

## Bahram Vazir Nezhad

### Work history

- Visiting Academic- University of Sydney (June 2015-)
- Faculty member- Assistant professor- Sharif University of Technology (Since May 2010)
  - Department of Computational Linguistics
  - Research Center for Biomedical Engineering and Health Systems
  - Speech and Language Processing Lab
  - Social Robotics Lab, Center of Excellence in Design, Robotics, and Automation
- Research fellow- Research Center for Intelligent Signal Processing (July 2008-April 2010)
- Research fellow- University of Sydney (Oct 2007-Jun 2008)
  - Information Technologies Department, Health Information Technologies Research Laboratory

### Contact

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### Education

- Ph.D. in Electrical Engineering– Biomedical Eng., (2008), Amirkabir University of Technology (polytechnic of Tehran), Dissertation: "Phonetic pronunciation variation modeling to generate a dynamic adaptive lexicon in continuous speech recognition systems"
- M.Sc. in Biomedical Engineering, (2003), Amirkabir University of Technology (polytechnic of Tehran), Thesis: "Modeling pronunciation variants in continuous speech recognition systems"
- B.Sc. in Biomedical Engineering, (2000), National University (Shahid Beheshti Medical University)

### Research interests

- Natural language processing, Statistical Natural Language Processing, Computational Linguistics, Cognitive Science
- Machine learning, pattern recognition, Artificial intelligence
- Speech processing, speech recognition, speech synthesis, speech enhancement, speech coding, speaker identification, pathologic speech processing
- Health informatics, medical text mining, medical ontology
- Biomedical signal processing, biomedical instruments, biosensors, chaotic signal processing

## Positions

- Visiting Academic and Casual Lecturer at University of Sydney, 2015
- Co-founder of the 1<sup>st</sup> Computational Linguistics Department in Iran in Sharif University of Technology, 2010.
- Co-founder of the 1<sup>st</sup> Computational Linguistics MSc program in Iran in Sharif University of Technology, 2010.
- Deputy for Research and Graduate Studies in Languages and Linguistics Center, Sharif University of Technology, Since Sep. 2011
- Head of Computational Linguistics Department, Sharif University of Technology, Since Feb. 2010
- Co-founder and Head of Speech and Language Processing Lab, Department of Computational Linguistics, Sharif University of Technology, Since Feb. 2010
- Member of Social Robotics Lab, Center of Excellence in Design, Robotics, and Automation, Sharif University of Technology, Since Sep. 2013.
- Manager for Industrial relations in Languages and Linguistics Center, Sharif University of Technology, Since Sep. 2013.
- Supervisor of Speech Processing Center, Tele-Com Research Centre, from Sep. 2009 to Sep. 2013.
- Lecturer, Azad University, Science and Research Branch, Biomedical Eng. Department, 2005-2006

## Courses Taught

- University of Sydney
  - Data Analytics (2015)
- Sharif University of Technology
  - Natural Language Processing (Fall semester, 2012-now)
  - Statistical Methods in Natural Language Processing (Spring semester, 2011-now)
  - Speech Processing (Spring 2014)
  - Artificial Intelligence and Knowledge Engineering (Spring 2014)
  - Programming with Python (Fall 2010)
  - Mathematics for Computational Linguistics (Fall semester, 2010-2011)
  - Technical English for Electrical and Computer Engineering (Fall 2010-now)
- Research and Science Campus, Azad University
  - Electronics Laboratory (Ten groups, 2005-2006)
  - General Mathematics (Two groups, 2005-2006)
  - Prerequisite Mathematics (Two groups- 2005-2006)

