

RESEARCH INTERESTS

Automatic speech and speaker recognition: normalization of noise, channel, and speech variation mismatch; robust front-ends; online feature equalization; acoustic models for varying environments; limited resource speech recognition. Speech analysis: cognitive load/emotion/talking style assessment; longitudinal characteristics of speech production; statistical modeling of prosody.

EDUCATION

- JULY 2008 Ph.D. in ELECTRICAL ENGINEERING AND INFORMATION TECHNOLOGY
Czech Technical University, Prague
 Dissertation: "Robust Speech Recognition: Analysis and Equalization of Lombard Effect in Czech Corpora"
- MARCH 2003 M.S. in ELECTRICAL ENGINEERING
Czech Technical University, Prague
 Master's Thesis: "Guitar MIDI Converter"

RESEARCH & WORK EXPERIENCE

- | | |
|----------------|---|
| <i>Current</i> | RESEARCH ASSOCIATE |
| AUG 2007 | Center for Robust Speech Systems
Erik Jonsson School of Engineering and Computer Science
The University of Texas at Dallas |
| AUG 2007 | GRADUATE RESEARCH ASSISTANT |
| MARCH 2003 | Speech Processing Group
Department of Circuit Theory
Faculty of Electrical Engineering
Czech Technical University in Prague |

AWARDS

- JAN-SEPT 2006 PRINCIPAL INVESTIGATOR (PI), "Normalization of Lombard Effect", Siemens Corporate Technology (Munich, Germany), (€10,000)
- 2006 POSTER'06 – 10th International Student Conference on Electrical Engineering, Prague – Paper Award
- 2005 INTERSPEECH'05 Student Travel Grant (ISCA)
- 2005 COMPREHENSIVE DOCTORAL EXAMINATION – Passed with Honors

PROFESSIONAL SERVICE – EXTERNAL REVIEWER

Reviews of 22 journal articles, conference and workshop papers, and books.
 JOURNAL OF THE ACOUSTICAL SOCIETY OF AMERICA (JASA)
 EURASIP JOURNAL ON AUDIO, SPEECH, AND MUSIC PROCESSING

IEEE INTERNATIONAL CONFERENCES ON ACOUSTICS, SPEECH, AND SIGNAL PROCESSING (ICASSP)
IEEE WORKSHOPS ON AUTOMATIC SPEECH RECOGNITION AND UNDERSTANDING (ASRU)
BOOK REVIEWS: Machac, P. & Skarnitzl, R. (2009), Principles of Phonetic Segmentation, Eponcha Publishing, Prague

PROFESSIONAL AFFILIATIONS (CURRENT/PAST)

IEEE – current

INTERNATIONAL SPEECH COMMUNICATION ASSOCIATION (ISCA) – current

EUROPEAN ASSOCIATION FOR SIGNAL PROCESSING (EURASIP) – 2004–2005

EUROPEAN CENTER OF EXCELLENCE IN SPEECH SYNTHESIS (ECESS) – 2006

TEACHING EXPERIENCE

- | | |
|-----------|---|
| 2008–2009 | COURSE SUPPORT
Erik Jonsson School of Engineering and Computer Science
The University of Texas at Dallas
Course: EE6366 Speech and Speaker Recognition |
| 2005–2007 | COURSE DEVELOPMENT/INSTRUCTOR
Institute of Phonetics
Charles University in Prague
Course: Matlab Fundamentals |
| 2003–2007 | INSTRUCTOR
Faculty of Electrical Engineering
Czech Technical University in Prague
Courses: Circuit Theory I, Circuit Theory II, Electrical Circuits, Fundamentals of Electronic Circuits, Electrical Engineering for Informatics, Electrical Circuits in Communications |

PUBLICATIONS

PAPERS IN REVIEW PROCESS

1. J. H. L. Hansen, E. Ruzanski, **H. Bořil**, and J. Meyerhoff, “Stress assessment in speech using TEO based hybrid classification and tracking schemes: A case study,” *submitted to IEEE Transactions on Audio, Speech, and Language Processing*, 2010.
2. T. Hasan, **H. Bořil**, A. Sangwan, J. H. L. Hansen, “A multimodal highlights generation scheme for sports,” *submitted to IEEE Workshop on Spoken Language Technology (SLT 2010)*, Berkeley, California, December 2010.

