

Ing. Jan Trmal Ph.D.

CONTACT INFORMATION	Associate Research Scientist Center for Speech and Language Processing The Johns Hopkins University Hackerman Hall 226 3400 N Charles Street Baltimore, MD 21218	<i>Mobile:</i> +15402331604 <i>E-mail:</i> jtrmal@gmail.com <i>WWW:</i> Faculty page
RESEARCH INTERESTS	Automatic speech recognition, voice technologies: distributed algorithms, neural networks, acoustic modeling, high performance computing, parallel computation, GPU programming, distributed speech processing, distributed systems design, speech compression	
ACADEMIC APPOINTMENTS	Associate Research Scientist CLSP, Johns Hopkins University, – co-PI, DARPA AIDA Program – PI, NSF CRI Kaldi (PI since January 2018) – DARPA LORELEI Program	June 2017 to present
	Assistant Research Scientist CLSP, Johns Hopkins University, – co-PI, IARPA BABEL Program – DARPA LORELEI Program – NSF CRI Kaldi	June 2015 to June 2017
	Postdoctoral Researcher CLSP, Johns Hopkins University, – SCALE 2015 Workshop Pashto STT and MT system developer – DARPA BOLT Program – IARPA BABEL Program – Postdoctoral Mentor: Sanjeev Khudanpur • The recipe for language independent training • The keyword search accuracy optimization	September 2012 to June 2015
EDUCATION	The University of West Bohemia, Plzen, Czech Republic	
	Ph.D., Department of Cybernetics, December 2012 • Thesis Topic: <i>Spatio-temporal structure of feature vectors in neural network adaptation</i> • Adviser: Doc. Ing. Müller Luděk, Ph.D. • Area of Study: Artificial Intelligence, Speech Recognition	
	Ing. (M.S. equiv.), Department of Cybernetics, July 2004 • Thesis Topic: <i>Speech Signal Transport in Data Networks</i> • Awarded by the Dean's Award for Excellence • Area of Study: Speech & Voice Compression	
ACADEMIC EXPERIENCE	Students Advisor , Masters & Doctoral Degree • Bachelor & Masters degree students • Matthew Wiesner – co-advisor since July 2016 • Chunxi Liu – co-advisor, since July 2016	
	Teaching Experience , Department of Cybernetics, The University of West Bohemia • Instructor, Algorithms and Programming in Cybernetic (KKY/APK) • Instructor, Internet Technologies (KKY/ITE) • Teaching Assistant, Control Theory (KKY/TR)	

ACADEMIC
SERVICE

Reviewer Service,

- ETRI Journal, ISSN 1225-6463
- Text, Speech and Dialogue. *Lecture Notes in Artificial Intelligence*, ISBN 978-3-642-23537-5
- Interspeech, Int. Conf
- Speech Communication Journal, ISSN 0167-6393
- PLOS ONE.

Co-Organizer of the 2018 Frederick Jelinek Memorial Summer Workshop in Baltimore

Recent contributor to several open-source software projects, including:

- Kaldi toolkit
 - 499 commits, 213k added lines, 32k deleted lines.
 - Code reviews for external contributors
 - Contributed recipes for Babel data (25 languages), Iban, fixes to several others.
 - Maintainer of the Windows build pipeline.
 - Keyword-search pipeline developer and maintainer.
- OpenSLR repository
 - Technical maintainer
- OpenFST for Windows

Tutorial: Building Speech Recognition Systems With the Kaldi Toolkit. Co-author. Presented at:

- SLTU-2016. The 5th International Workshop on Spoken Language Technologies for Under-resourced Languages.
- The Johns Hopkins University Applied Physics Laboratory, 2016
- IARPA Babel final system delivery and government transition workshop 2017
- Presentation for JHU/CLSP students 2017

PAST
PROFESSIONAL
EXPERIENCE

The University of West Bohemia, Plzen, Czech Republics

Research Specialist

2004 to 2013

- Participation on following research projects
 - “Elimination of the language barriers faced by the handicapped watchers of the Czech Television” (grant # [2C06020](#))
 - “Elimination of the language barriers faced by the handicapped watchers of the Czech Television II” (grant # [TA01011264](#))
 - “Integrated center for natural language processing” (grant # [LC536](#))
 - “Multimodal human sign language and speech processing for man-machine communication” (grant # [1ET101470416](#))
- Developed new approaches to acoustic modeling for speech recognition
- Developed large-scale captioning system for production use in the Czech Television (public service broadcaster in the Czech Republic)

SpeechTech s.r.o., Plzen, Czech Republic

R&D Intern for Speech Codecs Reverse Engineering

2003 – 2005

- Developed an optimized SW implementation of standard codecs
- Performed compliance tests of the implementation and cross-compliance tests with third-party DSP implementation
- Reverse engineering of codecs with no available public specification

Research Specialist

2005 – 2013

- Participated on research and application projects

- Technical support and maintenance of HW and SW

Spolek Juristic o.s., Nonprofit Charitable Organization

Server Administrator, HW & SW Maintenance

2001 – 2009

- Performed regular server maintenance
- Chief information security officer

GRANTS

- [1] co-PI, “*DARPA Active Interpretation of Disparate Alternatives (AIDA)*,” PI Benjamin Van Durme, DARPA Award No. HR001117S0026-AIDA-FP-013.
- [2] PI (since January 2018), “*NSF CI-EN: Enhancements for the Kaldi Speech Recognition Toolkit*,” National Science Foundation Award No. 1513128.
- [3] Co-PI, “*Baseline STT Systems and KWS Tools to Support BABEL Program Objectives and Evaluation Processes*,” PI Sanjeev Khudanpur, IARPA BABEL Contract No 2012-12050800010, Option Period 3: 12/01/2015 – 11/30/2016
- [4] PI, “*Spoken term detection and speech recognition for low-resource languages*,” TG-IRI130013 NSF XSEDE, October 1, 2013 – September 30, 2014.

