PCT

WORLD INTELLECTUAL PROPERTY ORGANIZATION
International Bureau

INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification 4 : G06F 1/00	A1	(11) International Publication Number: WO 87/01478 (43) International Publication Date: 12 March 1987 (12.03.87)

(21) International Application Number: PCT/US86/01805

(22) International Filing Date: 3 September 1986 (03.09.86)

(31) Priority Application Number: PCT/US85/1670

(32) Priority Date: 3 September 1985 (03.09.85)

(33) Priority Country: US

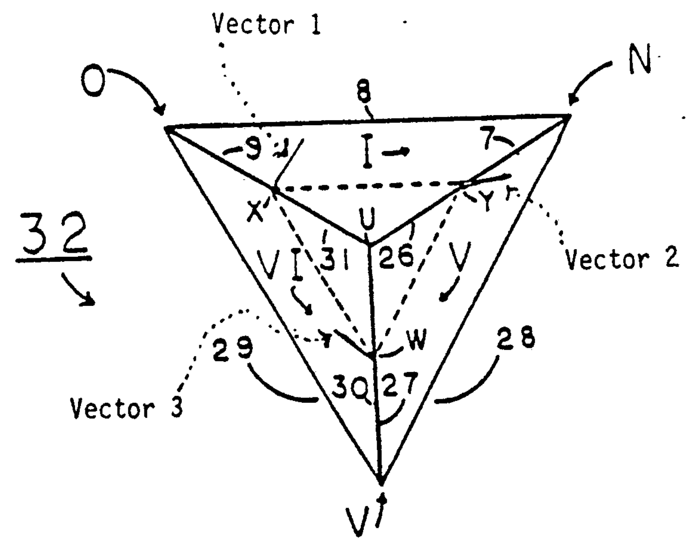
(60) Parent Application or Grant
(63) Related by Continuation
US PCT/US85/01670 (CIP)
Filed on 3 September 1985 (03.09.85)

(71)(72) Applicant and Inventor: FARNUM, Henry, Merritt [US/US]; Executive House, 225 E. 46 Street, New York, NY 10017 (US).

(81) Designated States: AT, AT (European patent), AU, BB, BE (European patent), BG, BR, CF (OAPI patent), CG (OAPI patent), CH, CH (European patent), CM (OAPI patent), DE, DE (European patent), DK, FI, FR (European patent), GA (OAPI patent), GB, GB (European patent), HU, IT (European patent), JP, KP, KR, LK, LU, LU (European patent), MC, MG, ML (OAPI patent), MR (OAPI patent), MW, NL, NL (European patent), NO, RO, SD, SE, SE (European patent), SN (OAPI patent), SU, TD (OAPI patent), TG (OAPI patent), US.

Published
With international search report.

(54) Title: A COMPUTER WITH AN ELECTRONIC MOSAIC OF POINTS IN THE SOLID OF A TETRAHEDRON



(57) Abstract

In the tetrahedron solid (32), the angular and linear relationships among regular and irregular points (O, V, N, U, X, Y, W) are predetermined, and measured by electrical impulses. The predetermined linear and angular relationships between and among any plurality of random, irregular points (O, V, N, U, X, Y, W) in a tetrahedron solid (32), are arrayed in a common relationships to a mosaic of regular locations (O, V, N, U, X, W) in the tetrahedron solid. The linear and angular relationships are represented by corresponding measurements. The tetrahedron solid (32) is a computer for the solution of problems, such as complex, simultaneous, linear equations. Variables are represented by corresponding electrical devices such as gates and switches. A complex mathematical problem is present logically in the tetrahedron solid (32). The logical resulsts are measured in the constant, unwarped mosaic of regular points (O, V, N, U, X, Y, W) in the solid of the tetrahedron.

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.

