



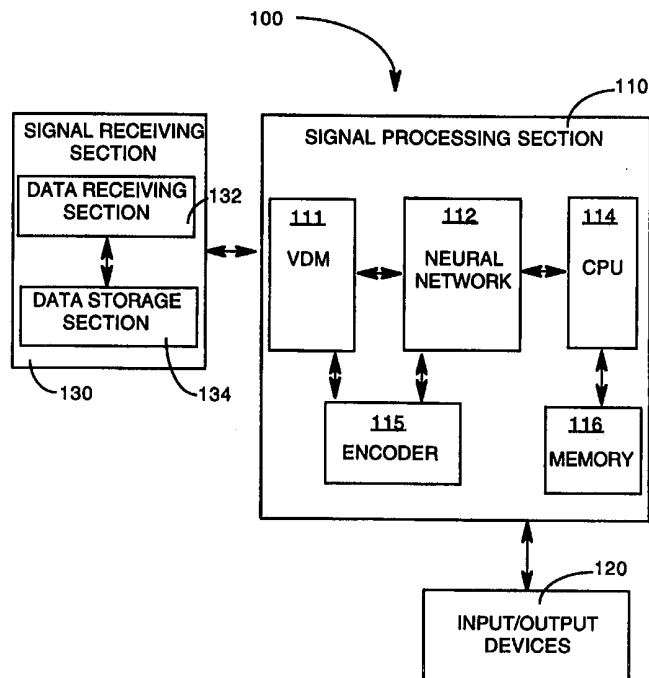
INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

<p>(51) International Patent Classification <sup>6</sup> : <b>G06F 15/18</b></p>	<p><b>A3</b></p>	<p>(11) International Publication Number: <b>WO 97/39417</b> (43) International Publication Date: 23 October 1997 (23.10.97)</p>
<p>(21) International Application Number: PCT/US97/05224 (22) International Filing Date: 31 March 1997 (31.03.97) (30) Priority Data: 60/014,266 29 March 1996 (29.03.96) US 60/014,687 2 April 1996 (02.04.96) US (71) Applicant: SARNOFF CORPORATION [US/US]; 201 Washington Road, CN-5300, Princeton, NJ 08543-5300 (US). (72) Inventors: DeVRIES, Aalbert; 5221 Town Court South, Lawrenceville, NJ 08648 (US). LUBIN, Jeffrey; 471 Harding Drive, South Orange, NJ 07079 (US). PETERSON, Heidi, A.; Apartment #6, 286 Elizabeth Street, New-York, NY 10012 (US). SPENCE, Clay; 136 Cranbury Road, Princeton Junction, NJ 08550 (US).</p>		<p>(81) Designated States: CA, JP, KR, MX, European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE).  Published <i>With international search report.</i> (88) Date of publication of the international search report: 14 May 1998 (14.05.98)</p>

(54) Title: METHOD AND APPARATUS FOR TRAINING A NEURAL NETWORK TO USE A FIDELITY METRIC

(57) Abstract

A signal processing apparatus (100, 400) and concomitant method for learning and using fidelity metric as a control mechanism and to process large quantities of fidelity metrics from a visual discrimination measure (VDM) (111) to a manageable subjective image quality ratings. The signal processing apparatus incorporates a VDM (111) and a neural network (112). The VDM (111) receives input image sequences and generates fidelity metrics, which are received by a neural network (112). The neural network (112) is trained to learn and use the fidelity metrics as a control mechanism, e.g., to control a video encoder.



