Study shows computer programs can classify dog barks better than humans

January 16 2008

Computer programs may be the most accurate tool for studying acoustic communications amongst animals, according to Csaba Molnar from Eoetvoes Lorand University in Hungary and his research team. Their paper, published in Springer's journal *Animal Cognition* this week, shows that a new piece of software is able to classify dog barks according to different situations and even identify barks from individual dogs, a task humans find challenging.

The aim of Molnár and colleagues' experiments was to test a computer algorithm's ability to identify and differentiate the acoustic features of dog barks, and classify them according to different contexts and individual dogs. The software analyzed more than 6000 barks from 14 Hungarian sheepdogs (Mudi breed) in six different situations: 'stranger', 'fight', 'walk', 'alone', 'ball' and 'play'. The barks were recorded with a tape recorder before being transferred to the computer, where they were digitalized and individual bark sounds were coded, classified and evaluated.

In the first experiment looking at classification of barks into different situations, the software correctly classified the barks in 43 percent of cases. The best recognition rates were achieved for 'fight' and 'stranger' contexts, and the poorest rate was achieved when categorizing 'play' barks. These findings suggest that the different motivational states of dogs in aggressive, friendly or submissive contexts may result in acoustically different barks.

In the second experiment looking at the recognition of individual dogs, the algorithm correctly classified the barks in 52 percent of cases. The software could reliably discriminate among individual dogs while humans can not, which suggests that there are individual differences in barks of dogs even though humans are not able to recognise them.

The authors conclude by highlighting the value of their new methodology: “The use of advanced machine learning algorithms to classify and analyze animal sounds opens new perspectives for the understanding of animal communication…The promising results obtained strongly suggest that advanced machine learning approaches deserve to be considered as a new relevant tool for ethology.”

Reference: Molnar C et al (2008). Classification of dog barks: a machine learning approach. Animal Cognition (DOI 10.1007/s10071-007-0129-9)

Source: Springer