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CONTENTS

Sr. No.	TITLE & NAME OF THE AUTHOR (S)	Page No.
1.	**EFFICIENCY AND PERFORMANCE OF e-LEARNING PROJECTS IN INDIA** *SANGITA RAWAL, DR. SEEMA SHARMA & DR. U. S. PANDEY*	1
2.	**AN ADAPTIVE DECISION SUPPORT SYSTEM FOR PRODUCTION PLANNING: A CASE OF CD REPLICATOR** *SIMA SEDIGHADELI & REZA KACHOUIE*	5
3.	**CONSTRUCT THE TOURISM INTENTION MODEL OF CHINA TRAVELERS IN TAIWAN** *WEN-GOANG, YANG, CHIN-HSIANG, TSAI, JUI-YING HUNG, SU-SHIANG, LEE & HUI-HUI, LEE*	9
4.	**FINANCIAL PLANNING CHALLENGES AFFECTING IMPLEMENTATION OF THE ECONOMIC STIMULUS PROGRAMME IN EMBU COUNTY, KENYA** *PAUL NJOROGE THIGA, JUSTO MASINDE SIMIYU, ADOLPHUS WAGALA, NEBAT GALO MUGENDA & LEWIS KINYUA KATHUNI*	15
5.	**IMPACT OF ELECTRONIC COMMERCE PRACTICES ON CUSTOMER E-LOYALTY: A CASE STUDY OF PAKISTAN** *TAUSIF M. & RIAZ AHMAD*	22
6.	**SOCIAL NETWORKING IN VIRTUAL COMMUNITY CENTRES: USES AND PERCEPTION AMONG SELECTED NIGERIAN STUDENTS** *DR. SULEIMAN SALAU & NATHANIEL OGUCHE EMMANUEL*	26
7.	**EXPOSURE TO CLIMATE CHANGE RISKS: CROP INSURANCE** *DR. VENKATESH. J, DR. SEKAR. S, AARTHY.C & BALASUBRAMANIAN. M*	32
8.	**SCENARIO OF ENTERPRISE RESOURCE PLANNING IMPLEMENTATION IN SMALL AND MEDIUM SCALE ENTERPRISES** *DR. G. PANDURANGAN, R. MAGENDIRAN, L.S. SRIDHAR & R. RAJKOKILA*	35
9.	**BRAIN TUMOR SEGMENTATION USING ALGORITHMIC AND NON ALGORITHMIC APPROACH** *K.SELVANAYAKI & DR. P. KALUGASALAM*	39
10.	**EMERGING TRENDS AND OPPORTUNITIES OF GREEN MARKETING AMONG THE CORPORATE WORLD** *DR. MOHAN KUMAR. R, INITHA RINA.R & PREETHA LEENA .R*	45
11.	**DIFFUSION OF INNOVATIONS IN THE COLOUR TELEVISION INDUSTRY: A CASE STUDY OF LG INDIA** *DR. R. SATISH KUMAR, MIHIR DAS & DR. SAMIK SOME*	51
12.	**TOOLS OF CUSTOMER RELATIONSHIP MANAGEMENT – A GENERAL IDEA** *T. JOGA CHARY & CH. KARUNAKER*	56
13.	**LOGISTIC REGRESSION MODEL FOR PREDICTION OF BANKRUPTCY** *ISMAIL B & ASHWINI KUMARI*	58
14.	**INCLUSIVE GROWTH: REALTY OR MYTH IN INDIA** *DR. KALE RACHNA RAMESH*	65
15.	**A PRACTICAL TOKENIZER FOR PART-OF SPEECH TAGGING OF ENGLISH TEXT** *BHAIRAB SARMA & BIPUL SHYAM PURKAYASTHA*	69
16.	**KEY ANTECEDENTS OF FEMALE CONSUMER BUYING BEHAVIOR WITH SPECIAL REFERENCE TO COSMETICS PRODUCT** *DR. RAJAN*	72
17.	**MANAGING HUMAN ENCOUNTERS AT CLASSROOMS - A STUDY WITH SPECIAL REFERENCE TO ENGINEERING PROGRAMME, CHENNAI** *DR. B. PERCY BOSE*	77
18.	**THE IMPACT OF E-BANKING ON PERFORMANCE – A STUDY OF INDIAN NATIONALISED BANKS** *MOHD. SALEEM & MINAKSHI GARG*	80
19.	**UTILIZING FRACTAL STRUCTURES FOR THE INFORMATION ENCRYPTING PROCESS** *UDAI BHAN TRIVEDI & R C BHARTI*	85
20.	**IMPACT OF LIBERALISATION ON PRACTICES OF PUBLIC SECTOR BANKS IN INDIA** *DR. R. K. MOTWANI & SAURABH JAIN*	89
21.	**THE EFFECTIVENESS OF PERFORMANCE APPRAISAL ON ITES INDUSTRY AND ITS OUTCOME** *DR. V. SHANTHI & V. AGALYA*	92
22.	**CUSTOMERS ARE THE KING OF THE MARKET: A PRICING APPROACH BASED ON THEIR OPINION - TARGET COSTING** *SUSANTA KANRAR & DR. ASHISH KUMAR SANA*	97
23.	**WHAT DRIVE BSE AND NSE?** *MOCHI PANKAJKUMAR KANTILAL & DILIP R. VAHONIYA*	101
24.	**A CASE APPROACH TOWARDS VERTICAL INTEGRATION: DEVELOPING BUYER-SELLER RELATIONSHIPS** *SWATI GOYAL, SONU DUA & GURPREET KAUR*	108
25.	**ANALYSIS OF SOURCES OF FRUIT WASTAGES IN COLD STORAGE UNITS IN TAMILNADU** *ARIVAZHAGAN.R & GEETHA.P*	113
26.	**A NOVEL CONTRAST ENHANCEMENT METHOD BY ARBITRARILY SHAPED WAVELET TRANSFORM THROUGH HISTOGRAM EQUALIZATION** *SIBIMOL J*	119
27.	**SCOURGE OF THE INNOCENTS** *A. LINDA PRIMLYN*	124
28.	**BUILDING & TESTING MODEL IN MEASUREMENT OF INTERNAL SERVICE QUALITY IN TANCEM – A GAP ANALYSIS APPROACH** *DR. S. RAJARAM, V. P. SRIRAM & SHENBAGASURIYAN.R*	128
29.	**ORGANIZATIONAL CREATIVITY FOR COMPETITIVE EXCELLENCE** *REKHA K.A*	133
30.	**A STUDY OF STUDENT'S PERCEPTION FOR SELECTION OF ENGINEERING COLLEGE: A FACTOR ANALYSIS APPROACH** *SHWETA PANDIT & ASHIMA JOSHI*	138
	REQUEST FOR FEEDBACK	146