**FOR THE PURPOSES OF INFORMATION ONLY**

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

<b>AL</b>	Albania	<b>ES</b>	Spain	<b>LS</b>	Lesotho	<b>SI</b>	Slovenia
<b>AM</b>	Armenia	<b>FI</b>	Finland	<b>LT</b>	Lithuania	<b>SK</b>	Slovakia
<b>AT</b>	Austria	<b>FR</b>	France	<b>LU</b>	Luxembourg	<b>SN</b>	Senegal
<b>AU</b>	Australia	<b>GA</b>	Gabon	<b>LV</b>	Latvia	<b>SZ</b>	Swaziland
<b>AZ</b>	Azerbaijan	<b>GB</b>	United Kingdom	<b>MC</b>	Monaco	<b>TD</b>	Chad
<b>BA</b>	Bosnia and Herzegovina	<b>GE</b>	Georgia	<b>MD</b>	Republic of Moldova	<b>TG</b>	Togo
<b>BB</b>	Barbados	<b>GH</b>	Ghana	<b>MG</b>	Madagascar	<b>TJ</b>	Tajikistan
<b>BE</b>	Belgium	<b>GN</b>	Guinea	<b>MK</b>	The former Yugoslav Republic of Macedonia	<b>TM</b>	Turkmenistan
<b>BF</b>	Burkina Faso	<b>GR</b>	Greece			<b>TR</b>	Turkey
<b>BG</b>	Bulgaria	<b>HU</b>	Hungary	<b>ML</b>	Mali	<b>TT</b>	Trinidad and Tobago
<b>BJ</b>	Benin	<b>IE</b>	Ireland	<b>MN</b>	Mongolia	<b>UA</b>	Ukraine
<b>BR</b>	Brazil	<b>IL</b>	Israel	<b>MR</b>	Mauritania	<b>UG</b>	Uganda
<b>BY</b>	Belarus	<b>IS</b>	Iceland	<b>MW</b>	Malawi	<b>US</b>	United States of America
<b>CA</b>	Canada	<b>IT</b>	Italy	<b>MX</b>	Mexico	<b>UZ</b>	Uzbekistan
<b>CF</b>	Central African Republic	<b>JP</b>	Japan	<b>NE</b>	Niger	<b>VN</b>	Viet Nam
<b>CG</b>	Congo	<b>KE</b>	Kenya	<b>NL</b>	Netherlands	<b>YU</b>	Yugoslavia
<b>CH</b>	Switzerland	<b>KG</b>	Kyrgyzstan	<b>NO</b>	Norway	<b>ZW</b>	Zimbabwe
<b>CI</b>	Côte d'Ivoire	<b>KP</b>	Democratic People's Republic of Korea	<b>NZ</b>	New Zealand		
<b>CM</b>	Cameroon			<b>PL</b>	Poland		
<b>CN</b>	China	<b>KR</b>	Republic of Korea	<b>PT</b>	Portugal		
<b>CU</b>	Cuba	<b>KZ</b>	Kazakstan	<b>RO</b>	Romania		
<b>CZ</b>	Czech Republic	<b>LC</b>	Saint Lucia	<b>RU</b>	Russian Federation		
<b>DE</b>	Germany	<b>LI</b>	Liechtenstein	<b>SD</b>	Sudan		
<b>DK</b>	Denmark	<b>LK</b>	Sri Lanka	<b>SE</b>	Sweden		
<b>EE</b>	Estonia	<b>LR</b>	Liberia	<b>SG</b>	Singapore		

INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US97/05224

**A. CLASSIFICATION OF SUBJECT MATTER**

IPC(6) :GO6F 15/18  
US CL : 395/11, 22

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 395/11, 22

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5,491,776 A (DANGI) 13 FEBRUARY 1996	1-10
A	US 5,495,542 A (SHIMOMURA ET AL) 27 FEBRUARY 1996	1-10
A	US 5,107,347 (HASHIMOTO ET AL) 21 APRIL 1992	1-10
A	US 5,309,525 A (SHIMOMURA ET AL) 03 MAY 1994	1-10
A	US 5,394,483 A (DALY) 28 FEBRUARY 1995	1-10

Further documents are listed in the continuation of Box C.  See patent family annex.

* Special categories of cited documents:	*T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
*A* document defining the general state of the art which is not considered to be of particular relevance	*X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
*E* earlier document published on or after the international filing date	*Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
*L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	*&* document member of the same patent family
*O* document referring to an oral disclosure, use, exhibition or other means	
*P* document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search

23 JUNE 1997

Date of mailing of the international search report

24 FEB 1998

Name and mailing address of the ISA/US  
Commissioner of Patents and Trademarks  
Box PCT  
Washington, D.C. 20231

Facsimile No. (703) 305-3230

Authorized officer

JEFFREY S. SMITH

Telephone No. (703) 305-9600