AT	Austria	**GA**	Gabon	**MR**	Mauritania
AU	Australia	**GB**	United Kingdom	**MW**	Malawi
BB	Barbados	**HU**	Hungary	**NL**	Netherlands
BE	Belgium	**IT**	Italy	**NO**	Norway
BG	Bulgaria	**JP**	Japan	**RO**	Romania
BR	Brazil	**KP**	Democratic People's Republic of Korea	**SD**	Sudan
CF	Central African Republic			**SE**	Sweden
CG	Congo	**KR**	Republic of Korea	**SN**	Senegal
CH	Switzerland	**LI**	Liechtenstein	**SU**	Soviet Union
CM	Cameroon	**LK**	Sri Lanka	**TD**	Chad
DE	Germany, Federal Republic of	**LU**	Luxembourg	**TG**	Togo
DK	Denmark	**MC**	Monaco	**US**	United States of America
FI	Finland	**MG**	Madagascar		
FR	France	**ML**	Mali		

A COMPUTER WITH AN ELECTRONIC MOSAIC OF POINTS IN THE SOLID OF A TETRAHEDRON

A PROBLEM IS A GEOMETRIC FIGURE

1. "How the Current Method Works"
"Mathematicians visualize such problems as complex geometric solids with millions or billions of facets. Each corner of each facet represents a possible solution. The task of the algorithm is to find the best solution, say the corner at the top, without having to calculate the location of every one." (New York Times, Nov. 19, 1984, p. A19)

2. Simplex method
"The simplex method, devised by the mathematician George B. Dantzig in 1947, in effect runs along the edges of the solid, checking one corner after another but always heading in the direction of the best solution." (Ibid.)

3. The Karmarkar algorithm
"The Karmarkar algorithm, by contrast, takes a giant short cut, plunging through the middle of the solid. After selecting an arbitrary interior point, the algorithm warps the entire structure--in essence, reshaping the problem--in a way designed to bring the chosen point exactly into the center. The next step is to find a new point in the direction of the best solution and to warp the structure again, bringing the new point into the center.
"The repeated transformations, based on a technique known as projective geometry, lead rapidly to the best answer."
(Ibid.)

In mathematical problem-solving, the best, known solution at any instant of time can be described as a "hypothetical solution", and as a hypothesis.

Recent methods in the prior art represent that hypothetical solution as a solid such as a sphere, for example, with the hypothetical solution at the center of the sphere. However, the distortion of a sphere by "warping the sphere with the best known solution at the center, randomly distorts every other reference point in the sphere. The prior art describes this as "warping" the sphere".

Although the hypothetical solution frequently represents progress, all other reference points in the sphere are displaced by said "warping," in relation to the center of the sphere. The random warping is the result of the error which remains in the best known solution. The "warping" randomly displaces every point in the solid, a sphere, in relation to every other point in the sphere, because the approximate solution is made the center of the sphere.

The warping method introduces errors in each successive "solution" to the problem. Because every other point in the solid of the sphere has been randomly displaced in relation to the center of the solid, a sphere.

The long felt need

The need, therefore, is a method for use of a suitable solid, in a method which accurately represents an unlimited number of individual, relevant values or numbers, completely accurately in relation to every other "point" or "irregular bit of information" in the solid.

This invention describes the tetrahedron as a unique solid among the regular polygons, for many reasons including the following.

Tetrahedron Structure (A Solid).

Fig. 1a shows four planes assembled into a three-dimensional solid, tetrahedron 32.

Fig. 1-a shows first plane MNO in a horizontal view. Its details not shown here were shown in Fig. 1-e. Plane MNO comprises seventh, eighth, and ninth girders 7, 8, and 9, and star I.

In Fig. 1-a, three additional planes are shown identical to said plane MN`, said four planes comprising a large triangle, plane MSP. The second plane, NSV, comprises first girder 27, second girder 28, and third girder 26, enclosing star V. Third plane CVP comprises first girder 31, second girder 29, and third girder 30, enclosing star VI. Said first, second, and third planes enclose fourth plane NVO, comprising first girder 7', second girder 8', and third girder 9', enclosing star I'.

Fig. 1-b shows a horizontal view of the structure shown in Fig. 1-a, with planes MNO, NSV, and OVP connected to construct a tetrahedron with its base comprising plane NVO, and with its apex designated U. Said planes are connected at a sixty degree angle in relation to each adjacent plane, by connectors (not shown)

Therefore, within the three-dimensional solid of tetrahderon 32, any location in the mosaic of triangle ACE in its base, is intersected by a line exactly perpendicular to the corresponding location in the mosaic of parallel plane WXY.