JOURNAL ARTICLES

3. **H. Bořil** and J. H. L. Hansen, “Unsupervised equalization of Lombard effect for speech recognition in noisy adverse environments,” *IEEE Transactions on Audio, Speech, and Language Processing*, 18(6), August 2010, pp. 1379–1393.
4. **H. Bořil** and P. Fousek, “Influence of different speech representations and HMM training strategies on ASR performance,” *Acta Polytechnica, Journal on Advanced Engineering*, 46(6), 2007, pp. 32–35.

5. **H. Bořil**, A. Sangwan, T. Hasan, and J. H. L. Hansen, “Automatic excitement-level detection for sports highlights generation,” *accepted to INTERSPEECH’10*, Tokyo, Japan, September 2010.
6. **H. Bořil**, O. Sadjadi, T. Kleinschmidt, and J. H. L. Hansen, “Analysis and detection of cognitive load and frustration in drivers’ Speech,” *accepted to INTERSPEECH’10*, Tokyo, Japan, September 2010.
7. A. Sulyman, **H. Bořil**, A. Sangwan, and J. H. L. Hansen, “Limited resource speech recognition for Nigerian English,” in *Proc of IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP’10)*, Dallas, TX, March 2010, pp. 5090–5093.
8. M. Mehrabani, **H. Bořil**, and J. H. L. Hansen, “Dialect distance assessment method based on comparison of pitch pattern statistical models,” in *Proc. of IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP’10)*, Dallas, TX, March 2010, pp. 5158–5161.
9. T. Kleinschmidt, P. Boyraz, **H. Bořil**, S. Sridharan, and J. H. L. Hansen, “Assessment of speech dialog systems using multi-modal cognitive load analysis and driving performance metrics,” in *Proc. of IEEE International Conference on Vehicular Electronics and Safety (ICVES’09)*, Pune, India, November 2009, pp. 167–172.
10. **H. Bořil** and J. H. L. Hansen, “Reduced complexity equalization of Lombard effect for speech recognition in noisy adverse environments,” in *Proc. of Interspeech’09*, Brighton, UK, September 2009, pp. 1243–1246.
11. **H. Bořil**, P. Boyraz, and J. H. L. Hansen, “Towards multi-modal driver’s stress detection,” in *Proc. of 4th Biennial Workshop on Digital Signal Processing for In-Vehicle Systems and Safety*, Dallas, TX, 2009, 9 pages.
12. **H. Bořil**, N. Krishnamurthy, and J. H. L. Hansen, “Online noise and Lombard effect compensation for in-vehicle automatic speech recognition,” in *Proc. of 4th Biennial Workshop on Digital Signal Processing for In-Vehicle Systems and Safety*, Dallas, TX, 2009, 4 pages.
13. **H. Bořil** and J. H. L. Hansen, “Unsupervised equalization of Lombard effect for speech recognition in noisy adverse environment,” in *Proc. of IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP’09)*, Taipei, Taiwan, April 2009, pp. 3937–3940.
14. **H. Bořil**, P. Fousek, and H. Höge, “Two-stage system for robust neutral/Lombard speech recognition,” in *Proc. of Interspeech’07*, Antwerp, Belgium, 2007, pp. 1074–1077.
15. **H. Bořil**, T. Bořil, and P. Pollák, “Methodology of Lombard speech database acquisition: Experiences with CLSD,” in *Proc. of 5th Conference on Language Resources and Evaluation (LREC 2006)*, Genova, Italy, 2006, pp. 1644–1647.
16. **H. Bořil**, “Design of Speech Feedback, Comparison of Features for Lombard speech recognition,” in *Proc. of Analysis and Processing of Speech and Biological Signals*, CTU Publishing House, in Czech, Prague, Czech Republic, pp. 24–30.
17. **H. Bořil**, P. Fousek, and P. Pollák, “Data-driven design of front-end filter bank for Lombard speech recognition,” in *Proc. of International Conference on Spoken Language Processing (ICSLP’06)*, Pittsburgh, Pennsylvania, 2006, pp. 381–384.
18. **H. Bořil**, P. Fousek, D. Sündermann, P. Červa, and J. Ždánský, “Lombard speech recognition: A comparative study,” in *Proc. of 16th Czech-German Workshop on Speech Processing*, Prague, Czech Republic, 2006, pp. 141–148.
19. **H. Bořil**, P. Fousek, “Influence of different speech representations and HMM training strategies on ASR performance,” in *Proc. of POSTER’06 – 10th International Student Conference on Electrical Engineering*, Prague, Czech Republic, 2006, 4 pages.