## Thesis Supervised

- [1] Omid Rohanian, A System for Converting Visual Data to Linguistic Description based on Machine Learning and Computer Vision Algorithms, From Oct 2014.
- [2] Sima Rezaei, Consonant Perception Evaluation in Listeners: The Effects of Phonological Distinctive Features and the Context, From Oct 2014.
- [3] Kamran Ghaffari, Modelling Pronunciation Variations in Persian Conversational Speech, From Oct 2014.
- [4] Ehsan Saffari, Speaker Localization in Noisy Environments: Design and Implementation of a Robot Auditory System, From Oct 2014.
- [5] Sareh Sadeghi, Design of an Extractive Summarization System based on Cognitive Processes of Human Mind for Text Perception, From Oct 2012 to Jan 2014.
- [6] Basira Khaki, Utilizing Latent Topic Models for Persian Document Classification, From Oct 2012 to Jan 2014.
- [7] Afshin Rahimi, Sonority Sequencing Principle in Persian Phonotactics and its role in Robust Speech Perception, From Oct 2011 to Jan 2013.
- [8] Mehdi Moradi, Commonsense Knowledge Extraction for Persian Language: A Combinatory Approach, From Oct 2011 to Jan 2013.
- [9] Hadi Abdi Ghavidel, Automatic Detection and Disambiguation of Metaphorical and Metonymic Concepts, From Oct 2011 to Jan 2013.
- [10] Vahid Mavaji, Designing and Implementing a Morphological Analyzer for Persian Language, From Oct 2011 to Jun 2012.

## Selected funded research projects

- [1] "Extracting mental models, individual or a team, through cognitive-linguistics processing of text and speech" Speech and Language Processing Laboratory, Sharif University of Technology, 2015.
- [2] "Estimation of interference chance in politicians' mental models by identification of personality through cognitive-linguistics processing of text and speech" Speech and Language Processing Laboratory, Sharif University of Technology, 2015.
- [3] "Design and implementation of a text comprehension and summarization system inspired by human mind" Speech and Language Processing Laboratory, Sharif University of Technology, 2015.
- [4] "Implementing speech quality and intelligibility assessment methods and related databases for Persian language", Speech and Language Processing Laboratory, Sharif University of Technology, 2013.
- [5] "Phonetic pronunciation variation modeling to generate a dynamic adaptive lexicon in continuous speech recognition systems and conversational speech synthesis systems", Speech and Language Processing Laboratory, Sharif University of Technology, 2011.
- [6] "Speech enhancement module in wireless communication system", Speech and Language Processing Laboratory, Sharif University of Technology, 2009-2010.
- [7] "Speech activity detection in handheld wireless radios", Tele-Com research center, Tehran, 2009-2010.

- [8] "Conversational Persian speech synthesizer based on unit-selection method", Tele-Com research centre, Tehran, 2009-2010.
- [9] "Developing a text independent speaker identification system over various channels", Research Center for Intelligent Signal Processing (RCISP), Tehran, 2008-2009.
- [10] "Mapping medical query to ontology as an infra-structure for natural language processing for clinical text", University of Sydney, School of Information Technologies, sabbatical leave, 2007- 2008.
- [11] "Developing a generic Thesaurus, Terminology, Ontology and Classification (TTOC) web-based browser for medical TTOCs including SNOMED CT, Apache, NIC and NOC", University of Sydney, School of Information Technologies, sabbatical leave, 2007- 2008.
- [12] "Developing a word spotting system in spontaneous telephony speech", Research Center for Intelligent Signal Processing (RCISP), Tehran, 2006- 2007.
- [13] "Development of SHENAVA, a Persian Continuous Speech Recognizer-pronunciation variation modeling in the lexicon", Amirkabir University of Technology (AUT) and Research Center of Intelligent Signal Processing (RCISP), Tehran, 2001-2006.
- [14] "Automatic detection of human voice disorders by processing of sustained vowels", Joint research project by Research Center for Intelligent Signal Processing (RCISP) and Tehran University, 2003- 2004.

#### Journal papers

- [1] Moradi, M., Vazirnezhad, B., Bahrani, M., Commonsense knowledge extraction for Persian language: A combinatory approach, Journal of information processing and management, 2015.
- [2] Sadeghi, S., Vazirnezhad, B., Extractive summarization based on cognitive aspects of human mind for narrative text, Journal of signal and data processing, 2015.
- [3] Vazirnezhad, B., Soltanzadeh, F., Mahdavi, M. M., Moradi, M., Sharif text editor: A Persian editor and spell checker system, Journal of signal and data processing, 2015.
- [4] Soltanzadeh. F., Kowsarifard. Z., Vazirnezhad, B., Design of an automatic medical question answering system, Journal of signal and data processing, 2015.
- [5] Rahimi, A., Vazirnezhad, B., Eslami, M., Sonority distribution in consonant clusters in syllable boundary in Persian, Journal of Language Research, 2015.
- [6] Rahimi, A., Vazirnezhad, B., Eslami, M., P-Analysis: Dispersion and neutralization of acoustic cognitive cues in Persian lexicon, Advances in Cognitive Science, Vol.16, No. 2, 2014.
- [7] Rahimi, A., Vazirnezhad, B., Eslami, M., Sonority sequencing principle in Persian, Journal of signal and data processing, Vol. 11, No.1, 2014.
- [8] Ramazani, N., Oskoei, H. R. D., Vazirnezhad, B., Proposing wireless network security by joint physical security and signcryption scheme, Journal of Information Security Research, Vol. 4, No. 4, 195-204, Dec. 2013.

