

Reza Abbasi-Asl

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ACADEMIC AFFILIATIONS

- Yu Group, University of California Berkeley, CA, US
- Berkeley Artificial Intelligence Research Laboratory (BAIR), CA, US
- Berkeley Laboratory of Information and System Sciences (BLISS), CA, US
- Center for Science of Information (CSoI), NSF Science and Technology Center

RESEARCH INTERESTS

- Statistical Modeling, Data Analysis & Machine Learning
- Vision Science, Visual Perception & Computational Neuroscience
- Artificial Intelligence and Computer Vision
- Biomedical Signal Processing & Image Analysis

EDUCATION

University of California, Berkeley, CA, USA
PhD., Electrical Engineering and Computer Sciences, **Sep 2013 - Present**
Designated Emphasis in Communication, Computation and Statistics
• Advisor: Prof. Bin Yu

Sharif University of Technology, Tehran, Iran
M.Sc., Biomedical Engineering (Bioelectrics), GPA: 18.35 / 20 **Sep 2010 - Jan 2013**
• Thesis Topic: *Feature-Based Local Registration of Brain MR Images*
• Advisor: Prof. Emad Fatemizadeh

Tehran Polytechnic (Amirkabir University of Technology), Tehran, Iran
B.Sc., Electrical Engineering (Telecommunication), GPA: 18.24 / 20 **Sep 2006 - Sep 2010**
• Advisor: Prof. Abbas Mohammadi
B.Sc., Electrical Engineering (Electronics), GPA: 18.18 / 20 **Sep 2006 - Sep 2010**
• Advisor: Prof. Abbas Mohammadi

National Organization for Development of Exceptional Talents, Tabriz, Iran
Pre-University Diploma, Mathematics and Physics, GPA: 19.25 / 20 **Sep 2005 - Sep 2006**

VISITING POSITIONS

Simons Institute for the Theory of Computing, Berkeley, CA, US
Long-Term Visiting Scholar **Jan 2015 - May 2015**

PROFESSIONAL EXPERIENCE

Yu Group, University of California, Berkeley, CA.
Graduate Student Researcher
Mentor: Bin Yu **Sep 2013-Present**

- Explaining functionality of neurons in V4 area of the brain using deep nets.
(*Collaborators: Yuansi Chen, Adam Bloniarz, Michael Oliver, Jack L. Gallant*)
- Explaining human brain fMRI responses to natural movies using 3D spatio-temporal networks.
- Compression of deep convolutional neural networks.

Neuralink, San Francisco, CA.
Summer Intern **May 2017-Aug 2017**

Simons Center for Data Analysis, Simons Foundation, New York, NY.
Summer Research Associate
Mentor: Dmitri B. Chklovskii **May 2015-Aug 2015**

- Analysis of retinal ganglion cell responses to natural movies.
(*Collaborators: Cengiz Pehlevan and Bin Yu*)

Biomedical Signal and Image Processing Laboratory (BiSIPL)

Sharif University of Technology, Tehran, Iran

Research Assistant

Mentor: Emad Fatemizadeh

Sep 2010-Sep 2013

- Feature-based Non-rigid Image Registration
- Multi-resolution Image Processing Using Bidimensional Empirical Mode Decomposition
- Muscle Force Estimation from Electromyography Signals
- Estimation of Formal Neural Information Using Hammerstein-Wiener Model
- Point-based Image registration using Unscented Kalman Filter
- EIT Image Reconstruction based on Unscented Kalman Filter
- Chromosome Identification based on Image Processing Approaches
- Wind Speed Prediction Using Hammerstein Wiener Model
- Shape-based classification of Images using Radon Transform