REFEREED JOURNAL PUBLICATIONS

- [5] R. Hippmann, T. Dostálová, J. Zvárová, M. Nagy, M. Seydlová, P. Hanzlíček, P. Kříž, L. Šmídl, J. Trmal “Voice-supported Electronic Health Record for Temporomandibular Joint Disorders.” *Methods of Information in Medicine*. 2010 (Vol. 49): Issue 2, 2010, pages 168–172
doi:10.3414/ME9301
- [6] Vaněk J., Trmal J., Psutka J. V., and Psutka J. “Optimized Acoustic Likelihoods Computation for NVIDIA and ATI/AMD Graphics Processors.” *IEEE Transactions on Audio, Speech and Language Processing*. 2012 (Vol 20): Issue 6, 2012, 1818 – 1828
doi:10.1109/TASL.2012.2190928

SELECTED CONFERENCE PUBLICATIONS

- [1] Liu at al. Topic Identification for Speech without ASR. *Interspeech 2017*. (accepted)
- [2] Švec at al. A relevance score estimation for spoken term detection based on RNN-generated pronunciation embeddings. *Interspeech 2017*. (accepted)
- [3] Trmal at al. The Kaldi OpenKWS System: Improving Low Resource Keyword Search. *Interspeech 2017*. (accepted)
- [4] Hannemann at al. Bayesian Sequence Models for Grapheme-to-Phoneme Conversion. *Proceedings of Int. Conf ICASSP 2017*. 2017.
- [5] Burget at al. Building Speech Recognition System from Untranscribed Data. *Technical Report of the 2016 Third Frederick Jelinek Memorial Summer Workshop*
- [6] Chodroff et al. New release of Mixer-6: Improved validity for phonetic study of speaker variation and identification. In: *Proceedings of the Tenth International Conference on Language Resources and Evaluation (LREC 2016)*. 2016. p. 1323-1327.
- [7] Kumar et al. A Coarse-Grained Model for Optimal Coupling of ASR and SMT Systems for Speech Translation. *EMNLP 2015*. 2015. p. 1902–1907

- [8] Trmal et al. “A Keyword Search System using Open Source Software”. *Proceeding of Int. Conf. SLT 2014*.
- [9] Liu et al. “Low-Resource Open Vocabulary Keyword Search Using Point Process Models”. *Proceedings of Int. Conf Interspeech 2014*.
- [10] Chiu et al. “Combination of FST and CN search in spoken term detection”. *Proceedings of Int. Conf Interspeech 2014*.
- [11] Zhang et al. “Improving deep neural network acoustic models using generalized maxout networks”. *Proceedings of Int. Conf ICASSP 2014*.
- [12] Chleborad et al. “Evaluation of voice-based data entry to an electronic health record system for dentistry”. In: *Biocybernetics and Biomedical Engineering* 33/4, 2013, pp. 204–210
- [13] Chen et al. “Using Proxies for OOV Keywords in the Keyword Search Task”. *Automatic Speech Recognition and Understanding (ASRU), 2013 IEEE Workshop on*. 2013, pp. 416–421
- [14] Chen et al. “Quantifying the Value of Pronunciation Lexicons for Keyword Search in Low Resource Languages”. *Proceedings of Int. Conf. ICASSP 2013*.
- [15] J. Trmal et al. “Adaptation of a Feedforward Artificial Neural Network Using a Linear Transform.” In: Text, Speech and Dialogue. *Lecture Notes in Computer Science* 6231 (2010), pp. 423–430.
- [16] J. Trmal et al. “Online TV captioning of Czech Parliamentary Sessions”. In: Text, Speech and Dialogue. Vol. 6231. *Lecture Notes in Computer Science*. Springer Berlin / Heidelberg, 2010, pp. 416–422.
- [17] J. Trmal et al. “On Speaker Adaptive Training of Artificial Neural Networks.” *Proceedings of Int. Conf. Interspeech 2010*, 2010.
- [18] J. Trmal et al. “Feature Space Transforms for Czech Sign-Language Recognition.” *Proceedings of Int. Conf. Interspeech 2008*.
- [19] J. Trmal et al. “Independent components for acoustic modeling.” *Proceedings of Int. Conf. Interspeech 2006*, 2006, pp. 2486–2489. ISSN: 1990-9772. GPU.” *Proceedings of Int. Conf. Interspeech 2006*.

REFERENCES
AVAILABLE TO
CONTACT

Sanjeev Khudanpur

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- Associate Professor, Department of Electrical and Computer Engineering
- Associate Professor, Department of Computer Science (secondary appointment)
- ★ *Sanjeev Khudanpur was my postdoctoral mentor at the Johns Hopkins University*

Florian Metze

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phone: +1 (412) 268-8984

- Associate Research Professor, School of Computer Science Language Technologies Institute (LTI)

Josef Psutka

e-mail: psutka@kky.zcu.cz;

phone: +420 377 63 2500

- Professor, Department of Cybernetics
The University of West Bohemia

★ *Josef Psutka is the head of the Department of Cybernetics & PI of the Elimination of the Language Barriers research projects*

Luděk Müller

e-mail: muller@kky.zcu.cz;

phone: +420 377 63 2523

- Coordinator - Artificial Intelligence Section, Department of Cybernetics
The University of West Bohemia

- Executive Head, SpeechTech s.r.o.

★ *Luděk Müller was my PhD thesis advisor & my advisor of my work for the SpeechTech s.r.o.*

MORE
INFORMATION

More information and the full list of publications can be found at
<https://scholar.google.cz/citations?user=7iTo6ggAAAAJ>.