- [9] Mavaji, V., Eslami, M., Vazirnezhad, B., Pars Morph: A persian morphological analyzer, *Journal of Signal and Data Processing*, Vol. 15, Issue 1, 2012.
- [10] Shafiee, S., Almasganj, F., Vazirnezhad, B., Jafari, A., 2010. A two stage speech activity detection system considering fractal aspects of prosody, *Journal of pattern recognition letters*, Vol. 31, 936-948. (ISI-Elsevier- science direct)
- [11] Vazirnezhad, B., Almasganj, F., Ahadi, S. M., 2009. Hybrid statistical pronunciation models designed to be trained by a medium-size corpus, *Computer Speech and Language*, Vol. 23, Issue 1, 1-24, [doi:10.1016/j.csl.2008.02.001]. (ISI- Elsevier- science direct)
- [12] Vazirnezhad, B., Almasganj, F., Ahadi, S. M., 2009, Speaker adapted dynamic lexicons containing phonetic deviations of words. *Journal of Zhejiang University*, Vol. 10, Issue 10, 1461-1475, [doi:10.1631/jzus.A0820761]. (ISI- Springer)
- [13] Patrick, J., Wang, Y., Budd, P., Rector, A., Brandt, S., Rogers, J., Herkes, R., Ryan, A., Vazirnezhad, B., 2009, Developing SNOMED CT subsets from clinical notes for intensive care service. *Health Care and Informatics Review*, published online. (ISI)
- [14] Vazirnezhad, B., Almasganj, F., 2007. Hybrid statistical static and dynamic models to generate pronunciation variants of words, *Journal of Computer Science and Engineering*, Vol. 5, Issue 1-a, 28-40.
- [15] Vazirnezhad, B., Moradi, M. H., 2006. Evaluation of discriminative features extracted from sustained vowel to classify normal and pathological speech, *Journal of Signal and Data Processing*, Vol. 2, Issue 8, 71-80.
- [16] Vazirnezhad, B., Almasganj, F., Bijankhan, M., 2005. Automatic extraction of contextual rules and generating phonetic variants of words to be used in automatic continuous speech recognition, *Journal of Computer Science and Engineering*, Vol. 3, Issue 3-a, 23-30.

#### Conference papers

- [1] Saffari, E., Meghdari, A., Vazirnezhad, B., Alemi, M., AVA- a social robot: Design and implementation of a robotic hearing apparatus, *International Conference on Social Robotics (ICSR)*, Paris, Oct. 2015.
- [2] Saffari, E., Meghdari, A., Vazirnezhad, B., Alemi, M., Speaker localization in noisy environments: design and implementation of a robotic hearing apparatus, *3<sup>rd</sup> international conference on Robotics and Mechatronics (IEEE-ICROM)*, Tehran, Oct. 2015.
- [3] Rohanian, M., Vazirnezhad, B., Rohanian, M., Sharif Spam corpus: A spam filter dataset for the Persian language, *IEEE 10<sup>th</sup> International Conference on Information Technology and Applications*, Sydney, Jul. 2015.
- [4] Soltanzadeh, F., Kowsarifard, Z., Vazirnezhad, B., Automatic medical question answering system for Persian, *IEEE 10<sup>th</sup> International Conference on Information Technology and Applications*, Sydney, Jul. 2015.