20. **H. Bořil**, “Automatic reconstruction of utterance boundaries time marks in speech database regrabbed from DAT recorder,” in *Proc. of International Workshop on Digital Technologies 2005*, Zilina, Slovakia, 2005, pp. 13–16.
21. **H. Bořil** and P. Pollák, “Comparison of three Czech speech databases from the standpoint of Lombard effect appearance,” in *Proc. of COST278 Final Workshop and ISCA Tutorial and Research Workshop on Applied Spoken Language Interaction in Distributed Environments (ASIDE) 2005*, Aalborg, Denmark, 2005.
22. **H. Bořil** and P. Pollák, “Design and collection of Czech Lombard Speech Database,” in *Proc. of Interspeech’05*, Lisboa, Portugal, 2005, pp. 1577–1580.
23. **H. Bořil** and P. Pollák, “Analysis of Lombard effect in several Czech databases,” in *Proc. of Joint 16th Conference on Electronic Speech Signal Processing (ESSP 2005) and 15th Czech-German Workshop on Speech Processing*, Prague, Czech Republic, pp. 253–259.
24. **H. Bořil**, T. Bořil, and P. Pollák, “Design of Lombard effect speech database,” in *Proc. of Radioelektronika 2005*, Brno, Czech Republic, 2005, pp. 144–147.
25. **H. Bořil**, “Recognition of speech under Lombard effect,” in *Proc. of 14th Czech-German Workshop on Speech Processing*, Prague, Czech Republic, 2004, pp. 110–113.
26. **H. Bořil** and P. Pollák, “Direct time domain fundamental frequency estimation of speech in noisy conditions,” in *Proc. of European Signal Processing Conference (EUSIPCO) 2004*, vol. 1, Vienna, Austria, 2004, pp. 1003–1006.
27. **H. Bořil**, “Parameter changes and recognition of speech under stress,” Survey, in *Proc. of Signal Analysis and Processing V*, CTU Publishing House, in Czech, Prague, Czech Republic, pp. 54–65.
28. **H. Bořil**, “Pitch detector for guitar MIDI converter,” in *Proc. of POSTER’03 – 7th International Student Conference on Electrical Engineering*, Prague, Czech Republic, 2003, pp. EI1 (2 pages).

LECTURES/ABSTRACTS/REPORTS

29. Y. Lei, T. Hasan, J.-W. Suh, A. Sangwan, **H. Bořil**, L. Gang, K. Godin, C. Zhang, and J. H. L. Hansen, “The CRSS Systems for the 2010 NIST Speaker Recognition Evaluation,” *NIST 2010 Speaker Recognition Evaluation Workshop*, Brno, Czech Republic, 24–25 June 2010.
30. **H. Bořil**, T. Kleinschmidt, P. Boyraz, and J. H. L. Hansen, “Impact of cognitive load and frustration on drivers,” *Journal of the Acoustical Society of America*, vol. 127, no. 3, pp. 1996–1996, March 2010. Presented in *Joint 159th ASA Meeting and Noise-Con 2010, Invited Lecture*, Baltimore, Maryland, 19–23 April 2010.
31. **H. Bořil**, “Attributes and recognition of Lombard speech,” *Invited Lecture, Sound to Sense (S2S) Workshop - Speech in Adverse Conditions* (Prague, Czech Republic), Sept. 2008.
32. **H. Bořil**, “Normalization of Lombard effect,” CTU in Prague & Siemens Corporate Technology, Munich, Research Report No. R07-2, 52 pages, 2007.
33. **H. Bořil** and P. Pollák, “Czech Lombard Speech Database (CLSD’05),” CTU in Prague, Research Report No. R07-1, 24 pages, 2006.
34. **H. Bořil** and P. Pollák, “Pitch-marking based on the DFE algorithm,” *Lecture, 6th Meeting of European Center of Excellence in Speech Synthesis (ECESS) and TC-STAR WP3* (Berlin, Germany), Jan. 2006.
35. **H. Bořil**, “Design and acquisition of Lombard speech database, first experiments,” *Lecture*, Institute of Radio Engineering and Electronics, Czech Academy of Sciences, Prague, Czech Republic, Dec. 2004.