

Mostafa Karimi

Curriculum Vitae

Education

- 2020 **Ph.D Program in Electrical Engineering**, *Texas A&M University*.
 - Overall GPA: 4.0/4.0
- 2019 **M.E in Electrical Engineering**, *Texas A&M University*.
 - Overall GPA: 4.0/4.0
- 2015 **B.S. Computer Science**, *Sharif University of Technology*.
- 2015 **B.S. Electrical Engineering**, *Sharif University of Technology*.
- 2010 **Diploma in Mathematics and Physics**.
National Organization for Development of Exceptional Talents (NODET)

Work Experience

- 2020–present **Data and applied scientist**, *Microsoft*.
Develop and implement novel machine learning models for speech research team.
- Summer 2019 **Data scientist PhD Intern**, *Ancestry.com*.
Develop and implement **GANs and optimal transport** for document preprocessing and classical computer vision techniques for layout analysis which is submitted to **US patent** and accepted in **CVPR 2020 workshop**
- Summer 2018 **Data scientist PhD Intern**, *Anadarko Petroleum Company (APC)*.
Develop and implement **deep learning** models for image/video segmentation for 3D seismic images which was accepted in **NeurIPS 2018 workshop**.

Academic Experience

- 2015–2020 **Graduate Research Assistant**, *Genomic Signal Processing Laboratory and Center for Bioinformatics and Genomic Systems Engineering*, Texas A&M University.
- 2012–2015 **Undergraduate Research Assistant**, *Advanced Communication Research Institute (ACRI)*, Sharif University of Technology.
- 2010–2015 **Member of Talented Student**, *Sharif University Technology*.

Research Interest

- Optimization theory and machine learning
- NLP and speech processing
- Deep Learning
- Computational Biology and Drug discovery

Redmond, WA, USA

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Awards

- March 2021 Recipient of the **Association of Former students Distinguished Graduate Student Award** for Excellence in Research-Doctoral, Texas A&M University.
- Dec 2020 Our paper, [de novo protein design through gcWGAN](#) featured as **cover** of Journal of Chemical Information and Modeling. .
- Dec 2019 Received **NIH-funded** travel fellowships to present at the [CAGI* Workshop](#) in San Francisco.
- May 2019 Our paper [Genomic and Molecular Landscape of DNA Damage Repair Deficiency Across The Cancer Genome Atlas](#) has been selected among **best of 2018 Cell Reports**.
- May 2019 Our paper on [pH-specific antibody-drug conjugate](#) featured as **TAMU research bulletin news**.
- Aug 2016 Received [NSF award for young professionals contributing to smart and connected health](#) at 2016 IEEE EMBS annual conference.
- 2015-2017 Awarded **Graduate Research Assistantship** from Texas A&M AgriLIFE Research, Center for Bioinformatics and Genomic Systems Engineering.
- 2010 Ranked 46th among more than 450,000 participants in the national Undergraduate University Entrance Exam.
- 2010-2015 Recipient of the **5-year grant** for undergraduate studies from **National Elites Foundation** of IRAN, awarded to selected members.
- Jan 2013 [Awarded to Participate in Winter School ITCSC-INC 2013](#), The Chinese University of Hong Kong (CUHK), Hong Kong.

Patents

- 2020 **M. Karimi**, G. Veni, Y. Yu, "Illegible Text to Readable Text: An Image-to-Image Transformation", US Patent Application 17/065,763

Reviewer

- IEEE Transactions on Computational Biology and Bioinformatics (TCBB)
- BMC Bioinformatics
- IEEE Transactions on Circuits and Systems for Video Technology (TCSVT)
- IIE Transactions on Healthcare Systems Engineering
- ACM-BCB 2020
- ISMB/ECCB 2021

Publication

- 2021 **M. Karimi***, D. Wu*, Z. Wang and Y. Shen, "Explainable Deep Relational Networks for Predicting Compound-Protein Affinities and Contacts", **Journal of Chemical Information and Modeling** 61 (1), 46-66

