(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
30 November 2000 (30.11.2000)

PCT

(10) International Publication Number
WO 00/72182 A3

(51) International Patent Classification[7]: G06F 19/00

(21) International Application Number: PCT/US00/14159

(22) International Filing Date: 23 May 2000 (23.05.2000)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
09/318,699 25 May 1999 (25.05.1999) US

(71) Applicant *(for all designated States except US)*: **DIGITAL GENE TECHNOLOGIES, INC.** [US/US]; 11149 North Torrey Pines Road, Suite 110, La Jolla, CA 90237 (US).

(72) Inventors; and

(75) Inventors/Applicants *(for US only)*: **GRACE, Dennis, R.** [US/US]; 3137 Fenelon Street, San Diego, CA 92106 (US). **DURHAM, Jayson, T.** [US/US]; 10359 Mountain View Lane, Lakeside, CA 92040 (US).

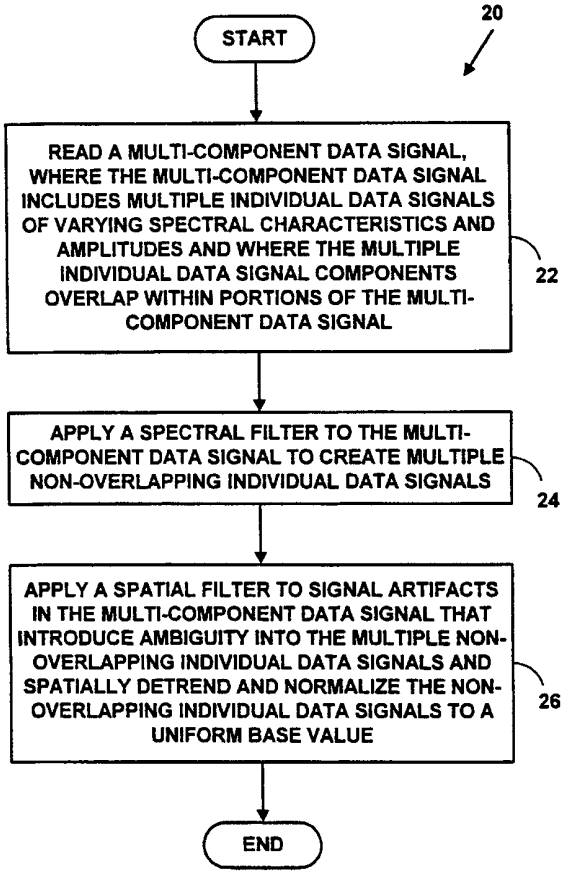
(74) Agent: **LESAVICH, Stephen**; McDonnell Boehnen Hulbert & Berghoff, Suite 3200, 300 South Wacker Drive, Chicago, IL 60606 (US).

(81) Designated States *(national)*: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.

(84) Designated States *(regional)*: ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

[Continued on next page]

(54) Title: METHODS AND SYSTEM FOR AMPLITUDE NORMALIZATION AND SELECTION OF DATA PEAKS



(57) Abstract: Methods and system for amplitude normalization and selection of data peaks from experimental data including polynucleotide data such as DNA, cDNA or mRNA from biotechnology experiments. The methods and systems include removing spectral overlap, spatially detrending and normalizing a multi-component data signal into experimental data from a desired experiment (e.g., biotechnology data). Standard data sizes are determined and data clutter is rejected for filtered experimental data. Data sizes are calibrated and error removed from experimental data. Data stutter is removed and the number of data values is reduced. The methods and_system help automate the processing of experimental data to eliminate or reduce errors and leave processed experimental data in a format suitable for visual display, comparative analysis and other analysis. The methods and systems may help reduce or eliminate inconsistencies in processing experimental data that typically lead to unreliable or erroneous results. The methods and system of the present invention may be used to refine processing of biotechnology data with new techniques that can be used for bioinformatics and for other types of experimental data that are visual displayed (e.g., telecommunications data, electrical data for electrical devices, optical data, physical data, or other data).

WO 00/72182 A3

Published:
— *With international search report.*

(88) Date of publication of the international search report:
15 March 2001

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

INTERNATIONAL SEARCH REPORT

Interi. ..nal Application No
PCT/US 00/14159

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 G06F19/00

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)
IPC 7 G06F

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 practical, search terms used)
EPO-Internal, WPI Data, IBM-TDB, INSPEC

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 98 00708 A (CHI VRIJMOED ;GILCHRIST RODNEY D (CA); VISIBLE GENETICS INC (CA)) 8 January 1998 (1998-01-08) abstract; claims 1-3 page 6, line 14 -page 7, line 24 ---	1-48
P,X	WO 00 22173 A (ALON URI ;LEVINE ARNOLD J (US); UNIV PRINCETON (US)) 20 April 2000 (2000-04-20) abstract; claims 41-47; figures 3,4 page 6, line 27 -page 7, line 32 --- -/--	1-48

[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

° Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"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)

"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

"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

"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

"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.

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
7 December 2000	14/12/2000

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Filloy García, E

1

Form PCT/ISA/210 (second sheet) (July 1992)

INTERNATIONAL SEARCH REPORT

Intern. nal Application No
PCT/US 00/14159

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication,where appropriate, of the relevant passages	Relevant to claim No.
A	GIDDINGS M C ET AL: "AN ADAPTIVE, OBJECT ORIENTED STRATEGY FOR BASE CALLING IN DNA SEQUENCE ANALYSIS" NUCLEIC ACIDS RESEARCH,OXFORD UNIVERSITY PRESS, SURREY,GB, vol. 21, no. 19, 1993, pages 4530-4540, XP000919267 ISSN: 0305-1048 the whole document ---	1-48
A	US 5 853 979 A (DEE GREGORY ET AL) 29 December 1998 (1998-12-29) abstract; claims 1,2; figures 1,2 column 8, line 10 - line 33 column 10, line 39 - line 54 ---	1-48
A	VERBEEK P W ET AL: "2-D ADAPTIVE SMOOTHING BY 3-D DISTANCE TRANSFORMATION" PATTERN RECOGNITION LETTERS,NL,NORTH-HOLLAND PUBL. AMSTERDAM, vol. 9, no. 1, 1989, pages 53-65, XP000098457 ISSN: 0167-8655 ---	
A	LUCKE L ET AL: "A DIGIT-SERIAL ARCHITECTURE FOR GRAY-SCALE MORPHOLOGICAL FILTERING" IEEE TRANSACTIONS ON IMAGE PROCESSING,US,IEEE INC. NEW YORK, vol. 4, no. 3, 1 March 1995 (1995-03-01), pages 387-391, XP000501913 ISSN: 1057-7149 -----	

1

INTERNATIONAL SEARCH REPORT

Information on patent family members

Inten nal Application No
PCT/US 00/14159

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 9800708 A	08-01-1998	US 5916747 A	29-06-1999
		AU 3250797 A	21-01-1998
		CA 2259314 A	08-01-1998
		US 5981186 A	09-11-1999
WO 0022173 A	20-04-2000	AU 1597400 A	01-05-2000
US 5853979 A	29-12-1998	AU 700410 B	07-01-1999
		AU 6403996 A	05-02-1997
		CA 2225385 A	23-01-1997
		DE 69601720 D	15-04-1999
		DE 69601720 T	22-07-1999
		EP 0835442 A	15-04-1998
		JP 11509622 T	24-08-1999
		WO 9702488 A	23-01-1997
		US 5834189 A	10-11-1998
		US 5916747 A	29-06-1999
		US 5981186 A	09-11-1999