Ali Vakilian

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Education:

- Massachusetts Institute of Technology, Cambridge, MA. September 2013 – present.
  PhD in Computer Science, CSAIL.
  Advisor: Erik Demaine
- University of Illinois at Urbana-Champaign(UIUC), September 2011 – August 2013.
  MS in Computer Science.
  Thesis Title: Prize-collecting Survivable Network Design Problem in Node-weighted Graphs
  Advisor: Chandra Chekuri
- Sharif University of Technology, Tehran, Iran, September 2007 – June 2011.
  BS in Computer Engineering.

Research Interests:

- Algorithm Design – Approximation Algorithms and Combinatorial Optimization
- Graph Theory and Combinatorics
- Computational Complexity and Hardness of Approximation

Awards and Honors:

- **Siebel Scholar**, Class of 2013. Awarded annually for academic excellence and demonstrated leadership to 85 top students from the world's leading graduate schools. **Siebel Scholar is the largest award offered by the College of Engineering at UIUC.**
- Recipient of the Grant for Undergraduate Studies from the **Iranian National Foundation of Elites**, awarded to selected members, September 2009 – September 2011.
- **3$^{\mathbf{rd}}$ highest** GPA among all computer engineering student (among about 150) from September 2007 until September 2010.
- Awarded the **Outstanding Student** certificate and prize by the president of Sharif University, 2008.
- Ranked **38$^{\mathbf{th}}$** in the annual nationwide universities entrance exam (Konkoor) over more than 300,000 participants, 2007.

Publications:

- **Cost Effective Schema Distortion**
  With Amir Nayyeri and Arash Termehchy. Manuscript, December 2013.
- **Connected Domatic Packing Node-capacitated Graphs**. Joint work with Alina Ene and Nitish Korula. Manuscript, July 2013.
- **Which Concepts Are Worth Extracting?**
  With Arash Termehchy, Yodsawalai Chodpathumwan and Marianne Winslett. SIGMOD 2014.
- **Improved Approximation Algorithms for Degree-bounded Network Design Problems with Node Connectivity Requirements**
  With Alina Ene. STOC 2014.
- **Prize-collecting Survivable Network Design in Node-weighted Graphs**
  With Chandra Chekuri and Alina Ene. APPROX 2012.
- **Node-weighted Network Design in Planar and Minor-closed Families of Graphs**
  With Chandra Chekuri and Alina Ene. ICALP 2012.

Research Experience:

- **Network Design Problems in Mixed-connectivity**. Joint work with Chandra Chekuri, UIUC, September 2012 – December 2013.
  We have considered a general notion of edge and node connectivities, (k, g)-connectivity, introduced by Frank. A pair of nodes s and t in G is (k, g)-connected if there exist k edge-disjoint st-paths in G such that each intermediate node appears in at most g of them. At this point, we have extended the known results for SNDP and min k-connected to this more general setting.
- **Automatic Pill Identification.** Summer internship project under the supervision of Minh N. Do and Jiangbo Lu, ADSC (Advanced Digital Sciences Center), Singapore, July 2010 – September 2010.
  We developed a system to identify a pill based on its image and the pill images in database. The ultimate goal of the project was to implement the application on cell phones to enable users identify the pills just by taking some photos. We designed and implemented the desktop version of the application. This project later got commercialized in Singapore.
- **Automatic Generation of Optimal Hardware Description Code for Processing Units** directed by H. Zarandi, July 2009 – March 2010.
  We developed an application, called "HodHod", that produced optimized hardware description code of a processing unit for a given input instruction set. HodHod implemented an algorithm for ordering RTL instructions optimally.

Presentations:

- Improved Approximation Algorithms for Degree-bounded Network Design Problems with Node Connectivity Requirements. **STOC 2014**.
- Approximation algorithms for Degree-bounded Network Design Problems. **Sharif UT, Dec'13**.
- Survivable Network Design in Node-weighted Graphs. **APPROX/RANDOM 2012**.
- Node-weighted Network Design in Planar and Minor-closed Families of Graphs. **UIUC, Feb'12**.
- Pill Identification, Poster session. **ADSC, Sep'10**.
- Introduction to Chordal Graphs. **Sharif UT, Nov'09**.

Skills:

- **Programming and Scripting**: C/C++, Java, LaTeX

Professional Activities:

- Organizer of the Algorithmic Graph Theory group, Sharif UT, November 2009 – January 2011.
- Orginizer of the UIUC theory seminar, Fall 2012.