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Education

- **Ph.D. Electrical and Computer Engineering**—Johns Hopkins University
Baltimore, Maryland, U.S.A.
 - Thesis: Minimum Bayes Risk Techniques in Automatic Speech Recognition and Statistical Machine Translation.
 - Advisor: Prof. William Byrne.
 - October, 2004.
- **M.S.E. Electrical and Computer Engineering**—Johns Hopkins University
Baltimore, Maryland, U.S.A.
 - June 2000.
- **B.E. Electrical and Electronics Engineering**—Birla Institute of Technology and Science
Pilani, India.
 - June 1998.

Research Experience

- **Center for Language and Speech Processing**—Johns Hopkins University
Postdoctoral Fellow: November 2004–present
 - Designing models and algorithms for Statistical Machine Translation.
 - Investigating extensions to the Weighted Finite State Transducer Translation Template Modeling framework for Statistical Machine Translation.
 - Working towards the development of the Johns Hopkins University Chinese-to-English and Arabic-to-English Machine Translation (MT) Systems for the NIST 2005 MT Evaluations.
- **Center for Language and Speech Processing**—Johns Hopkins University
Graduate Research Assistant: January 2000–October 2004
 - Investigated Minimum Bayes-risk decoding procedures in automatic speech recognition and statistical machine translation. Formulated and implemented a statistical translation model using weighted finite state transducers. Developed a novel approach for performing word alignment of bilingual texts using phrase-based translation models. Designed a risk-based procedure for segmenting speech recognition word lattices into smaller sub-lattices. Worked on voting techniques to combine outputs from multiple speech recognizers.
 - Contributed significantly to the development of the Johns Hopkins University Chinese-to-English statistical machine translation systems for the NIST 2002, 2003, and 2004 MT evaluations.

- Contributed significantly to the development of the Johns Hopkins University large vocabulary conversational speech transcription systems for the NIST 2001 and 2002 Rich Transcription evaluations.
- Supervisor: Prof. William Byrne
- **CLSP Language Engineering Workshop**—Johns Hopkins University
Graduate Student Researcher: June-August 2003
 - Investigated techniques to incorporate syntactic structure into a statistical machine translation system.
 - Supervisor: Dr. Franz Och
- **Speech Research Group**—Microsoft Research, Redmond WA
Summer Research Intern: June-August 2000
 - Worked on segmental acoustic modeling techniques for speech recognition.
 - Supervisor: Dr. Hsiao-Wuen Hon
- **CLSP Language Engineering Workshop**—Johns Hopkins University
Graduate Student Researcher: June-August 1999
 - Developed novel statistical techniques for text normalization in text-to-speech systems.
 - Supervisor: Dr. Richard Sproat
- **Hughes Software Systems**—Gurgaon, India
Intern: January-June 1998
 - Studied and designed an echo-canceller for a voiceband modem based on ITU-T V.34 specifications.
- **Birla Institute of Technology and Science**—Pilani, India
Honors Student: August-December 1997.
 - Developed a prototype speech processing unit for vocally disabled to communicate in Hindi.

Teaching Experience

- **Teaching Assistant**—Department of Electrical and Computer Engineering
Johns Hopkins University
 - Information Extraction from Speech and Text, Prof. Fred Jelinek, Spring 2002.
 - Electrical Engineering Laboratory, Prof. Jin Kang, Fall 1999.
 - Parallel Processing, Dr. Robert Jenkins, Spring 1999.
 - Circuits, Prof. Howard Weinert, Fall 1998.

Skills

- **Programming Languages:** C, Perl, C++, L^AT_EX, UNIX Shells.
- **Operating Systems:** Linux, Mac OS X, Windows.
- **Tools:** AT&T FSM Tools, HTK, SRILM, MATLAB.

Honors and Awards

- Graduate Teaching Assistantship, Department of Electrical and Computer Engineering, Johns Hopkins University, September 1998 to December 1999
- National Talent Search Scholarship awarded by the Government of India based on 2 stages of national level examinations and an interview

Professional Activities

- Reviewer, *IEEE Transactions on Speech and Audio Processing*, 2004
- Program Committee, *Journal of Natural Language Engineering*, Special Issue on Parallel Texts, 2004
- Program Committee, Student Research Workshop, *HLT-NAACL*, 2004
- Member, Association for Computational Linguistics.
- Member, International Speech Communication Association.