Agfa Healthcare, Tehran, Iran

Technical Director Assistant

Mentor: Ahmad Noori

Sep 2011- Sep 2013

- Technical Expert of MR, CT and Radiology Digitizers and Printers

PUBLICATIONS

- **R. Abbasi-Asl** and B. Yu. Structural Compression of Convolutional Neural Networks Based on Greedy Filter Pruning, *arXiv preprint*, 2017.
- **R. Abbasi-Asl**, C. Pehlevan, B. Yu and D. B. Chklovskii. Do retinal ganglion cells project natural scenes to their principal subspace and whiten them? *Proceedings of 50th Asilomar Conference on Signals, Systems and Computers*, Pacific Grove, CA, 2016.
- A. Ahadi, H. Hayati, J. Mitra, **R. Abbasi-Asl**, K. Awodele. A new method for estimating the longevity and degradation of photovoltaic systems considering weather states. *Frontiers in Energy*. 2016; 10 (3) :277 - 285.
- **R. Abbasi-Asl**, R. Khorsandi, B. Vosooghi Vahdat. Hammerstein-Wiener Model: A New Approach to the Estimation of Formal Neural Information. *Basic and Clinical Neuroscience*. 2012; 3 (4) :45-51.
- **R. Abbasi-Asl**, Y. M. Marghi, B. Vosoughi-Vahdat. Estimation of Formal Neural Information Using Hammerstein-Wiener Model. In: *IEEE Proceedings of The 16th CSI Symposium on Artificial Intelligence and Signal Processing (AISP2012)*, Iran, 2012.
- A. Ghanbari, **R. Abbasi-Asl**, A. Ghaffari, E. Fatemizadeh. Automatic B-spline Image Registration Using Histogram-based Landmark Extraction. In: *2012 IEEE-EMBS Conference on Biomedical Engineering & Sciences*.
- **R. Abbasi-Asl**, E. Fatemizadeh. MMRO: A Feature Selection Criterion for MR Images Based on Alpha Stable Filter Responses. In: *IEEE Proceedings of 7th Iranian Conference on Machine Vision and Image Processing (MVIP2011)*, Iran, 2011. (**Best Paper Finalist**)
- **R. Abbasi-Asl**, R. Khorsandi, Sh. Farzampour, E. Zahedi. Estimation of Muscle Force with EMG Signals Using Hammerstein-Wiener Model. In: *IFMBE Proceedings 5th Kuala Lumpur International Conference on Biomedical Engineering (BIOMED2011)*, Malaysia, Vol. 35, pp. 157-160, 2011.
- S. Abadpour, **R. Abbasi-Asl**, Gh. Moradi. Analysis of Push-Push Oscillators and Designing a Push-Push Oscillator in S Band. In: *IEEE Proceedings of 10th Mediterranean Microwave Symposium (MMS2010)*, Turkey, 2010.

CONFERENCE ABSTRACTS

- **R. Abbasi-Asl**, Y. Chen, A. Bloniarz, M. Oliver, J. L. Gallant and B. Yu. Deep Nets Meet Real Neurons: Pattern Selectivity in V4, *8th International Workshop on Statistical Analysis of Neuronal Data (SAND8)*, Pittsburgh, PA, 2017. (Accepted abstract and poster presentation)
- **R. Abbasi-Asl**, Y. Chen, A. Bloniarz, J. L. Gallant and B. Yu. Artificial Neurons Meet Real Neurons: Pattern Selectivity In V4, *INFORMS Annual Meeting*, Nashville, TN, 2016. (Invited)

oral presentation)

- **R. Abbasi-Asl**, Y. Chen, A. Bloniarz, J. Mairal, J. L. Gallant and B. Yu. Explaining V4 Neurons Pattern Selectivity via Convolutional Neural Network, *7th International Workshop on Statistical Analysis of Neuronal Data (SAND7)*, Pittsburgh, PA, 2015. (Accepted abstract and poster presentation)
- **R. Abbasi-Asl**, R. Khorsandi, N. Mozaffari, Sh. Farzampour. A Novel Model for Estimation of the Forearm Motor Forces Using EMG Signals. In: *Proceedings of The 1st International Congress of Neuromuscular and Electrodiagnostic Medicine*, Iran, 2011. (Accepted abstract and poster presentation)

POSTER
PRESENTATIONS

- **R. Abbasi-Asl**, Feature Representation for Modeling Visual Cortex Area V4: Dictionary Learning vs. Deep Convolutional Networks, *Berkeley Statistics Annual Research Symposium (BSTARS)*, Berkeley, US, 2015. (Poster presentation and thunder talk)
- **R. Abbasi-Asl**, A. Bloniarz, J. Mairal, J. L. Gallant and B. Yu. Higher-level Representations of Natural Images and Movies for Modeling Extrastriate Visual Cortex Regions, *Center for Science of Information Summer School on Information in Neural Systems and Life Sciences*, UCSD, San Diego, US, 2014. (Poster presentation)
- **R. Abbasi-Asl**, Y. Chen, A. Bloniarz, J. Mairal, J. L. Gallant and B. Yu. Feature Representation for Modeling Visual Cortex Area V4: Dictionary Learning vs. Deep Convolutional Networks, *Center for Science of Information NSF site visit*, Purdue University, West Lafayette, US, 2014. (Poster presentation)
- Y. Chen, **R. Abbasi-Asl**, A. Bloniarz, J. Mairal, J. L. Gallant and B. Yu. Invariant Modeling of Visual Cortex Area V4 based on Scattering Transform: Interpretation and Visualization, *Center for Science of Information NSF site visit*, Purdue University, West Lafayette, US, 2014. (Poster presentation)
- A. Bloniarz, Y. Chen, **R. Abbasi-Asl**, J. Mairal, J. L. Gallant and B. Yu. Comparing image representations for modeling of the visual cortex. In: *Center for Science of Information NSF site visit*, Purdue University, West Lafayette, US, 2014. (Poster presentation)

