

Nikola Jevtić

Research Interests

Speech Recognition, Information Theory, Machine Learning , Artificial Intelligence

Education

- **Ph.D. in Electrical and Computer Engineering (Speech Recognition)** **Expected: December 2004**
University of California San Diego
GPA: 3.975/4.00
- **M.S. in Electrical and Computer Engineering** **December 2000**
University of California San Diego
GPA: 3.975/4.00
- **B.Sc. in Electrical Engineering** **September 1998**
School of Electrical Engineering, University of Belgrade, Yugoslavia
GPA: 9.58/10.00

Work Experience

Research Assistant **1998 – present**
Electrical and Computer Engineering, University of California San Diego

Participated in the development of the speech recognition software in Java, key person for language modeling tools and decoder. Also participated in the development of the HMM subsystem. Authored research papers and presented these at technical conferences.

Teaching Assistant **Fall 2000**
Electrical and Computer Engineering, University of California San Diego

Organized and taught discussion sections for the graduate Information Theory and undergraduate Discrete Mathematics course. Prepared and graded homework assignments, midterms and finals. Held office hours, counseled students individually.

Papers

- A. Klautau, N. Jevtić, A. Orlitsky
“Server-assisted speech recognition over the Internet”
IEEE International Conference on Acoustics, Speech and Signal Processing, Istanbul.,
June 2000
- N. Jevtić, A. Klautau, A. Orlitsky
“Estimated rank pruning and Java based speech recognition”
Automatic Speech Recognition and Understanding Workshop, Madonna Di Campiglio,
December 2001
- N. Jevtić, A. Orlitsky, N. P. Santhanam
“Universal compression of unknown alphabets”
International Symposium on Information Theory, Lausanne.,
July 2002
- A. Klautau, N. Jevtić, A. Orlitsky
“Combined binary classifiers with applications to speech recognition”
International Conference on Spoken Language Processing, Denver,
September 2002

- A. Klautau, N. Jevtić, A. Orlitsky
“On nearest-neighbor ECOC with application to all-pairs multiclass SVM”
Journal of Machine Learning Research,
April 2003, vol. 4, 1-15
- A. Klautau, N. Jevtić, A. Orlitsky
“Discriminative Gaussian Mixture Models: A Comparison with Kernel Classifiers”
International Conference on Machine Learning, Washington DC,
August 2003
- N. Jevtić, A. Orlitsky
“On the Relation Between Additive Smoothing and Universal Coding”
Automatic Speech Recognition and Understanding Workshop, St.Thomas, US Virgin Islands
December 2003
- N. Jevtić, A. Orlitsky, N. P. Santhanam
“A lower bound on compression of unknown alphabets”
Accepted for publication in Theoretical Computer Science.
- N. Jevtić, A. Orlitsky
“A Universal Compression Perspective of Smoothing”
Submitted to Computer Speech and Language.

Awards

- Best poster award, Electrical and Computer Engineering Department, UCSD Research Review 2000
- Several First and Second place awards during my undergraduate school, in Math competitions in Elektrijska, annual competitions among all Electrical Engineering Universities in Serbia and Montenegro
- A couple of First places on Serbian Math Olympics during elementary and high school

Scholarships

- Summer research program at University of Illinois at Chicago, **July 1996**
Merit award given annually to 40 best students of Yugoslav universities
- Seminar on Telecommunications, National Technical University of Athens **February**
Merit award given annually to the 20 best students at the School of Electrical **1997**
Engineering, University of Belgrade, Yugoslavia
- Scholarship from Yugoslav Foundation for Young Talents in Arts and Sciences **1989-1998**

Projects

- Speech Coding and Recognition* **Language modeling tools**
Implemented a Java toolkit for n-gram language modeling for LVCSR. Investigated smoothing methods from a universal-compression perspective.
- Large vocabulary decoder**
Implemented a Java decoder for LVCSR. Designed new approaches for efficiently combining information sources (language model, pronunciation dictionary, acoustic models). Small memory footprint for the inherently large structures involved was achieved and efficient search strategies for recombination of active hypotheses “in place” in adaptive beam search showed 14 times faster recognition than MSU open source C++ decoder.

Kernel classifiers for speech recognition

Investigated the use of kernel-based classifiers such as Support, Relevance, and Informative Vector Machines for speech recognition. Optimal combination of binary classifiers was considered and all-pairs ECOC matrix performed best. However discriminatively trained mixture of Gaussian distributions outperformed kernel methods on several general machine learning tasks, including some speech related.

Server-Assisted Speech recognition over the Internet

Demonstrated a new approach for Speech recognition over the Internet. The system was written in java, and enables browsing the Internet using voice. Another demo was playing the tic-tac-toe over the Internet using voice.

Speech coding

Implemented CELP speech coder for a class project

Speech Recognition based on Wavelets with HMT structure

Studied a new approach for using wavelets in speech recognition, by imposing Hidden Markov Tree structure to capture additional correlation from wavelet coefficients, within the standard temporal HMM setting.

*Image
Coding*

Coding of similar images

Implemented a coder combining a JPEG coding and VQ to reduce the bit rate of coded images with assumed similarity, while in the same time producing identical output as a simple JPEG coder (class project).

*Turbo
Codes*

Turbo Code Simulation

Simulated Turbo code demonstrating performance for various SNR (class project).

Skills

Programming	Expert knowledge of C, C++, Java. Good knowledge of shell scripts, Latex and Matlab.
Development Tools	Visual Studio, Emacs, CVS, Macromedia Dreamweaver, Borland Jbuilder
Foreign Languages	Spanish and French

References

Dr. Alon Orlitsky

Professor

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