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CONTRIBUTIONS TO BOOKS

- Sharma T., Kwatra, G. (2008) Effectiveness of Social Advertising: A Study of Selected Campaigns, Corporate Social Responsibility, Edited by David Crowther & Nicholas Capaldi, Ashgate Research Companion to Corporate Social Responsibility, Chapter 15, pp 287-303.

JOURNAL AND OTHER ARTICLES

- Schemenner, R.W., Huber, J.C. and Cook, R.L. (1987), "Geographic Differences and the Location of New Manufacturing Facilities," Journal of Urban Economics, Vol. 21, No. 1, pp. 83-104.

CONFERENCE PAPERS

- Garg, Sambhav (2011): "Business Ethics" Paper presented at the Annual International Conference for the All India Management Association, New Delhi, India, 19–22 June.

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- Kumar S. (2011): "Customer Value: A Comparative Study of Rural and Urban Customers," Thesis, Kurukshetra University, Kurukshetra.

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UTILIZING FRACTAL STRUCTURES FOR THE INFORMATION ENCRYPTING PROCESS

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ABSTRACT

Information security is the process which describes all measures taken to prevent unauthorized use of electronic data, whether this unauthorized use takes the form of destruction, disclosure, modification, or disruption. Information security and Cryptography are interconnected and share the common services of protecting the confidentiality, integrity and availability of the information. In the encryption process, information security uses Cryptography to shift the information into the cipher form which does not allow it to be used by unauthorized personnel. Cryptography is one of the most important fields in computer security. It is a method of transferring private information and data through open network communication, so only the receiver who has the secret key can read the encrypted messages which might be documents, phone conversations, images or other form of data. To implement privacy simply by encrypting the information intended to remain secret can be achieved by using methods of Cryptography. The information must be scrambled, so that other users will not be able to access the actual information. In this paper we propose new public-key primitives based on Mandelbrot and Julia Fractal sets. The Fractal based key exchange protocol is possible because of the intrinsic connection between the Mandelbrot and Julia Fractal sets. In the proposed protocol, Mandelbrot Fractal function takes the chosen private key as the input parameter and generates the corresponding public key. Julia Fractal function is then used to calculate the shared key based on the existing private key and the received public key.