HONORS &
AWARDS

- Travel Award Winner of The Seventh International Workshop on Statistical Analysis of Neural Data (SAND7), Pittsburgh, PA. **2015**
- **UC Berkeley** Departmental Full Financial Support Award **2013**
- **Best Paper Finalist** in 7th Iranian Conference on Machine Vision and Image Processing (MVIP 2011)
- **Excellence Award** in Biomedical Engineering (@ Sharif University of Technology) and Electrical Engineering (@ Amirkabir University of Technology) **2010, 2007**
- Semi-finalist of National Physics Olympiads and Chemistry Olympiads, Iran **2004**
- Member of National Organization for Development of Exceptional Talents **1999-2006**

TEACHING
EXPERIENCE

University of California, Berkeley, CA, USA

Graduate Student Instructor

- EE 120: Signals and Systems Spring 2016 & Spring 2017
- EE 20: Structure and Interpretation of Systems and Signals Spring 2015

Sharif University of Technology, Tehran, Iran

Teaching Assistant

- Medical Imaging Systems Fall 2012
- Introduction to Biomedical Engineering Fall 2012
- Biomedical Image Analysis and Processing Spring 2012
- Neural Modeling Spring 2012

Laboratory Supervisor

- Analog Circuits

Spring 2011

Tehran Polytechnics (Amirkabir University of Technology), Tehran, Iran

Teaching Assistant

- Engineering Mathematics (2 sections) Fall 2010
- Probability and Statistics (2 sections) Spring 2010
- Electromagnetics Fall 2009
- Fundamental of Electrical Engineering Fall 2009

SELECTED
GRADUATE
COURSEWORK

University of California, Berkeley, CA, US

Statistical Learning Theory, Statistical Models: Theory and Application, Topics in Deep Learning, Visual Cognitive Neuroscience, Stochastic Systems: Estimation and Control, Theoretical Statistics

Sharif University of Technology, Tehran, Iran

Sparsity and Blind Source Separation, Advanced Biomedical Signal Processing, Medical Imaging Systems, Numerical Optimization, Biomedical Image Analysis and Processing, Neural Modeling

ACADEMIC
SERVICES

- **Invited Reviewer** for the Innovations in Theoretical Computer Science Conference, IEEE Symposium on Computers & Informatics, IEEE Conference on Control, Systems & Industrial Informatics, IEEE Business Engineering and Industrial Applications Colloquium, IEEE Colloquium on Humanities, Science and Engineering,
- IEEE Iran section, Student Branch of Tehran Polytechnics
Chairman of publicity committee Sep 2009-Sep 2010
- 2nd AUT Electrical Engineering Week, Communication and Electronics conference
Chairman of scientific committee Nov 2009

MEMBERSHIPS

- IEEE Brain Community** 2016
- American Statistical Association (ASA)** 2014
- Institute of Mathematical Statistics (IMS)** 2014
- Institute for Electrical and Electronics Engineers (IEEE)**
- Student Member* 2008-2010, 2014
- IEEE Signal Processing Society Member 2009-2010, 2014
- IEEE Information Theory Society Memeber 2014
- IEEE Computational Intelligence Society Member 2014
- IEEE Communication Society (ComSoc) Member 2009-2010
- Iranian Society of Machine Vision and Image Processing** 2010-2013

SKILLS

Computer Skills

- Python, MATLAB, R, C/C++, Octave, Bash Scripting
- Experience using machine learning toolboxes (Caffe, TensorFlow)
- OS X, Linux, Windows, Vim, L^AT_EX, Microsoft Office.

Languages

- English (fluent)
- Persian (native)
- Azerbaijani (native)

HOBBIES

Photography

- Check it out at: eecs.berkeley.edu/~abbasi/photography

REFERENCES

available upon request