- [5] Rohanian, M., Ghafari, K. M., Vazirnezhad, B., Designing a morphological analyzer for Persian using a two-level morphology model, In proc. of the 3<sup>rd</sup> computational linguistics conference, Tehran, Nov. 2014.
- [6] Rahimi, A., Vazirnezhad, B., Eslami, M., P-trac procedure: The dispersion and neutralization of contrasts in lexicon, In proc. of the global conference on linguistics and foreign language teaching, Antalya, Dec. 2013.
- [7] Rahimi, A., Eslami, M., Vazirnezhad, B., It is not all downhill from here: syllable contact law in Persian, In proc. of the global conference on linguistics and foreign language teaching, Antalya, Dec. 2013.
- [8] Soltanzadeh, F., Vazirnezhad, B., A system for automatic spell correction for Persian text in the web, In proc. of the 1<sup>st</sup> congress of Persian language and the web, Tehran, Sep. 2013.
- [9] Darmian, N. R., Oskoei, H., Vazirnezhad, B., Proposing a hybrid protocol for secure wireless networks based on signcryption scheme, In proc. of IEEE-computer and information technology, Sousse, Tunisia, June 2013.
- [10] Khaki, B., Gili, M., Vazirnezhad, B., Ghavidel, H. A., Improving the performance of a POS tagger system considering inflectional and derivational operations, In proc. of the 5<sup>th</sup> information and knowledge technology conference (IKT), Shiraz, June 2013.
- [11] Ghavidel, H. A., Vazirnezhad, B., Bahrani, M., Moradi M., A hybrid classifier for persian documents, In proc. of the 4th information and knowledge technology conference (IKT), Babol, 2012.
- [12] Moradi M., Vazirnezhad, B., Khosravizadeh, P., Abdi Ghavidel, H., Extracting generic sentences from Persian Wikipedia, In proc. of the 4th information and knowledge technology conference (IKT), Babol, 2012.
- [13] Farsinejad, A., Vazirnezhad, B., Persian POS tagger enhanced with knowledge of language, In proc. of the 4th information and knowledge technology conference (IKT), Babol, 2012.
- [14] Rahimi, A., Vazirnezhad, B., Eslami, M., Sonority sequencing in consonant cluster of syllable contact in Persian, In proc. of the 2<sup>nd</sup> computational linguistics conference, Tehran, Nov. 2012.
- [15] Ghavidel, H. A., Bahrani, M., Vazirnezhad, B., Automatic Detection and Disambiguation of Metaphorical and Metonymic Concepts, In proc. of the 2<sup>nd</sup> computational linguistics conference, Tehran, Nov. 2012.
- [16] Moradi, M., Vazirnezhad, B., Web as a corpus: Developing a labeled corpus from the web, In proc. of the 2<sup>nd</sup> computational linguistics conference, Tehran, Nov. 2012.
- [17] Patrick, J., Vazirnezhad, B., Budd, P., Wang, Y., Cheng, Y., The generic clinical ontology viewer. In proc. of the 17<sup>th</sup> Iranian conference on electrical engineering (ICEE2009), Tehran, 2009.
- [18] Patrick, J., Wang, Y., Budd, P., Rector, A., Brandt, S., Rogers, J., Herkes, R., Ryan, A., Vazirnezhad, B., Developing classification subsets from clinical notes for intensive care service. In proc. of the 7<sup>th</sup> annual conference & exhibition of Health Informatics New Zealand (HINZ), Rotorua, New Zealand, 2008.
- [19] Patrick, J., Wang, Y., Vazirnezhad, B., Rector, A., Grade, S., Rogers, J., Herkes, R., Ryan, A., Inductive inference of a SNOMED CT subset for intensive care

- services. In proc. of the 3<sup>rd</sup> International Conference on Knowledge Representation in Medicine (KR-MED), p. 122, Phoenix, Arizona, US, 2008.
- [20] Vazirnezhad, B., Almasganj, F., Bijankhan, M., A hybrid statistical model to generate pronunciation variants of words. In proc. of IEEE- Natural Language Processing and Knowledge Engineering (IEEE NLP-KE), pp. 106- 110, Wuhan, 2005.
- [21] Vazirnezhad, B., Seyed Salehi, S. A., Almasganj, F., Modeling pronunciation variation in automatic speech recognizers using artificial neural networks. In proc. of the 2<sup>nd</sup> information and knowledge technology conference (IKT), Tehran, 2005.
- [22] Vazirnezhad, B., Moradi, M. H., Evaluation of three features based on short-time fractal dimension and formant specifications for automatic differentiation between normal and pathologic speech. In proc. of the 2<sup>nd</sup> information and knowledge technology conference (IKT), Tehran, 2005.
- [23] Vazirnezhad, B., Moradi, M. H., Automatic detection of human voice disorders by processing of speech, In Proc. of 13<sup>th</sup> International Conference in Electrical Engineering (ICEE), Zanjan, 2005.
- [24] Vazirnezhad, B., Almasganj, F., Bijankhan, M., Modeling pronunciation variants of words by contextual rules in a Persian continuous speech recognition system. In proc. of the 1<sup>st</sup> information and knowledge technology conference (IKT), pp. 137-145, Tehran, 2003.