KEYWORDS
fractal structures, information encrypting process.

I. INTRODUCTION

1.1) MANDELBROT SETS

In mathematics the Mandelbrot set, named after Benoit Mandelbrot. The Mandelbrot Fractal (see Figure 1(a)) can be defined as the set of complex values of *c (Parameter Space)* for which the orbit of 0 under iteration of the complex quadratic polynomial equation (1)

$$Z_n = Z_{n-1}^2 + c\ ;\ Z_0 = 0;\ \ c, Z_{n-1} \in C; n \in Z\ .$$ remains bounded.

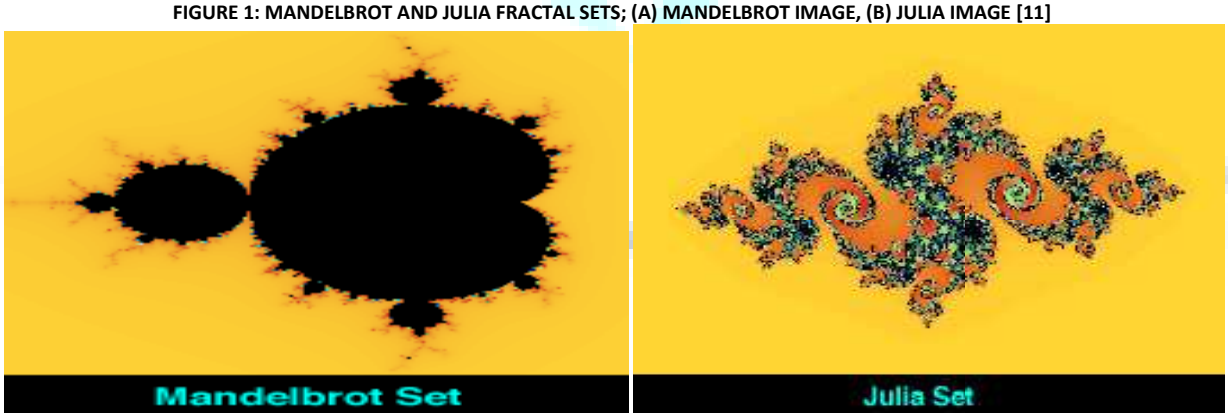
1.2) JULIA SETS

French mathematician Gaston Julia [12] investigated the iteration process of a complex function intensively, and attained the Julia set, Similar to Mandelbrot Fractal set, Julia Fractal set (see Figure 1(b)) is a set of points on a complex plane(state space) defined recursively by Equation 2.

$$Z_n = Z_{n-1}^2 + c\ ;\ \ c, Z_n \in C; n \in Z\ . \qquad (2)$$

The Julia set for parameter is defined as the boundary between those of that remain bounded after repeated iterations and those escape to infinity. The Julia set on the real axis are reflection symmetric, while those with complex parameter show rotation symmetry with an exception to c= (0, 0) see Rani and Kumar [11]. The difference between the Mandelbrot set and the Julia set is that the Mandelbrot set iterates Z^2+c with Z starting at 0 and varying c with every iteration, while Julia set iterates Z^2+c for fixed c and starting with non-zero value of Z [6, 10]. The connection between the Mandelbrot set and the Julia set is that each point c in the Mandelbrot set specifies the geometric structure of the corresponding Julia set [9].

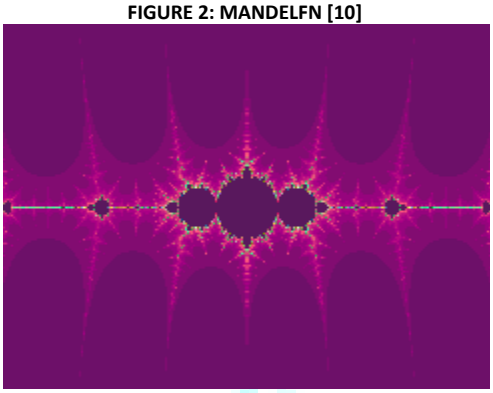
FIGURE 1: MANDELBROT AND JULIA FRACTAL SETS; (A) MANDELBROT IMAGE, (B) JULIA IMAGE [11]



II) MANDELBROT AND JULIA FRACTAL SETS KEY-EXCHANGE PROTOCOL

In this section we will describe the proposed key exchange algorithm in detail. The first step in this protocol is to generate the public key and the private key by using Mandelbrot and Julia functions. The equation used in our proposed protocol is the Mandelbrot function, "*Mandelfn*" (see Equation 4) and Julia function, "*Juliafn*" (see Equation 5). *Mandelfn* is one of the many Mandelbrot functions, and similarly *Juliafn* is a specific form of Julia functions. An image generated from the *Mandelfn* function is shown in Figure 2.

