College Teaching (GIFT) Fellow, 2008.

Awarded student travel grant for DNA13 conference, Memphis, TN, 2007.

Outstanding Graduate Student, George Mason University, 2005-2006.

George Mason University Masters Fellowship, 2004 and 2005.

Grants and Proposals

Lead writer for successful proposal to NSF CCF for research on “Geometric Data Structures”.

Helped in writing a proposal to NSF CDI to secure funding for research on geometric algorithms for nano self-assembly.

Wrote successful proposal to the Tufts Summer Scholars Program (2008) to fund an undergraduate to work on convex partitions with 2-edge-connected dual graphs.

Wrote a proposal for NSF REU program to get an undergraduate to work on compatible matching conjecture.

Synergistic Activities

Mentoring a sophomore “Sarah Cannon” to work on finding desirable even orientations in a graph. Sarah won the “most creative research or independent project” award for her work at New England Undergraduate Computing Symposium, 2010.

Mentored an undergraduate student “Marwan Al-Jubeh” as a part of Tufts Summer Scholar Program. The research resulted in refuting an important conjecture (“Two Spanning Trees Conjecture”). Marwan recently completed his honors thesis.

External reviewer for the conferences: CCCG, ESA, IEEE SMC, SoCG.

Guest lecturer in Introduction to Computer Science classes in fall 2006, summer 2007, fall 2007, and fall 2008. Talks gave students exposure to current research of the “Tufts Computational Geometry” group.

Taught a mini-course on computational geometry in summer 2006 at Karachi University in Pakistan. The course was attended by around 12 undergraduate students (both males and females). Also talked about opportunities for higher studies in the United States of America.

Developed a software to analyze computer science curriculum for compliance with ACM Computing Curricula, Steelman draft, 2001. The software won “ACM Excellence Award for Community Service, 2002”.

Collaborators

PhD Thesis Advisor: Diane L. Souvaine (Tufts University)

MS Thesis Advisor: Alexander H. Levis (George Mason University)

Other co-authors/collaborators: Marwan Al-Jubeh (Tufts), Gill Barequet (Technion), Nadia M. Benbernou (MIT), David Charlton (MIT), Erik Demaine (MIT), Martin Demaine (MIT), Sándor P. Fekete (Technische Universitt Braunschweig), Michael Hoffmann (ETH Zurich), George Filiotis (Tufts), Eddie Goldberg (Tufts), Alexandra Lauric(Tufts), Anna Lubiw (Waterloo), Faisal Mansoor (George Mason University), Eynat Rafalin (Google), Kristóf Rédei (Tufts), André Schulz (MIT), Robert Schweller (University of Texas, Pan American), Bettina Speckmann (TU Eindhoven), Godfried Toussaint (McGill University), Csaba D. Tóth (University of Calgary), Andrew Winslow (Tufts), and Abbas K. Zaidi (George Mason University)

Journal Articles

M. Al-Jubeh, M. Ishaque, K. Rédei, D. L. Souvaine, C. D. Tóth, P. Valtr. “Augmenting the Edge Connectivity of Planar Straight Line Graphs to Three”, submitted to special issue of *Algorithmica*.

M. Al-Jubeh, M. Hoffmann, M. Ishaque, D. L. Souvaine, C. D. Tóth. “Convex Partitions with 2-Edge Connected Dual Graphs”, 2009, to appear in special issue of *Journal of Combinatorial Optimization*.

M. Ishaque, A. H. Levis, A. K. Zaidi. “Project Management Using Point Graphs.” *Journal of System Engineering*, (2009), 12(1), 2009.

E. D. Demaine, M. L. Demaine, S. P. Fekete, M. Ishaque, E. Rafalin, R. T. Schweller, D. L. Souvaine. “Staged Self-Assembly: Nanomanufacture of Arbitrary Shapes with $O(1)$ Glues.” Special issue of *Journal of Natural Computing* 7(3) (2008), 347-370.

A. K. Zaidi, M. Ishaque, A. H. Levis. “Using Temporal Reasoning for Criminal Forensics against Terrorists.” Collection of selected papers from *Descartes Conference on Mathematical Models in Counterterrorism* (2007), Center for Advanced Defense Studies, Springer Series.

