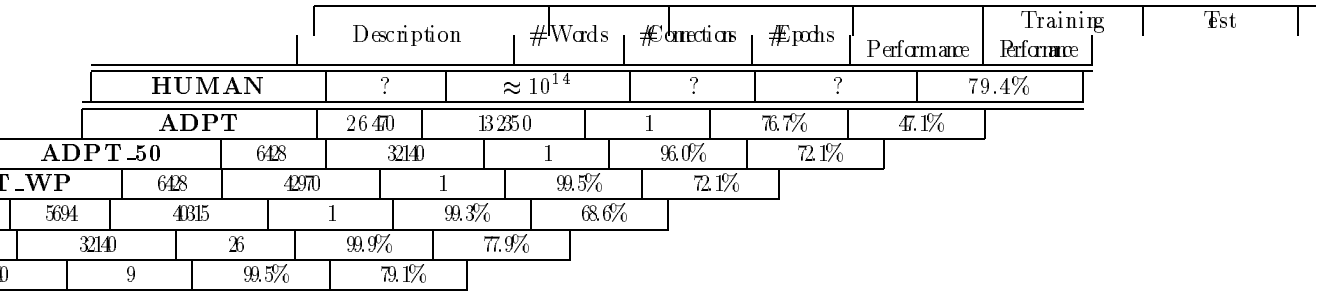

	Description	#Words	#Connections	#Epochs	Performance	Training Performance	Test
HUMAN	?	$\approx 10^{14}$	?	?	79.4%		
ADPT	26470	132350	1	76.7%	47.1%		
ADPT_50	6428	32140	1	96.0%	72.1%		
T_WP	6428	42970	1	99.5%	72.1%		
	5694	40315	1	99.3%	68.6%		
	32140	26	99.9%	77.9%			
0	9	99.5%	79.1%				

(see text for details)

sifier that improves in-

The 1204 mails were labelled according to this division. All administrative information and routing infor-
emoved automatically except for the subject and the sender of a message.
l are summarized in Table 1

2 Trai ni ng Procedures

Two underl yi ng trai ni ng procedures were used for the ACCSYS-network:

Adapti ve Learni ng: This algorithmwas originally proposed by Gori n
weights w_{nk} between the n-th input unit v_n and tl
mutual information $I(c_k$

Flexibility Through Incremental Learning: Neural Networks for Text Categorization

P. Geutner, U. Bodenhausen and A. Waibel

ment of Computer Science
ersity of Karlsruhe
7500 Karlsruhe 1
Germany

School of Computer Science
Carnegie Mellon University
Pittsburgh, Pennsylvania 15213
USA

pgeutner@ira.uka.de, uli@cs.cmu.edu, ahw@cs.cmu.edu

Abstract

owan adaptive incremental learning algorithm that learns interactively to classify
essages (here: emails) into categories without the need for lengthy batch training runs. The
algorithm was evaluated on a large database of email messages that fall into five subjective categories.
As control experiment best human categorization performance was established at 79.4% for this task.
The best of all connectionist architectures presented here achieves near human perfor
This architecture acquires its language model and dictionary adaptively
of either. The learning algorithm combines an adaptive pha
weights during interaction and a tuning phase
data. Such systems can be deploy
necessary such a
ge

1

A