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- 2020 **M. Karimi**, G. Veni, Y. Yu, "Illegible Text to Readable Text: An Image-to-Image Transformation using Conditional Sliced Wasserstein Adversarial Networks", Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition **CVPR Workshops** 2020, pp. 552-553.
- 2020 K. Afrin*, A. Iquebal*, **M. Karimi***, A. Larsen*, S. Lee* and B. Mallick, "Directionally Dependent Multi-View Clustering Using Copula Model", **Plos One** 15(10): e0238996
- 2020 **M. Karimi***, S. Zhu*, Y. Cao*, and Y. Shen, "De Novo Protein Design of Novel Folds using Guided Conditional Generative Adversarial Networks (gcWGAN)", **Journal of Chemical Information and Modeling** 60 (12), 5667-5681
- 2020 **M. Karimi***, A. Hassanizadeh*, and Y. Shen, " Network-principled deep generative models for designing drug combinations as graph sets", accepted in **ISMB 2020** and published in **Bioinformatics** 36, i445-i454
- 2019 Y. Cao, Y. Sun, **M. Karimi**, H. Chen, O. Moronfoye, and Y. Shen, "Predicting Pathogenicity of Missense Variants with Weakly Supervised Regression", **Human Mutation** 40 (9), 1579-1592
- 2019 C. Savojardo, et al, "Evaluating the predictions of the protein stability change upon single amino acid substitutions for the FXN CAGI5 challenge", **Human Mutation** 40 (9), 1392-1399
- 2019 J. Kang , W. Sun , P. Khare , **M. Karimi** , X. Wang , Y. Shen , R. Ober, E. Ward "Engineering antibody-receptor interactions to generate higher potency antibody-drug conjugates", **Nature Biotechnology** 37 (5), 523
- 2019 **M. Karimi**, D. Wu, Z. Wang and Y. Shen, "DeepAffinity: Interpretable Deep Learning of Compound-Protein Affinity through Unified Recurrent and Convolutional Neural Networks", **Bioinformatics** 35 (18), 3329-3338
- 2019 MP Menden, et al, "Community assessment to advance computational prediction of cancer drug combinations in a pharmacogenomic screen", **Nature Communication** 10 (1), 2674
- 2018 **M. Karimi**, and Y. Shen, "Interconnected Cost Function Networks (iCFN): an exact algorithm for multistate protein design with substate ensembles", accepted in **ECCB 2018** and published in **Bioinformatics** 34 (17), i811-i820
- 2018 S. Fanning, et al, "The SERM/SERD Bazedoxifene Disrupts ESR1 Helix 12 to Overcome Acquired Hormone Resistance in Breast Cancer Cells", **eLife** 7, e37161
- 2018 T. Knijnenburg, et al, "Genomic and Molecular Landscape of DNA Damage Repair Deficiency Across The Cancer Genome Atlas", **Cell Reports** 23(1), 239-254. e6
- 2017 **M. Karimi**, and Y. Shen, "Anticipating Cancer Mutations through Combinatorial Protein Design", **Proceedings of the Eighteenth Yale Workshop on Adaptive and Learning Systems**, Center for Systems Science, Department of Electrical Engineering, Yale University, pp. 19-24, June 2017
- 2016 M. Azghani, **M. Karimi**, and F. Marvasti, "multi-hypothesis compressed video sensing technique", **IEEE transactions on circuits and systems for video technology(TCSVT)**, vol. 26, no. 4, April 2016

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Selected courses

- **Machine learning:** Deep Learning: Theory and application, Machine Learning with Network, Pattern Recognition, Probabilistic Graphical Modeling, Reinforcement learning
- **Optimization:** Linear programming, Integer programming, convex optimization
- **Algorithm:** Analysis of Algorithm, Data Structure, Advanced Programming
- **Math & Statistics:** Information theory, Game theory, Statistical Inference, Advanced Bayesian Modeling and Computation, Matrix Computation, Signal processing under uncertainty

Presentations

- 2020 **M. Karimi***, A. Hassanizadeh*, and Y. Shen, "Network-principled deep generative models for designing drug combinations as graph sets", oral talk at **ECEN Bio-seminar at Texas A&M university**, August 28, 2020, College Station, TX.
- 2020 **M. Karimi***, A. Hassanizadeh*, and Y. Shen, "Network-principled deep generative models for designing drug combinations as graph sets", oral talk at **ISMB 2020**, July 16, Virtual presentation.
- 2019 **M. Karimi*** and Y. Shen, "iCFN: an efficient exact algorithm for multistate protein design", poster presented at **CAGI* workshop**, Dec. 6, 2019, San Francisco, CA, USA.
- 2018 **M. Karimi**, and Y. Shen, "Interconnected Cost Function Networks (iCFN): an exact algorithm for multistate protein design", poster presentation at **Modeling of Protein Interaction (MPI)**, Nov 8, 2018, Lawrence, KS, USA.
- 2018 **M. Karimi**, and Y. Shen, "Deep affinity: interpretable deep learning of compound-protein affinity through unified recurrent and convolutional neural networks", poster presentation at **Winedale Workshop**, Oct 19, 2018, Winedale, TX, USA.
- 2018 **M. Karimi**, and Y. Shen, "Deep affinity: interpretable deep learning of compound-protein affinity through unified recurrent and convolutional neural networks", poster presentation at **Bioinformatics and Cancer Symposium**, Sep 21, 2018, College Station, TX, USA.
- 2018 **M. Karimi**, and Y. Shen, "Unraveling and anticipating cancer missense mutations through computational protein design", poster presentation at **TAMU DNA Day**, April 24, 2018, College Station, TX, USA.
- 2016 **M. Karimi**, and Y. Shen, "Interconnected Cost Function Networks (iCFN): an exact algorithm for multistate protein design", poster presentation at **ENG-LIFE**, April 14, 2017, College Station, TX, USA.
- 2016 **M. Karimi**, and Y. Shen, "Multiscale Computational Tools for Antibiotic Resistance Big Data: Patterns, Mechanisms, and Personalized Therapeutics", invited talk at **38th IEEE EMBC 2016 for NSF Award** for Young Professionals Contributing to Smart and Connected Health, August 20, 2016, Orlando, FL, USA.

Skills

- Programming Languages: C/C++, Java, R, Bash Scripting, Python, Perl, Matlab
- Deep learning softwares: Tensorflow, Keras, Pytorch
- Other computer skills: AWS, PyMOL, CHARMM, Git, Latex, Microsoft Office

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