Similarly, each equilateral plane within the mosaic of plane NVO comprising the base of tetrahedron 32, selectively may be constructed in a parallel plane connected to the corresponding locations of tetrahedron 32. In each mosaic thus constructed, it is apparent that each location is intersected by a line exactly perpendicular to the corresponding location in base NVO, within the solid comprising tetrahedron 32.

Similarly, in the construction of tetrahedron 32, first plane MNO, second plane NSV, and third plane OVP comprise the surfaces of tetrahedron 32 shown in Fig. 1-b. Said three planes are identical to base NVO. Therefore any structural element connected to any said mosaic within the solid comprising tetrahedron 32, similarly may be connected to the corresponding locations within the mosaic comprising each of the said surfaces of tetrahedron 32.

It is apparent that tetrahedron 32 may be expanded to any order of magnitude, to comprise similar planes within its solid, and similar planes comprising its respective surfaces, with each respective mosaic of said planes and surfaces characterized by the same features as tetrahedron 32, supra.

Similarly, each surface of tetrahedron 32 is identical to its base NVO. Therefore tetrahedron 32 selectively may be rotated to establish any surface as its base, with its respective planes within said solid, and respective surfaces, characterized by the same features as tetrahedron 32, supra.

Therefore any plurality of tetrahedrons with common surfaces are characterized by the same features as tetrahedron 32, supra.

It is apparent that said features depend upon the equilateral triangle, in each plane, in each solid, and in its respective mosaic, whereby each included angle comprises 60 degrees, or multiples thereof.

Therefore tetrahedron 32, expanded to any order of magnitude, comprises said planes within the solid.

1. Mosaic of regular locations in a tetrahedron.

A tetrahedron is constructed by structural elements, each element with discrete locations, "regular" locations, at equal, linear increments for the length of the structural element.

2. At each vertex, each included angle is 60 degrees, or a multiple thereof

3. Therefore each vertex is the apex of a miniature tetrahedron, with each side the uniform length of one increment.

4. Each miniature tetrahedron, or subcomponent of the solid, is regularly displaced by angular increments of 60 degrees, in a uniform, angular relationship to every other subcomponent in the solid of the tetrahedron.

5. Each subcomponent therefore can move the dimensional information in its structure to the position of any other subcomponent in the solid, and nevertheless be in identical linear and angular relationship to every, corresponding subcomponent in the entire tetrahedron solid.

6. Therefore the dimensional information in each subcomponent never is "warped" in relation to the solid. Therefore warping will never cause an error in a subsequent computation using said dimensional information.

7. "Irregular" points in a subcomponent.

This invention provides "irregular" points for every point in the solid of that subcomponent. Each irregular point is connected by one or more connectors, or linear distances, positioning that irregular point in relation to one or more locations at equal increments in the solid of that subcomponent.

8. No "warping" even of irregular locations!

Therefore every point in the solid is at least an "irregular" point as described. Therefore every irregular point in its subcomponent can be moved to any other subcomponent in the entire tetrahedron solid, and remain in identical linear and angular relationship to every corresponding location in the entire tetrahedron. There is no dimensional warping, even of irregular locations. Therefore, even two irregular locations in the same or different subcomponents, remain in the same dimensional relationship to every, corresponding irregular point in the entire solid.

CONCLUSION: THEREFORE THIS INVENTION IS FREE OF DIMENSIONAL WARPING.

Computer Technologies

Analog computer. "Uses inputs that are proportional to the instantaneous value of variable quantities." (McGraw-Hill Encyclopedia of Science & Technology, 5th Edition, 1982, hereafter "M-H", p. 488)

Digital computer. "Uses symbolic representations of its variables". (M-H, p. 489)

Computer Applications

Computer-aided design and manufacturing "totally integrated CAD/CAM system". (M-H, pp. 490-491)

Numerical Control"The limits of accuracy on a workpiece are now controlled entirely by NC machines". (M-H, p. 491)

Computer Graphics. "Pictorial communication between men and computers". (M-H, p. 492)

Graphical Input. "Noninteractive and interactive". (M-H, p. 493)

Graphical Output. "plotting time is 30 μsec per point." (M-H, p. 494)

Computer storage technology (M-H, p. 496)

Main memory. "RAM chip densities of 256K bits or more" (M-H, p. 497 to 499)

Microcomputers. (M-H, 499-500)

Memory Gap Technologies. "access time 1 microsecond - 30 Milliseconds","capacity 10^7-10^9bits." (M-H, p. 500)

Switching

Transmission gate. "the output is a function of the inputs... "the logic gate". (M-H, p. 97)

switches "if a particular combination of input signals exists". (M-H, p. 98, switching gate).

