# SEXNET: A NEURAL NETWORK IDENTIFIES SEX FROM HUMAN FACES

**B.A. Golomb, D.T. Lawrence, and T.J. Sejnowski**
The Salk Institute
10010 N. Torrey Pines Rd.
La Jolla, CA 92037

## Abstract

Sex identification in animals has biological importance. Humans are good at making this determination visually, but machines have not matched this ability. A neural network was trained to discriminate sex in human faces, and performed as well as humans on a set of 90 exemplars. Images sampled at 30x30 were compressed using a 900x40x900 fully-connected back-propagation network; activities of hidden units served as input to a back-propagation "SexNet" trained to produce values of 1 for male and 0 for female faces. The network's average error rate of 8.1% compared favorably to humans, who averaged 11.6%. Some SexNet errors mimicked those of humans.

## 1   INTRODUCTION

People can capably tell if a human face is male or female. Recognizing the sex of conspecifics is important. While some animals use pheromones to recognize sex, in humans this task is primarily visual. How is sex recognized from faces? By and large we are unable to say. Although certain features are nearly pathognomonic for one sex or the other (facial hair for men, makeup or certain hairstyles for women), even in the absence of these cues the determination is made; and even in their presence, other cues may override.

Sex-recognition in faces is thus a prototypical pattern recognition task of the sort at which humans excel, but which has vexed traditional AI. It appears to follow no simple algorithm, and indeed is modifiable according to fashion (makeup, hair etc). While ambiguous cases exist, for which we must appeal to other cues such as physical build (if visible), voice patterns (if audible), and mannerisms, humans are