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4. **Abstract Title**: Classification of Chords by Neural Networks

5. **Authors**: Harald Schmidl, and Dilip Sarkar, Department of Mathematics and Computer Science, University of Miami, Coral Gables, FL 33156, email-harald@cs.miami.edu

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7. **Abstract**

This paper is motivated by the work of Laden and Keefe (1989), and addresses the topic of pitch class recognition. A neural net with one hidden layer is trained to recognize all thirty-six major, minor and diminished chords, which can be built over a chromatic scale that starts and ends in C.

A harmonic complex representation is chosen for the chords. Each tone is represented by five partial harmonics. A three note chord consists of fifteen partials. Our net is trained with the Error Backpropagation algorithm. The effect of different learning rates and hidden layer sizes are studied. Experiments with a technique known as Bold Driver to speedup the learning are also conducted.

Following the work of Laden and Keefe (1989), we examine the recognition of incomplete patterns, that is, chords with some harmonics missing. The recognition performance of the system could be significantly improved by adding noise in the training session, and using voting networks. Also the number of epochs needed to recognize all chords could be drastically reduced compared to Laden and Keefe's work.

8. **Keywords:** Neural networks, bold driver method, generalization, voting networks.

9. **Session**: Innovative application