Research Interests

- Machine translation, Large vocabulary continuous speech recognition, Statistical modeling and classification approaches in speech and language.

Publications

- Journals and Research Notes
 - V. Goel, S. Kumar and W. Byrne. "Segmental Minimum Bayes-Risk Decoding for Automatic Speech Recognition", *IEEE Transactions on Speech and Audio Processing*, Vol 12(3), 234-250, 2004.
 - S. Kumar, Y. Deng and W. Byrne. "A Weighted Finite State Transducer Translation Template Model for Statistical Machine Translation", *Journal of Natural Language Engineering*, Accepted, To appear.
 - Y. Deng, S. Kumar and W. Byrne. "Bitext Chunk Alignment for Statistical Machine Translation", *Journal of Natural Language Engineering*, Submitted.
 - S. Kumar and W. Byrne. "A Weighted Finite State Transducer Translation Template Model for Statistical Machine Translation", *Research Note No. 48*, Center for Language and Speech Processing, Johns Hopkins University, April 2004.
 - R. Sproat, A. Black, S. Chen, S. Kumar, M. Ostendorf and C. Richards. "Normalization of Non-Standard Words", *Computer Speech and Language*, Vol 15(3), 287-333. 2001.
- Conferences
 - S. Kumar and W. Byrne. "Minimum Bayes-Risk Decoding for Statistical Machine Translation", *Proceedings of HLT-NAACL*, May 2004, Boston, MA, USA.
 - F. J. Och, D. Gildea, S. Khudanpur, A. Sarkar, K. Yamada, A. Fraser, S. Kumar, L. Shen, D. Smith, K. Eng, V. Jain, Z. Jin, D. Radev. "A Smorgasbord of Features for Statistical Machine Translation", *Proceedings of HLT-NAACL*, May 2004, Boston, MA, USA.

- W. Byrne, S. Khudanpur, W. Kim, S. Kumar, P. Pecina, P. Virga, P. Xu and D. Yarowsky. “The Johns Hopkins University 2003 Chinese-English Machine Translation System”, *Proceedings of MT-Summit IX*, September 2003, New Orleans, LA, USA.
 - S. Kumar and W. Byrne. “A Weighted Finite State Transducer Implementation of the Alignment Template Model for Statistical Machine Translation”, *Proceedings of HLT-NAACL*, May 2003, Edmonton, Canada.
 - S. Kumar and W. Byrne. “Minimum Bayes-Risk Word Alignment of Bilingual Texts”, *Proceedings of EMNLP*, July 2002, Philadelphia, PA, USA.
 - S. Kumar and W. Byrne. “Risk Based Lattice Cutting for Segmental Minimum Bayes-Risk Decoding”, *Proceedings of ICSLP*, September 2002, Denver, CO, USA.
 - V. Goel, S. Kumar and W. Byrne. “Confidence Based Lattice Segmentation and Minimum Bayes-Risk Decoding”, *Proceedings of Eurospeech*, September 2001, Aalborg, Denmark.
 - V. Goel, S. Kumar and W. Byrne. “Segmental Minimum Bayes-Risk ASR Voting Strategies”, *Proceedings of ICSLP*, October 2000, Beijing, China.
- Workshops
 - S. Kumar, Y. Deng, and W. Byrne. “The Johns Hopkins University 2004 Chinese-English and Arabic-English Machine Translation Evaluation Systems”, *NIST Machine Translation Workshop*, June 2004, Alexandria, VA, USA.
 - W. Byrne, S. Khudanpur, W. Kim, S. Kumar, P. Pecina, P. Virga, P. Xu and D. Yarowsky. “The Johns Hopkins University 2003 Chinese-English Machine Translation System”, *NIST Machine Translation Workshop*, July 2003, Gaithersburg, MD, USA.
 - W. Byrne, V. Doumpiotis, S. Kumar, S. Tsakalidis and V. Venkataramani. “The JHU 2002 RT-02 Large Vocabulary Speech Recognition System”, *NIST RT-02 Workshop*, May 2002, Vienna, VA, USA.
 - W. Byrne, A. Gunawardana, S. Kumar and V. Venkataramani. “The JHU Hub-5 Conversational Speech Transcription System”, *NIST Hub-5 LVCSR Workshop*, May 2001, Linthicum Heights, MD, USA.

References

- Available upon request.