A vector

A vector is a "directed line segment. As such, vectors have magnitude and direction." (M-H, p. 358) Therefore a vector can position an "irregular" point in the solid of a tetrahedron, if its angle is not in a 60 degree, angular relationship to the lines which construct its associated tetrahedron.

Programming the computer in this invention, in Fig. 1a

The length of time required by this computer can be one microsecond. Therefore this computer can make decisions at the rate of one new decision each microsecond. Each decision can be based upon preset criteria represented by vectors 1, 2, and 3 in Fig. 1a.

In a respective microsecond, the electrical characteristics of each vector can be decide the best way to serve an underprivileged person, as evaluated by the criteria present in relation to each vector.

The electrical characteristics can be connected to a "transmission gate", a "logic gate" at apex U of Fig. 1b. The logic gate actuates plane V, plane VI, or plane I, in accordance with "the particular combination of input signals" in the respective microsecond for the respective beneficiary.

Each of the computer technologies described in this application, and other comparable electronic technologies, can be used in any combination in the computer of this invention.

CLAIM

Whereupon the applicant claims:

1. An improved computer for analyzing information represented by electrical signals, wherein the improvement comprises:
   A. A mosaic of locations in at least a segment of a tetrahedron,
   B. said tetrahedron constructed with structural elements including linear locations at equal increments,
   C. at least one electrical signal representing its respective portion of said information,
   D. preset electrical means to respond to said signal by its respective, predetermined response to said respective signal,
   E. said preset electrical means associated with the mosaic of locations in said tetrahedron.