FIGURE 2: MANDELFN [10]



Z (0) = c; c,Z ε C. (3)

Z (n + 1) = c × f (Z (n)); c,Z ε C;n ε Z. (4)

It is easy to generate variation of Fractal images based on *Mandelfn* and *Juliafn* functions. For example, we can substitute the function *f ( )* in Equation 5 and 6 with some known functions such as *sin ( ), cos ( ), exp ( ),* etc., to generate different variation of the functions. However, the generated values from *Mandelfn* must always reside within the Mandelbrot set, and similarly, the values generated by the *Juliafn* must reside within the Julia set [10].

Z (n + 1) = c* f (z (n)) (5)

Z (n + 1) = c × f(Z (n)) ; Z,c ε C; n ε Z. (6)

As shown by Figure 3, Fractal key exchange protocol involves two parties, Alice and Bob. Alice must generate the public key based on her private key as describe earlier. The generated public key is then send to Bob. Bob on the other hand will do the same and send his public key to Alice. To produce the public key, we use Mandelbrot function, *Mandelfn*. For Alice, the generated public key is $Z_n e$, as describes by Equation 7 .

$$Z_n e = Z_{n-1} \times c^2 \times e; Z,c,e \in \mathbb{C}; n \in Z. \quad (7)$$

Similarly for Bob, the generated public key, $Z_k d$, is calculated by using *Madelfn* equation as shown by Equation 8.

$$Z_k d = Z_{k-1} \times c^2 \times d; Z,c,d \in \mathbb{C}; k \in Z. \quad (8)$$

Note that, it is impossible to find the private values from the published public keys, since the iteration, *n*, and the variation constant *e*, are unknown to the public. Hence, we can identify that the hard problem for the proposed Fractal key exchange is through its key selection. This is true since the complex value produces by *Mandelfn* depends on the number of iterations, *n*, as well as the variation constant, *e*, which makes the *Mandelfn* values jump path chaotically. This will prevent attack on the private values, given that *e* is being represented appropriately. We are suggesting *e* to be represented by a 128-bit value which should give 2128 possibilities for every values of *n* that are being brute force. After exchanging the public keys and executing the *Juliafn* function, both Alice and Bob will arrived at the same secret value, $(Z_n e)_k d = (Z_k d)_n e$. Both $(Z_n e)_k d$ and $(Z_k d)_n e$ are equals [1], based on a known Fractal property as shown by Equation 9.

$$c^{n-x} \times (Zkd)_n e = c^{k-x} \times (Z_n e)_k d; \quad (9)$$

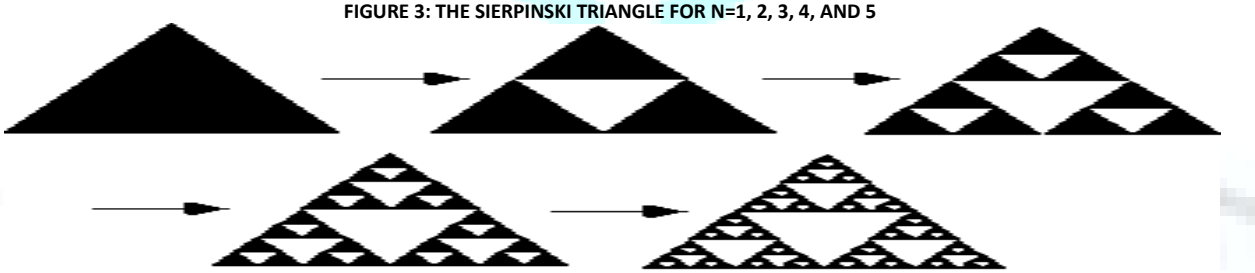
$$Z,c,e,d \in \mathbb{C}; n,x,k \in Z.$$

III) THE SIERPINSKI TRIANGLE FOR ENCRYPTION PURPOSE

The Sierpinski triangle **S** may also be constructed using a deterministic rather than a random algorithm. To see this, we begin with any triangle. Then we use the midpoints of each side as the vertices of a new triangle, which we then remove from the original. This leaves us with three triangles, each of which has area exactly one-fourth of the original area. Also, each remaining triangle is similar to the original.