#### Major Conferences, workshops, visits attended

- IEEE- Information Technologies and Applications, Sydney, Australia, July-2015
- Arab Health Medical Exhibition, Dubai, UAE, Jan-2015
- Arab Health Medical Exhibition, Dubai, UAE, Jan-2014
- IEEE Conference on Computers and Information Technologies, Susse, Tunisia, Jun-2013
- Technical workshop about ICU and point-of-care instruments such as Blood gas analyzers, Antalya, Turkey, May-2013
- Arab Health Medical Exhibition, Dubai, UAE, Jan-2013
- Seminar about point-of-care instruments, Dubai, UAE, Nov-2012
- Arab Health Medical Exhibition, Dubai, UAE, Jan-2012
- World Diabetes Congress, Dubai, UAE, Dec-2011
- Arab Health Medical Exhibition, Dubai, UAE, Jan-2011
- Technical workshop on Connectivity of analyzers to Hospital Information System, presented by US company Nova Biomedical, Kuala Lumpur, Malaysia, Jul-2010
- 17<sup>th</sup> conference on electrical engineering (ICEE2009), Tehran, 2009
- University of Sydney, Health Information Technologies Research Laboratory, Sydney, Australia, Nov-2007 to May-2008, research fellow
- Technical training workshop on Analogue to DICOM image convertor systems, Dubai, UAE, Jan-2006
- Technical training workshop on blood gas systems and critical care analyzers, presented by Nova Biomedical US based company, Vienna, Austria, Oct-2005

- 2<sup>nd</sup> Information and Knowledge Technology conference (IKT2005), Tehran, 2005
- 13<sup>th</sup> International Conference in Electrical Engineering (ICEE2005), Zanjan, 2005
- 1<sup>st</sup> Information and Knowledge Technology conference (IKT2003), Tehran 2003

#### Awards and honors

- Member of Iran National Foundation of Elites (2009)
- Rank 1 in PhD studies, graduated with excellent grade (2008)
- Rank 1 in PhD admission exam out of 20 students enrolled (2002)
- Rank 135 in MSc admission exam out of 25,000 students enrolled (2000)
- Rank 148 in unified state University admission exams out of 1,300,000 students enrolled (1996)
- First rank in higher school education (1996)

#### Computer skills

- Programming languages: C++/ python/ MATLAB/ SQL/ MySQL/ html/ java script/AJAX
- Web programming technologies: CGI/ php
- Operating systems: Windows (all versions)/ Android
- Other software: M.S. Office/Adobe Photoshop/Cool Edit Pro

#### Language skills

- Persian (Farsi)- native
- English- speak, read and write with high proficiency  
IELTS: listening (7.5)/ reading (7)/ writing (7)/ speaking (7.5)/ band score (7.5)
- Arabic- basic competence

#### Professional references

- Prof. Jon David Patrick, Professor of Computer Engineering, Chairs of Language Technology and Information Systems at the Sydney University, email: [jonpat@healthll.com.au](mailto:jonpat@healthll.com.au)
- Prof. Ali Meghdari, Professor of Robotics, former Vice President of Academic Affairs and Head of the Center of Excellence in Design, Robotics and Automation and at Sharif University of Technology, email: [meghdari@sharif.edu](mailto:meghdari@sharif.edu)
- Prof. Hossein Sameti, Professor of Computer Engineering, Head of Computer Engineering Department and Director of Speech Processing Research Group at Sharif University of Technology, email: [sameti@sharif.edu](mailto:sameti@sharif.edu)