FIG. 1a

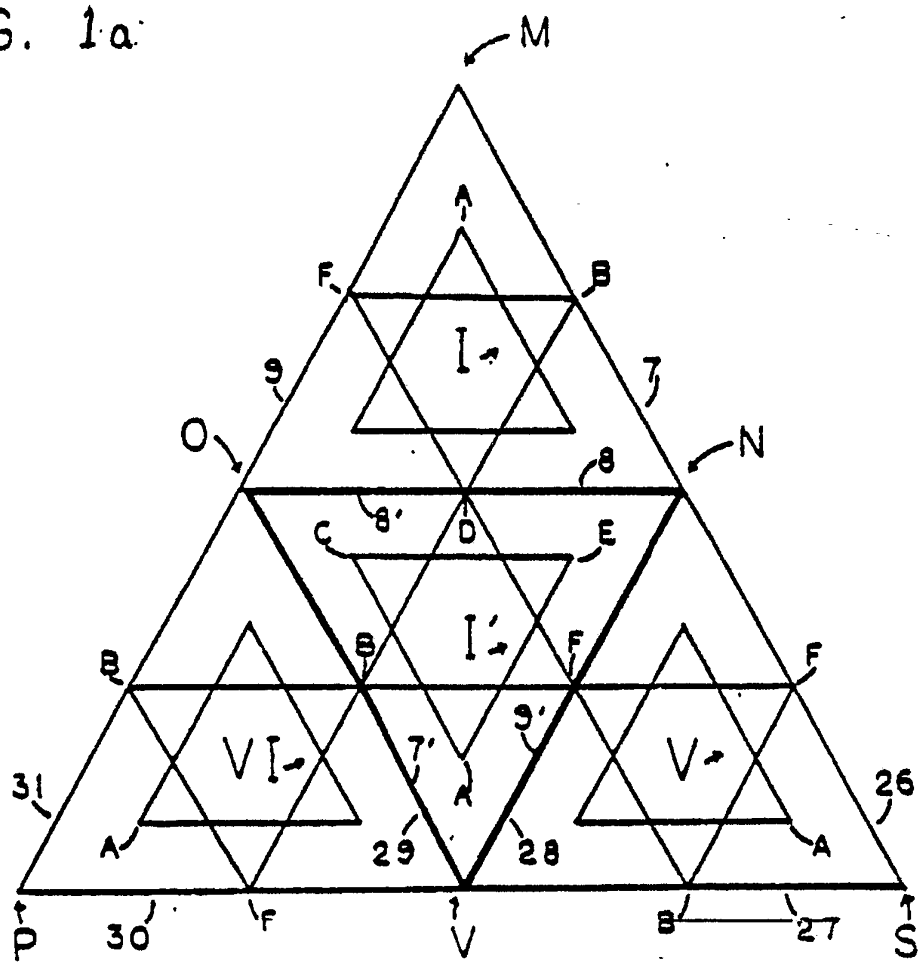
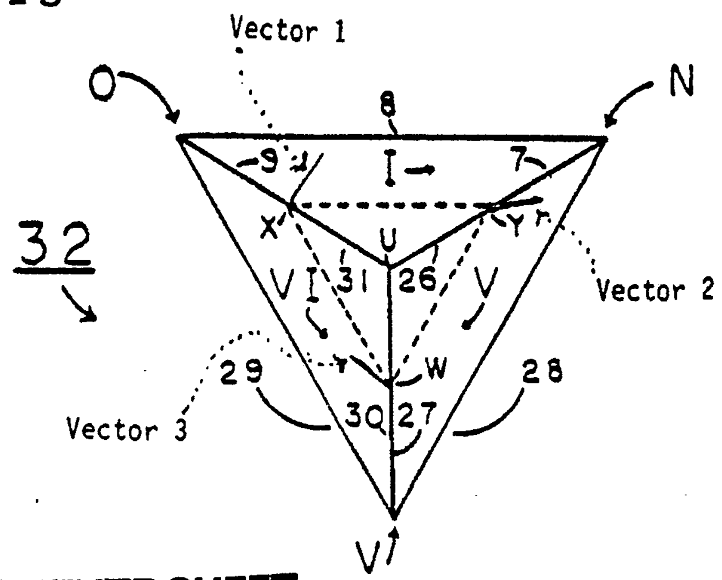

M
A
F
B
I
9
7
O
N
8
8'
C
D
E
I'
B
B
F
F
VI
V
7'
9'
31
26
A
A
A
29
28
P
30
F
V
B
27
S

FIG. 1b


Vector 1
O
8
N
9
I
7
X'
Y
U
32
VI
31
26
V
Vector 2
29
W
28
Vector 3
30
27
V

INTERNATIONAL SEARCH REPORT

International Application No PCT/US86/01805

I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all) [3]

According to International Patent Classification (IPC) or to both National Classification and IPC

INT. CL.4 G06F 1/00
U.S. CL. 364/200

II. FIELDS SEARCHED

Minimum Documentation Searched [4]

Classification System	Classification Symbols
U.S.	364/200 MS FILE 364/513, 250/253, 250/342 364/900 MS FILE

Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched [5]

III. DOCUMENTS CONSIDERED TO BE RELEVANT [14]

Category *	Citation of Document, [16] with indication, where appropriate, of the relevant passages [17]	Relevant to Claim No. [18]
Y	US, 4,533,993, (MCCANNEY ET AL), 06 AUGUST 1985	1
Y	US, 4,311,906, (FELIX ET AL), 19 JANUARY 1982	1
Y	US, 3,685,221, (MANGAN), 22 AUGUST 1972	1
Y	FR, 1,332,044, (CLAUDE) 04 JUNE 1963	1
A	US, 4,384,273, (ACKLAND ET AL) 17 MAY 1983	1
A	US, 3,978,452, (BARTON ET AL), 31 AUGUST 1972	1

* Special categories of cited documents: [15]

"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

"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

IV. CERTIFICATION

Date of the Actual Completion of the International Search [2]	Date of Mailing of this International Search Report [2]
29 OCTOBER 1986	13 NOV 1986
International Searching Authority [1]	**Signature of Authorized Officer [20]**
ISA/US	THOMAS C. LEE

Form PCT/ISA/210 (second sheet) (May 1986)