IOP Publishing

Get new quote

The open access IOP Conference Series provides a fast, versatile and cost-effective proceedings publication service for your conference. Key publishing subject areas include: physics, materials science, environmental science, bioscience, engineering, computational science and mathematics.

We are celebrating the 10th anniversary of IOP Conference Series and, to mark this occasion, we have put together a collection of the most influential work to have been presented at recent conferences. We want to thank conference organizers, authors, referees and readers for working with us in the past ten years. Browse the collection here.

View published volumes | Forthcoming volumes | Testimonials

IOP Conf. Series: Journal of Physics: Conf. Series 1338 (2019) 011001 doi:10.1088/1742-6596/1338/1/011001

Preface

The International Conference on Applied Sciences Mathematics and Informatics (ICASMI) is an annual conference hosted by University of Lampung that brings together academics, scholars and researchers from around the world to meet and exchange the latest ideas and discuss issues concerning all fields of sciences, mathematics, informatics and their application. It also allows representatives of industry, government employers and postgraduate students to have an opportunity to discuss with experts on some issues they concern.

The theme for ICASMI 2018: “The Contribution of Sciences on Sustainable Valorization of Natural Resources” is to highlight the role of sciences tackling problems and creating synergies with other fields on sustainable valorization of natural resources. The conference will provide researchers and scientists from mathematics and computer science, researchers from various application areas such as physics, chemistry, life sciences, and engineering, as well as in education and social fields, to discuss problems and solutions in the area, to identify new issues, and to shape future directions for research.

We would like to acknowledge all of those who have supported ICASMI 2018. Each individual and institutional help were very important for the success of this conference. Especially we would like to thank the organizing committee for their valuable advices in the organization and helpful peer review of the papers.

We hope that ICASMI 2018 will be a forum for excellent discussions that will put forward new ideas and promote collaborative researches. We are sure that the proceedings will serve as an important research source of references and the knowledge, which will lead to not only scientific and engineering progress but also other new products and processes.

Dr. Junaidi, M.Sc.

Peer review statement

All papers published in this volume of *Journal of Physics: Conference Series* have been peer reviewed through processes administered by the proceedings Editors. Reviews were conducted by expert referees to the professional and scientific standards expected of a proceedings journal published by IOP Publishing.

(https://icasmi.fmipa.unila.ac.id/2018/)

Home (https://icasmi.fmipa.unila.ac.id/2018) / Committee

Committee

Advisory Board

Prof. Dr. Ir. Hasriadi Mat Akin, M.P., University of Lampung, Indonesia
Prof. Ponnadurai Ramasami, University of Mauritius, Mauritius
Prof. Célestin C. Kokonendji, University of Bourgogne Franche-Comté, France
Prof. Savitree Limtong, Kasetsart University, Thailand
Prof. Teddy Mantoro, Sampoerna University, Indonesia
Prof. Dr. Eng. Khairurrijal, Bandung Institute of Technology, Indonesia
Prof. Wannapong Triampo, Mahidol University, Thailand
Prof. Dr. H. Bujang Rahman, M.Si., University of Lampung, Indonesia
Prof. Dr. Ir. Muhammad Kamal, M.Sc., University of Lampung, Indonesia
Prof. Dr. Karomani, M.Si., University of Lampung, Indonesia
Prof. Dr. Mahatma Kufepaksi, M.Sc., University of Lampung, Indonesia

Steering Committee

Prof. Warsito, S.Si., DEA.,Ph.D., University of Lampung, Indonesia
Prof. Sutopo Hadi, University of Lampung, Indonesia
Prof. Wasinton Simanjuntak, Ph.D., University of Lampung, Indonesia
Prof. Posman Manurung, University of Lampung, Indonesia
Dr. G. Nugroho Susanto, M. Sc, University of Lampung, Indonesia
Prof. Wamiliana, Ph.D, University of Lampung, Indonesia
Dr. Eng. Admi Syarif, University of Lampung, Indonesia
Dian Kurniasari, M.Sc., University of Lampung, Indonesia
Drs. Suratman, M.Sc., University of Lampung, Indonesia
Ir. Warsono, M.S., Ph.D., University of Lampung, Indonesia
Dr. Suripto Dwi Yuwono, M.T., University of Lampung, Indonesia
Dr. Nuning Nurcahyani, M.Sc., University of Lampung, Indonesia
Arif Surtono, S.Si., M.Si., M.Eng., University of Lampung, Indonesia
Dr. Kurnia Muludi, M.S.Sc., University of Lampung, Indonesia

Organizing Committee

Junaidi – Conference Chair
Heri Satria – Secretary 1
Leni Rumiyanti – Secretary 2
Gina Dania Pratami – Treasurer 1
Mita Rilyanti – Treasurer 2