Now we continue (or iterate) this process. From each remaining triangle we remove the "middle" leaving behind three smaller triangles each of which has dimensions one-half of those of the parent triangle (and one-fourth of the original triangle). Clearly, 9 triangles remain at this stage. At the next iteration, 27 small triangles, then 81, and, at the Nth stage, 3^N small triangles remain. (See Figure 3.)

FIGURE 3: THE SIERPINSKI TRIANGLE FOR N=1, 2, 3, 4, AND 5



The algorithm of generation of Sierpinski Triangle

Void SierTriangle(an equilateral triangle)

If (the triangle is too small)

Stop.

Else

Connect the mid point of the sides with line segments. Color the middle triangle with different color.

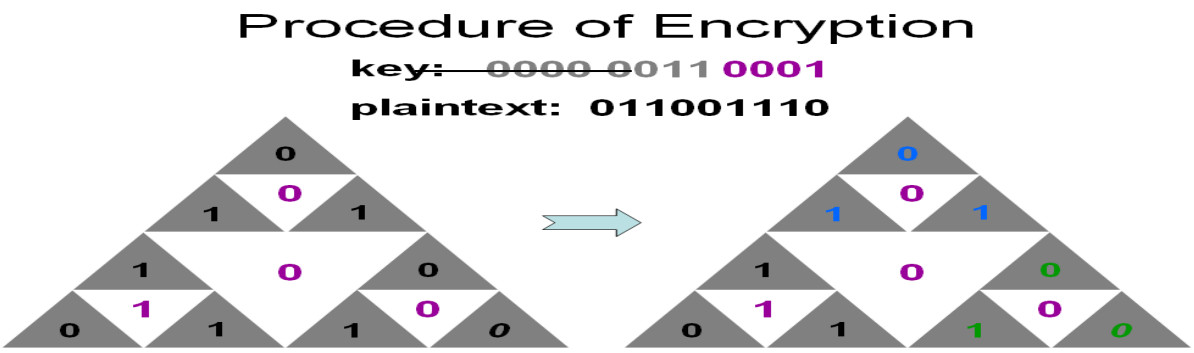
SierTriangle(top triangle)

SierTriangle(bottom left triangle)

SierTriangle(bottom right triangle) //**Figure 4: Algorithm to generate Sierpinski Triangle**

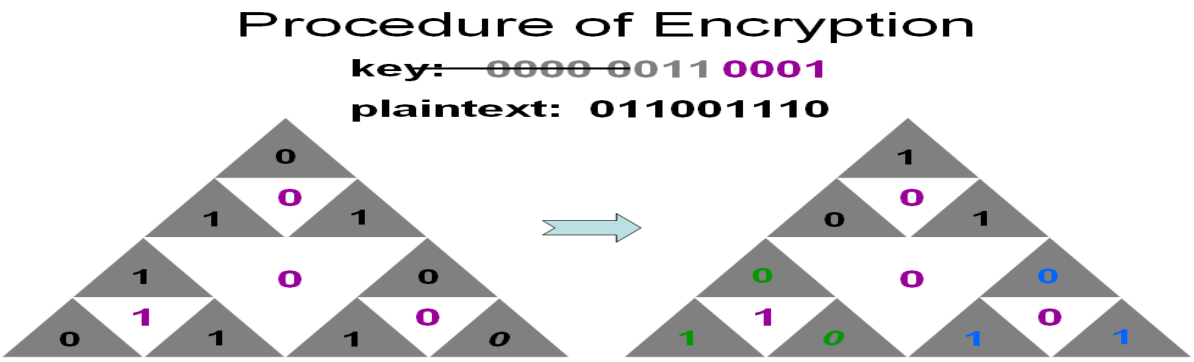
The figure 5 shows I step of encryption by using Sierpinski Triangle. To show the process let us take key as 0001 and plaintext 011001110. The dimension of Sierpinski Triangle should match the key size. The key should arrange in white portion of triangle in CENTER, TOP, LEFT and RIGHT order. The plain text should be arranged in order of generation of Sierpinski Triangle by algorithm shown in figure 4(in black portion triangle) i.e. SierTriangle (top triangle), SierTriangle (bottom left triangle), and SierTriangle (bottom right triangle). The order of arrangement of plaintext with in sub triangle should be TOP, LEFT and RIGHT [7].