Book Chapters

A. K. Zaidi, M. Ishaque, A. H. Levis. “Combining Qualitative and Quantitative Temporal Reasoning for Criminal Forensics.” *Mathematical Methods in Counterterrorism*, (2009), Springer.

Conference Papers

G. Barequet, N. M. Benbernou, D. Charlton, E. D. Demaine, M. L. Demaine, M. Ishaque, A. Lubiw, A. Schulz, D. L. Souvaine, G. Toussaint, A. Winslow. “Bounded-Degree Polyhedronization of Point Sets.” Submitted.

M. Ishaque, D. L. Souvaine, and C. D. Tóth. “Lower Bounds for Simplex Emptiness and Related Problems.” Submitted.

M. Al-Jubeh, G. Barequet, M. Ishaque, D. L. Souvaine, C. D. Tóth, A. Winslow. “Connecting Obstacles in Vertex-Disjoint Paths.” *26th European Workshop on Computational Geometry (2010)*, Dortmund, Germany.

* M. Al-Jubeh, M. Ishaque, K. Rédei, D. L. Souvaine, C. D. Tóth. “Tri-Edge-Connectivity Augmentation for Planar Straight Line Graphs.” *20th International Symposium on Algorithms and Computation (2009)*, LNCS (5878), Springer, 902-912.

* M. Al-Jubeh, M. Hoffmann, M. Ishaque, D. L. Souvaine, C. D. Tóth. “Convex Partitions with 2-Edge Connected Dual Graphs.” *15th International Computing and Combinatorics Conference (2009)*, LNCS (5609), Springer, 192-204. Abstract appeared in *18th Fall Workshop on Computational Geometry (2008)*, 63-64.

M. Ishaque, B. Speckmann, C. D. Tóth. “Shooting Permanent Rays Among Disjoint Polygons in the Plane.” *25th Annual ACM Symposium on Computational Geometry (2009)*, 51-60.

M. Ishaque, C. D. Tóth. “Relative Convex Hulls in Semi-Dynamic Subdivisions.” *Proc. 16th Annual European Symposium on Algorithms (2008)*, 780-792.

* N. M. Benbernou, M. Ishaque, D. L. Souvaine. “Restricted Triangular Range Searching.” *Proc. of the 20th Canadian Conference on Computational Geometry (2008)*, 15-18.

* M. Ishaque, F. Mansoor, A. K. Zaidi. “An Inference Mechanism for Point-Interval Logic.” *Proc. of the 21st International Florida Artificial Intelligence Research Society Conference (2008)*.

N. M. Benbernou, E. D. Demaine, M. L. Demaine, M. Hoffmann, M. Ishaque, D. L. Souvaine, C. D. Tóth. “Disjoint Segments have Convex Partitions with 2-Edge Connected Dual Graphs.” *Proc. of the 19th Canadian Conference on Computational Geometry (2007)*, 13-16.

E. D. Demaine, M. L. Demaine, S. P. Fekete, M. Ishaque, E. Rafalin, R. T. Schweller, D. L. Souvaine. “Staged Self-Assembly: Nanomanufacture of Arbitrary Shapes with $O(1)$ Glues.” *Lecture Notes in Computer Science 4848: Proc. of the 13th International Meeting on DNA Computing (2007)*, Springer-Verlag.

* M. Ishaque, A. H. Levis, A. K. Zaidi. “Project Management Using Point Graphs.” *5th Conference on Systems Engineering Research, (2007)*.

M. Ishaque, A. H. Levis, A. K. Zaidi. “On Applying Point-Interval Logic to Criminal Forensics.” *Command and Control Research and Technology Symposium, (2006)*. Nominated for Best Student Paper award.

M. Ishaque, A. K. Zaidi. “Time-Sensitive Planning Using Point-Interval Logic.” *10th International Command and Control Research and Technology Symposium, (2005)*.

* represents “presented the paper”.

In Preparation

M. Ishaque, C. D. Tóth. “Relative Convex Hulls in Semi-Dynamic Arrangements.”

M. Ishaque, B. Speckmann, C. D. Tóth. “Shooting Permanent Rays Among Disjoint Polygons in the Plane.”

M. Al-Jubeh, M. Ishaque, and C. D. Tóth. “Data Structures for Approximate Convex Partitioning.”

References

Available on request.