Katrin Kirchhoff is a Research Professor in the Electrical Engineering Department at the University of Washington, with adjunct appointments in the Departments of Computer Science and Linguistics. Prior to joining the University of Washington she studied Linguistics, Phonetics, and Computer Science at the Universities of Bielefeld, Germany, and Edinburgh, UK, and at the International Computer Science Institute in Berkeley. She obtained her PhD in Computer Science from the University of Bielefeld in 1999. Her research interests span speech processing, natural language processing, machine translation, and, more recently, health informatics. Katrin's past work includes the development of articulatory modeling techniques for speech processing, multilingual language technology, and Factored Language Models. She has published over 100 peer-reviewed articles and is currently serving on the editorial boards of Computer, Speech and Language and Speech Communication.

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**ABSTRACT**

This talk focuses on the combination of two machine learning techniques for acoustic modeling in speech recognition: deep neural networks (DNNs) and graph-based semi-supervised learning (SSL). While DNNs are powerful supervised classifiers, graph-based SSL can exploit valuable complementary information derived from the manifold structure of the unlabeled test data. Previous work on graph-based SSL in acoustic modeling has been limited to frame-level classification on small phonetic recognition tasks and has not been compared to, or integrated with, state-of-the-art DNN/HMM speech recognition systems. In this talk I will describe several techniques for integrating graph-based SSL into DNN-based speech recognizers for medium to large vocabulary speech recognition. Results demonstrate that SSL-enriched systems can achieve significant improvements in HMM state classification accuracy and consistent reductions in word error rate over state-of-the-art DNN/HMM baseline systems. Finally, methods for improving the scalability and computational efficiency of graph-based methods will be addressed.

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