FIGURE 5



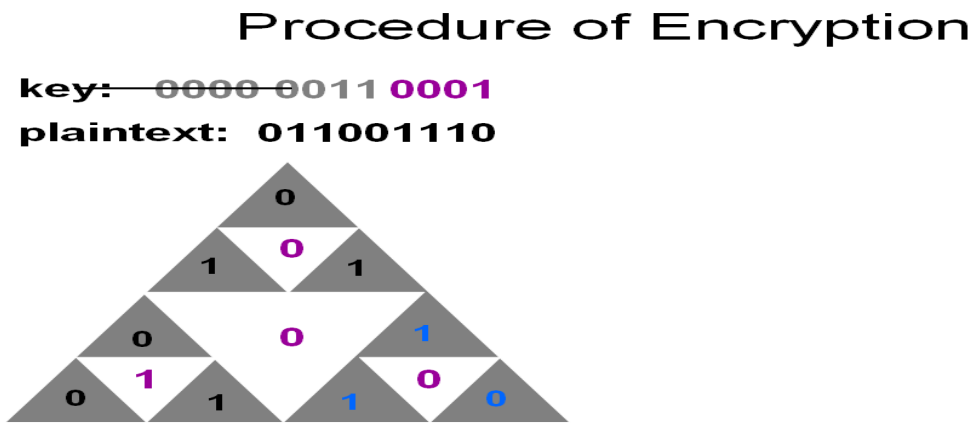
In the II step plaintext content of LEFT triangle should be replace by respective content of TOP triangle, plaintext content of RIGHT triangle should be replace by respective content of LEFT triangle , plaintext content of TOP triangle should be replace by respective content of RIGHT triangle.
Figure 6 shows the value of Sierpinski Triangle after the second step.

FIGURE 6



In the step III The content of TOP, LEFT and RIGHT triangle should rotate by one position in clock wise direction if the corresponding member of key field is 0 (White triangle element) else content of TOP, LEFT and RIGHT triangle should rotate by two position in clock wise direction if the corresponding member of key field is 1 (White triangle element).

FIGURE 6



In the step IV read the content in TOP, LEFT, and RIGHT order to get the Cipher text.
Plain text **011001110** → **cipher text** **011101010**

IV) CONCLUSION

This paper has focus on the how the Mandelbrot and Julia sets can be utilize for the key exchange procedure between sender and receiver. The Fractal based key exchange protocol is made possible because of the intrinsic connection between the Mandelbrot and Julia Fractal sets.
The second half of the paper focus on how, Sierpinski Triangle Fractals can be used for converting Plaintext into cipher text. So, together these two concepts can facilitate the key exchange as well as message encryption.

V) REFERENCES

[1] PhD Thesis on A New Approach To Public-Key Cryptosystem Based On Mandelbrot And Julia Fractal Sets By Mohammad Ahmad A. Alia University Sains Malaysia 2008.

[2] W. Stallings, "Cryptography and Network Security Principles and Practices,"*Pearson Education*, 3rd edition.
[3] Gilbert Helmberg "Getting Acquainted with Fractals"
[4] Mohammad Ahmad Alia and Azman Bin Samsudin, "New Key Exchange Protocol Based on Mandelbrot and Julia Fractal Sets", International Journal of Computer Science and Network Security, Vol. 7, No. 2, February 2007
[5].Douady A., "Julia Sets and the Mandelbrot Set", In the Beauty of Fractals: Images of Complex Dynamical Systems (Ed. H.-O. Peitgen and D. H. Richter). Berlin: Springer- Verlag, pp. 161, 1986.
[6] P. Bourke, "An Introduction to Fractals, "*http://local.wasp.uwa.edu.au/~pbourke/fractals/fracintro/*, May 1991
[7] PENG Hai, GUO Qing-ping, Computer Processing & Distributing Laboratory, Wuhan University of Technology **"**A FRACTAL ENCRYPTION ALGORITHM"
[8] MANDELBROT, B. B., Fractals nad chaos: the Mandelbrot set and beyond. New York: Springer, 2004. 308 s. ISBN 0-387-20158-0.
[9] M. C. Taylor, J. Louvet, "Sci.fractals FAQ," ComputingServices Mount Allison University Sackville, Canada, 1998.
[10] N. Giffin, "Fractint," *TRIUMF project at the University of British Columbia Campus in Vancouver B.C. Canada***,** 2006.
[11] Rani, M.; Kumar, V.: Superior Julia set, J Korea Soc Math Edu Series D: Res Math Edu 2004; 8(4), 261-277.
[12] Julia, G.: Sur 1' iteration des functions rationnelles, J Math Pure Appl., 1918; 8, 47-245

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