Amirbehshad Shahrasbi

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shahrasbi.github.io

EDUCATION

Carnegie Mellon University *Aug 2015 - Sep 2020*
Ph.D. in Computer Science (ACO), Thesis: *Coding for Synchronization Errors* (Advisor: B. Haeupler)
M.Sc. in Algorithms, Combinatorics, and Optimization

Sharif University of Technology *Sep 2010 - Jul 2015*
B.Sc. in Computer Science, Thesis: *Critical Graphs in Index Coding* (Advisor: A. Gohari)
B.Sc. in Electrical Engineering (Digital Systems)

PROFESSIONAL EXPERIENCE

Harvard University, Post-Doctoral Fellow (Supervisor: Madhu Sudan) *Jan 2021 - present*
Supported through NSF-funded *CRA/CCC Computing Innovation Fellowship*

Microsoft Research, Intern, DNA Data Storage Group (Supervisor: Sergey Yekhanin) *Summer 2019*
Project: *Developing and implementing an enhanced trace reconstruction component for Microsoft's DNA data storage decoder by utilizing DNA sequencer's quality scores. We have applied for patent rights.*

Carnegie Mellon University, Research Assistant (Supervisor: Mor Harchol-Balter) *Fall 2015*
Project: *Caching algorithms for variable file sizes*

EPFL, Intern, Theory Group (Supervisor: Ola Svensson) *Summer 2014*
Project: *Approximation algorithms for k-capacitated facility location problem using linear programming*

PUBLICATIONS (Details available on my Google Scholar page)

- Synchronization Strings and Codes for Insertions and Deletions – a Survey[1]
  Haeupler and Shahrasbi, **Invited expository publication in IEEE Trans. on Inf. Theory**, 2021
- Optimally Resilient Codes for List-Decoding from Insertions and Deletions[1]
  Guruswami, Haeupler, and Shahrasbi, Symposium on Theory of Computing (**STOC**), 2020
- Near-Linear Time Insertion-Deletion Codes and (1+ε)-Approximating Edit Distance via Indexing[1]
  Haeupler, Rubinstein, and Shahrasbi, Symposium on Theory of Computing (**STOC**), 2019
- Synchronization Strings: Efficient and Fast Deterministic Constructions over Small Alphabets[1]
  Cheng, Haeupler, Li, Shahrasbi, and Wu, Symposium on Discrete Algorithms (**SODA**), 2019
- Synchronization Strings: Explicit Constructions, Local Decoding, and Applications[1]
  Haeupler and Shahrasbi, Symposium on Theory of Computing (**STOC**), 2018
- Synchronization Strings: List Decoding for Insertions and Deletions[1]
  Haeupler, Shahrasbi, and Sudan, Colloq. on Automata, Languages, and Programming (**ICALP**), 2018
- Synchronization Strings: Channel Simulations and Interactive Coding for Insertions and Deletions[1]
  Haeupler, Shahrasbi, and Vitercik, Colloq. on Automata, Languages, and Programming (**ICALP**), 2018
- Synchronization Strings: Codes for Insertions and Deletions Approaching the Singleton Bound[1]
  Haeupler and Shahrasbi, Symposium on Theory of Computing (**STOC**), 2017
  and *Journal of the ACM* (**JACM**), 2021
  Invited to the Theory of Computation (ToC) journal
- Critical Graphs in Index Coding
  Tahmasbi, Shahrasbi, and Gohari, IEEE International Symposium on Information Theory (**ISIT**), 2014
  and *IEEE Journal on Selected Areas in Communications* (**J-SAC**), 2015

UNPUBLISHED MANUSCRIPTS

- Rate-Distance Tradeoffs for List-Decodable Insertion-Deletion Codes[1]
  Haeupler and Shahrasbi, 2020

HONORS AND AWARDS

- Recipient of NSF-funded CRA/CCC Computing Innovations Postdoctoral Fellowship, 2020.
- **Invited speaker** at Highlights Session of *Symposium on Combinatorial Pattern Matching*, 2020.

[1]Authors' names appear in alphabetical order.

- **Invited to publish** an expository paper on synchronization strings in *Special Issue of the IEEE Transactions on Information Theory Honoring V. I. Levenshtein*, 2019.
- **Invited to publish** my paper on synchronization strings in the *Theory of Computing* journal, 2017.
- **Invited speaker** at *Harvard Workshop on Coding and Information Theory*, 2018.
- **Gold medalist** of 18^{th} Iranian National Olympiad in Informatics (INOI), 2009.
- Ranked 1^{st} among the 2015 computer science class, Sharif University of Technology, 2015.

U.S. PATENTS

Trace Reconstruction of Polymer Sequences Using Quality Scores, *filed by Microsoft Tech Licensing*, 2019.

INVITED TALKS

- Coding for Synchronization Errors, *Bar-Ilan University*, 2020.
- Synchronization Strings, *Information Theory and Applications Workshop*, 2020.
- Synchronization Strings, *Harvard Workshop on Coding and Information Theory*, 2018.
- Synchronization Strings: Communication in the Presence of Insertions and Deletions, *CMU*, 2018.
- Synchronization Strings, *Johns Hopkins University*, 2017.
- Synchronization Strings, *University of Maryland*, 2017.
- Analysis of Caching under Variable Object Sizes, *CMU*, 2015.
- LP-Based Approximation Algorithms for k-Capacitated Facility Location Problem, *EPFL*, 2014.
- Critical Graphs in Index Coding, *Sharif University of Technology*, 2014.

PEER REVIEW

- IEEE Symposium on Foundations of Computer Science (FOCS)
- ACM Symposium on Theory of Computing (STOC)
- ACM-SIAM Symposium on Discrete Algorithms (SODA)
- International Colloquium on Automata, Languages and Programming (ICALP)
- Innovations in Theoretical Computer Science (ITCS)
- European Symposia on Algorithms (ESA)
- SIAM Journal on Discrete Mathematics (SIDMA)
- IEEE Transactions on Information Theory (ITIT)
- IEEE Transactions on Communications (ITC)
- IEEE International Symposium on Information Theory (ISIT)

TEACHING EXPERIENCE

Teaching Assistant

CMU	Graduate Algorithms, Algorithms & Advanced Data Structures
Sharif	Advanced Programming, Designing Algorithms (2x), Introduction to Cryptography (2x), Introduction to Probability and Statistics, Logic Circuits and Digital Systems (2x)

Math/Programming Teacher *2009 - 2010*

I served as a math/programming teacher in IOI training programs in several Iranian high schools and Iranian National Olympiad in Informatics (INOI) training camp.

TECHNICAL SKILLS

Programming	C++ (Proficient), Pyhton, MATLAB (Familiar), Java, JS, PHP (Older Course Projects)
Tools & OS	Ubuntu (Moderate), Android SDK, Mathematica, OpenGL (Older Course Projects)

TECHNICAL PROJECTS

- Android Phone Tracking App [*Android SDK, Java*]
- Online Multi-player Checkers Game [*Java, JSP, Apache Tomcat*]
- Highly-Parallel Statistical Wildlife Simulation [*Java, RMI*]
- Design and Implementation of a GPS Car Tracking Device [*AVR micro-controller, C++, Altium*]
- Design and Implementation of a Maze Solver Robot [*ARM Cortex-M3, Keil µvision, C++*]

- Implementation of Reversi game on an Altera DE-2 Board [*Altera DE-2, C++*]
- Design and Implementation of a Room Mapping Robot [*AVR micro-controller, C++, Altium*]
- A Noise-Resilient Text Chat Device with Convolutional Codes [*AVR micro-controller, C++, Altium*]

REFERENCES

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