Mostafa Ghorbandoost

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Education

- **M.Sc. in Electrical Engineering, Communication Systems** Sep. 2011 – Oct. 2013
  School of Electrical Engineering, Amirkabir University of Technology *Tehran, Iran*
  - **Thesis**: Reducing the Number of Training Sentences in Parallel Voice Conversion ...
- **B.Sc. in Electrical Engineering, Electronics** Sep. 2007 – Sep. 2011
  School of Electrical Engineering, Amirkabir University of Technology *Tehran, Iran*
  - **Thesis**: Design and Implementation of a 10 Mbps Modulator

Experience

- **Machine Learning Researcher** Sep. 2017 - Present
  MAPNA Group *Karaj, Iran*
  - **Representation Learning**: Used probabilistic methods to obtain meaningful and disentangled representations of power plant's high dimensional sensor data for visualization and further processing
  - **Variational Inference**: Elaborated variational and reparameterization techniques to train modern deep probabilistic autoencoders to model high dimensional data
  - **Anomaly Detection**: Utilized Variational AutoEncoders to distinguish normal behavior of a power plant from its faulty behavior to prevent unpredictable breakdowns
  - **Anomaly Generation**: Designed an anomaly generation system based on Variational AutoEncoders and used it to evaluate anomaly detection and fault classification models
  - **Domain Adaptation**: Employed Domain Adversarial Neural Networks and Domain Invariant Variational AutoEncoders to adapt trained models to work with new plants
- **Natural Language Processing Researcher** May. 2017 - Sep. 2017
  NueMD (Remote) *Tehran, Iran*
  - **Multi-label Text Classification**: Used Long Short-Term Memory (LSTM) networks and deep learning techniques to classify medical texts for Automated Medical Coding task
  - **Word Embedding**: Trained Skip-Gram and CBOW embeddings on thousands of medical texts to better suit the medical applications than pre-trained word2vecs
- **Digital Designer** Oct. 2016 - May. 2017
  FANA. Co. *Tehran, Iran*
  - **Forward Error Correction**: Implemented Reed-Solomon error correction for Optical Transform Network to enhances the effective range of transmission using Verilog and Altera Stratix-V FPGAs
- **Machine Learning Practitioner** Mar. 2016 - Oct. 2016
  Freelancing *Tehran, Iran*
  - **Human Gesture Recognition**: Classified sequences of 12 gestures captured through Microsoft Kinect using left-to-right Hidden Markov Models with high accuracy
  - **Speaker Verification**: Authenticated the identity of a person through his voice using speech spectral features and Universal Background Model which is a particular type of GMM
- **Machine Learning Researcher** Sep. 2012 - Jan. 2015
  Multimedia Signal Processing Research Lab at Amirkabir University of Technology *Tehran, Iran*
  - **Voice Conversion**: Used a variety of probabilistic and Bayesian regression techniques to change a speaker's identity to mimic another speaker without changing the language contents of his utterances
  - **Mixture Density Networks**: Employed a variety of mixture models from Gaussian Mixture Regression to Mixture Density Networks to better capture the multi-modal nature of speech signal while doing regression
  - **Dynamic Bayesian Networks**: Deployed dynamic linear Gaussian models (Inference by Kalman filtering) as a powerful form of DBNs to model sequential relationships in speech and convert it without loss of continuity
  - **Ensemble Learning**: Alleviated the high variance problem (over-fitting) of regression with a low amount of training data (only 10 utterances) using Random Forest without loss of converted speech quality
  - **Speech Analysis/Synthesis**: Extracted and modified low-dimensional representative features (MFCC, LSF, MCC) from high-dimensional speech spectrum for the voice conversion task

Awards and Honors

- **Ranked 168 among 90,000 Data Scientists** — Oct. 2020
  Data Science Q&A website; User name: pythinker — *Stack Exchange*
- **Winner of Bronze Medal** — Sep. 2006
  National Physics Olympiad — *Tehran, Iran*

Professional Training

- **Power Plant Performance Efficiency & Optimization** — Feb. 2020
  Merim Engineering Consulting L.L.C — *Dubai, UAE*
- **Python for Data Science course** — Dec. 2018
  Laitec Training Center — *Tehran, Iran*
- **Linux LPIC1 course** — June. 2018
  Anisa Training Center — *Tehran, Iran*

Software Skills

Main Operating Systems	Programming Languages	Documentation tools	Vesrion Control
Linux / MS Windows	Python / MATLAB	LaTeX / Markdown	Git / GitHub

Deep Learning Libraries	Machine Learning Libraries	Data Science Libraries	Plotting Libraries
TensorFlow / Keras	Scikit-learn / Stats-models	Pandas / Numpy	Matplotlib / Plotly

Journal publications

[1] **Mostafa Ghorbandoost**, Valiallah Saba, "Non-parallel training for voice conversion using background-based alignment of GMMs and INCA algorithm", IET Signal Processing 11.8, pp. 998-1005. **IEEE**, 2017. link

[2] **Mostafa Ghorbandoost**, Abolghasem Sayadiyan, Mohsen Ahangar, Hamid Sheikhzadeh, Abdoreza Sabzi Shahrebabaki, Jamal Amini, "Voice conversion based on feature combination with limited training data", Speech Communication 67, pp. 113-128. **Elsevier**, 2015. link

Conference Proceedings

[1] Mohsen Ahangar, **Mostafa Ghorbandoost**, Sudhendu Sharma, Mark JT Smith, "Voice conversion based on a mixture density network", IEEE Workshop on Applications of Signal Processing to Audio and Acoustics, New Paltz, NY, **USA**, 2017. link

[2] Mohsen Ahangar, **Mostafa Ghorbandoost**, Hamid Sheikhzadeh, Kaamran Raahemifar, Abdoreza Sabzi Shahrebabaki, Jamal Amini, "Voice conversion based on state space model and considering global variance", IEEE International Symposium on Signal Processing and Information Technology, Athens, **Greece**, 2013. link

[3] Abdoreza Sabzi Shahrebabaki, Jamal Amini, Hamid Sheikhzadeh, **Mostafa Ghorbandoost**, Neda Faraji, "Reduced Search Space Frame Alignment Based on Kullback-Leibler Divergence for Voice Conversion", International Conference on Nonlinear Speech Processing, Mons, **Belgium**, 2013. link