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RESEARCH INTERESTS More	Machine learning in graphical models for detection and signal processing. Development and analysis of algorithms for inference in graphical models with a focus on computational complexity and average case performance. System design based on information theoretic and algorithmic analyses.
EDUCATION	**Carnegie Mellon University** (CMU), Pittsburgh, Pennsylvania USA Electrical and Computer Engineering, M.S in 2005 and Ph.D. Expected Dec 2010
HONORS AND AWARDS	National Talent Search Examination (NTSE) scholarship, Government of India, 1997, Top 1% of Physics students in India, in selection for International Physics Olympiad, Awarded Jawaharlal Nehru Center for Advanced Scientific Research scholarship for 2001.
RESEARCH PROJECTS More	**Machine learning and graphical models for measurement networks** Derived achievable bounds for the number of measurements required in detection applications such as sensor networks, biological screening and drug discovery. Developed efficient algorithms for inference in these graphical models. Showed how to use the analyses to improve system design. **Applications of machine learning and graphical models to speech and image processing** Speaker localization and speech separation using multiple microphones. Graphical model approach to iris matching under local shifts and occlusions. Multi-frame distortion-tolerant correlation filtering for video sequences. Speaker segmentation and speaker recognition in telephone conversations.
TEACHING	Teaching Assistant: Advanced Digital Signal Processing, 2006 and Information Theory, 2008.
COURSES TAKEN Details	**Math :** Introduction to Coding Theory, Advanced Stochastic Calculus, Discrete Mathematics, Complex Large-Scale Dynamic Systems, Methods of Optimization. **Probability and Machine learning :** Probabilistic Graphical Models, Estimation, Detection and Identification, Pattern Recognition Theory, Information Theory and Coding, Artificial Intelligence: Machine Learning, Applied Stochastic Processes. **Misc :** Inventing the Future of Services, Advanced DSP, Building Speech Recognition Systems.
REFERENCES	Prof. Rohit Negi, Prof. Raj Reddy, Prof. Pradeep Khosla, Carnegie Mellon University. Dr. Ryan Kerekes, Oak Ridge National Laboratory, Dr. Yaron Rachlin, Draper Laboratory.
SELECTED PUBLICATIONS Online	**Robust lossy detection using sparse measurements..**, (with Negi and Khosla) *ISIT2010*. An information theoretic bound on the performance of sparse regular measurement graphical models. Applied these bounds to genetic screening and compared with practical algorithms. **Robust detection of random variables using sparse measurements**, (with Negi and Khosla) *Allerton2009*. Analyzed the effect of model mismatch and parameter uncertainty in certain special graphical models. Showed how system diversity can increase robustness to these effects. **...The computational complexity of sequential decoding...**, (with Negi and Khosla) *ISIT2008*. Analyzed an inference algorithm useful in sensor networks and channel coding. **The sequential decoding metric for detection...**,(with Rachlin et. al.) *ISIT2007*. Improved a metric-first inference algorithm based the intuition from an information theoretic analysis. **Graphical Model Approach to Iris Matching Under Deformation and Occlusion**, (with Kerekes et. al.) *CVPR2007*. Used graphical models with belief propagation to account for distortion and occlusions in iris recognition. *System performed near the top at grand challenge evaluations.* **Increasing Sensor Measurements to Reduce Detection Complexity...**, (with Rachlin et. al.) *MILCOM2006*. Showed - using thermal sensor measurements - that it is possible to trade-off computation and the number of measurements in practical measurement networks. **Multi-frame distortion-tolerant correlation filtering for video sequences**, (with Kerekes et. al.) *SPIE2006*. A fast inference algorithm for graphical models in target tracking. **...Text Independent Speaker Identification**, (with Gangadharaiah) *ICASSP2005*. Used a robust estimator to remove outliers and increase robustness of a speaker identification system. **...Two-Speaker Segmentation**, (with Gangadharaiah and Balakrishnan) *ICSLP2004*. A HMM like graphical model and a simplified inference algorithm for segmenting telephone conversations.