Mahed Abroshan
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Overview:

I am currently a postdoctoral researcher at Alan Turing Institute working on trustworthy machine learning and applying ML in healthcare. My strong background in mathematics (demonstrated in my dual undergraduate degree and my success in national and international mathematics competition) along with my extensive experience in information theory, equipped me well for the research in machine learning. I am passionate about problem solving and research on fundamental problems with real-life impact.

Employment

The Alan Turing Institute — London, UK
Postdoctoral Research Associate — *October 2019-Present*
Project: Learning machine for healthcare and criminal justice program
PIs: Prof. Sir Alan Wilson and Prof. Mihaela van der Schaar

University of Cambridge — Cambridge, UK
Postdoctoral researcher — *July 2019- March 2020*
Department of Applied Mathematics and Theoretical Physics
Project: Machine learning for healthcare
PI: Prof. Mihaela van der Schaar

Education

- **University of Cambridge, St. Edmund's College** — Cambridge, UK
  Ph.D. in Engineering — *Oct. 2015 – July 2019*
  Supervisors: Albert Guillén i Fàbregas and Ramji Venkataramanan
  Thesis: Insertion/Deletion Channels and File Synchronization Problem

- **Sharif University of Technology** — Tehran, Iran
  M.Sc. Communication systems — *Sept. 2013 – Aug. 2015*
  Thesis: Zero Error Coordination (Supervisor: Amin Gohari)
  GPA: 18.6/20

- **Sharif University of Technology** — Tehran, Iran
  B.Sc. Pure Mathematics (As the second major) — *Sept. 2010 – Jun. 2014*

- **Sharif University of Technology** — Tehran, Iran
  B.Sc. Electrical Engineering — *Sept. 2009 – Jun. 2013*
  Overall B.Sc. GPA: 18.09/20

Awards & Honors

- **Cambridge Trust** and **Trinity College-Henry Barlow Scholarships,** (2015-2019)
- **Third Prize** in International Mathematics Competition for university students **(IMC),** Bulgaria, July 2014
- **Departmental Scholarship** funded by European Research Council Grant**,** Department of Engineering, University of Cambridge (2015-2019)
- **Entering the M.Sc. program** as an exceptional talented student bypassing the entrance exam
- **Santander Mobility Grant** (June 2019) and **ISIT travel awards** (2017, 2018, and 2019)
- **Silver Medalist** in Iranian Mathematical Society Collegiate Competition, May 2014
- Grant for Undergraduate Studies **Iranian National Elite Foundation**, 2009 to 2015
- **Gold Medalist** of the Iranian National Mathematics Olympiad, 2008
- **Silver Medalist** of the Iranian National Mathematics Olympiad, 2007

Publications

Journal papers:

- **M. Abroshan**, K. Yip, C. Tekin, M. van der Schaar, **"Conservative Policy Construction Using Variational Autoencoders for Logged Data with Missing Values"** IEEE Transactions on Neural Networks and Learning Systems (2022)
- **M. Abroshan,** R. Venkataramanan, A. Guillén i Fàbregas, **"Multilayer Codes for Synchronization from Deletions and Insertions"** IEEE Transactions on Information Theory (2020)
- **M. Abroshan,** A. M. Alaa, O. Rayner, M. van der Schaar, **"Opportunities for machine learning to transform care for people with cystic fibrosis "** (editorial) Journal of Cystic Fibrosis (2020)
- **M. Abroshan,** R. Venkataramanan, A. Guillén i Fàbregas, **"Coding for Segmented Edit Channels"** IEEE Transactions on Information Theory (2018)

Conference papers:

- **(Under review) M. Abroshan,** S. Mishra, M.M. Khalili, **"A Memetic algorithm for Interpreting Black-boxes Using Primitive Functions"**
- **(Under review)** M.M. Khalili, X. Zhang, **M. Abroshan,** I. Vakilinia, **"Non-convex Optimization for Learning a Fair Predictor under Equalized Loss Fairness Constraint"**
- **(Accepted) M. Abroshan*,** G. Aminian*, M.M. Khalili, M. Rodrigues, **"A Theoretical-Inspired Method for Semi-supervised Learning under Covariate-shift"**, AISTAT 2022
  (* equal contribution)
- M.M. Khalili, X. Zhang, **M. Abroshan**, "**Fair Sequential Selection Using Supervised Learning Models**" Advances in Neural Information Processing Systems, Neurips 2021

- M.M. Khalili, X. Zhang, **M. Abroshan**, S. Sojoudi, **"Improving Fairness and Privacy in Selection Problems"** Association for the Advancement of Artificial Intelligence AAAI 2021

- **M. Abroshan**, R. Venkataramanan, L. Dolecek, A. Guillén i Fàbregas, "**Coding for Deletion Channels with Multiple Traces**" IEEE International Symposium on Information Theory 2019

- **M. Abroshan,** R. Venkataramanan, A. Guillén i Fàbregas, **"Efficient Systematic Encoding of Non-Binary VT codes"** IEEE International Symposium on Information Theory 2018

- **M. Abroshan**, R. Venkataramanan, A. Guillén i Fàbregas, **"Codes for Channels with Segmented Edit"** IEEE International Symposium on Information Theory 2017

- **M. Abroshan,** R. Venkataramanan, A. Guillén i Fàbregas, **"Multilayer Codes for Synchronization from Deletions"** IEEE Information Theory Workshop 2017, http://arxiv.org/abs/1705.06670

- **M. Abroshan**, A. A. Gohari, S. Jaggi, **''Zero Error Coordination"** IEEE Information Theory Workshop 2015, https://arxiv.org/pdf/1505.01110v1.pdf

Research visits and Internships

- **Multiple deletion channels with application in DNA storage**
  Research visit to Department of Electrical Engineering, University of California Los Angeles (UCLA), hosted by Prof. Lara Dolecek (June - July 2018). One paper published.

- **Codes for Deletion channels**
  Research visits and collaboration with information theory and coding group at UPF Barcelona, Spring 2016.

- **Coordination Problem in Networks**
  Internship at Institute of Network Coding, Chinese University of Hong Kong (CUHK), hosted by Prof. Sidharth Jaggi (Feb 2014 – Jul 2015). One paper published.

Teaching Experience

- Supervising **Inference**, University of Cambridge**,** Lent term 2018
- Supervising **Signals and Systems**, University of Cambridge**,** Michaelmas 2017
- Supervising **Information Theory and Coding**, U of Cambridge**,** Michaelmas 2016 and 2017
- Demonstrating **Data Transmission Lab**, University of Cambridge**,** Lent 2016,17,18
- Teaching Assistant for **Probability and Statistics**, Sharif University of Technology, Fall 2014
- Teaching **Geometry** for Preparation of National Mathematics Olympiad Team, Fall 2010
- Teaching **Combinatorics and Graph Theory** in Allameh Amini High School, Fall 2010

Programming skills

- Python (pytorch, tensorflow, sklearn), MATLAB, C++

References

- **Dr. Albert Guillén i Fàbregas**
  Department of Engineering, University of Cambridge, Email: guillen@ieee.org

- **Dr. Ramji Venkataramanan**
  Department of Engineering, University of Cambridge, Email: ramji.v@eng.cam.ac.uk

- **Professor Sir Alan Wilson**
  Director of Special Projects, Alan Turing Institute, and honorary professor at UCL, Email: awilson@turing.ac.uk