Secretariat

Nurhasanah
Khoirin Nisa
Muhammad Iqbal
Agus Riyanto

Information Management System

Favorisen R. Lumbanraja
Didik Kurniawan
Akmal Junaidi
Rizky Prabowo
Ardiansyah

Conference event

Priyambodo
Elly Lestari Rustiati
Notiragayu
Ni Luh Gede Ratna Juliasih
Anie Rose Irawati
Aang Nuryaman
Gurum Ahmad Pauzi
Hartoyo

Appurtenance

Agung Abadi Kiswandono
Tristiyanto
Amanto
Amir Supriyanto

Logistics

Widiarti
Yuli Ambarwati
Yunda Heningtyas

Sponsorship

Diky Hidayat
Tugiyono

Documentation

Ali Suhendra

Post Views: 948

KEMENTERIAN RISET, TEKNOLOGI DAN PENDIDIKAN TINGGI
UNIVERSITAS LAMPUNG
Jl. Prof. Dr. Sumantri Brojonegoro No.1 Bandar Lampung 35145
Telepon/Fax (0721) 701609, 702673, 702971, 703475, 701252 Fax: (0721) 702767
www.unila.ac.id

KEPUTUSAN
REKTOR UNIVERSITAS LAMPUNG
NOMOR 1993/UN26/DL/2018

TENTANG
PENGANGKATAN TIM REVIEWER 2ND INTERNATIONAL CONFERENCE ON APPLIED SCIENCES MATHEMATICS AND INFORMATICS "THE CONTRIBUTION OF SCIENCES ON SUSTAINABLE VALORIZATION OF NATURAL RESOURCES"

REKTOR UNIVERSITAS LAMPUNG

Menimbang :
a. bahwa untuk ketertiban dan kelancaran pelaksanaan kegiatan 2nd International Conference on Applied Science Mathematics and Informatics "The Contribution of Sciences on Sustainable Valorization of Natural Resources" pada tanggal 9-11 Agustus 2018 di Universitas Lampung, dipandang perlu dibentuk susunan tim reviewer makalah;
b. bahwa untuk itu perlu ditetapkan dengan Keputusan Rektor;

Mengingat :
1. Undang-Undang Nomor 20 Tahun 2003 tentang Sistem Pendidikan Nasional;
2. Undang-Undang Nomor 12 Tahun 2012 tentang Pendidikan Tinggi;
3. Undang-Undang Nomor 5 Tahun 2014 tentang Aparatur Sipil Negara;
4. Peraturan Pemerintah Nomor 4 Tahun 2014 tentang Penyelenggaraan Pendidikan Tinggi dan Pengelolaan Perguruan Tinggi;
5. Keputusan Presiden Nomor 73 Tahun 1966 tentang Pendirian Universitas Lampung;
6. Peraturan Menteri Pendidikan dan Kebudayaan Nomor 72 Tahun 2014 tentang Organisasi dan Tata Kerja Universitas Lampung;
7. Peraturan Menteri Riset, Teknologi, dan Pendidikan Tinggi Nomor 6 Tahun 2015 tentang Statuta Universitas Lampung;
8. Keputusan Menteri Riset, Teknologi, dan Pendidikan Tinggi Nomor 335/M/KP/XI/2015 tentang Pemberhentian dan Pengangkatan Rektor Universitas Lampung;

MEMUTUSKAN:

Menetapkan	:	KEPUTUSAN REKTOR UNIVERSITAS LAMPUNG TENTANG PENGANGKATAN TIM REVIEWER 2ND INTERNATIONAL CONFERENCE ON APPLIED SCIENCES MATHEMATICS AND INFORMATICS "THE CONTRIBUTION OF SCIENCES ON SUSTAINABLE VALORIZATION OF NATURAL RESOURCES".
KESATU	:	Mengangkat Tim Reviewer 2nd International Conference on Applied Science Mathematics and Informatics "The Contribution of Sciences on Sustainable Valorization of Natural Resources" dengan susunan personalia sebagaimana tercantum dalam lampiran keputusan ini.
KEDUA	:	Tim Reviewer 2nd International Conference on Applied Science Mathematics and Informatics "The Contribution of Sciences on Sustainable Valorization of Natural Resources" bertugas untuk mereview semua paper atau makalah yang masuk ke ICASMI.
KETIGA	:	Tim Reviewer 2nd International Conference on Applied Science Mathematics and Informatics "The Contribution of Sciences on Sustainable Valorization of Natural Resources" dalam melaksanakan tugasnya bertanggung jawab kepada rektor.
KEEMPAT	:	Keputusan ini mulai berlaku sejak tanggal ditetapkan dan apabila di kemudian hari terdapat kekeliruan, akan diadakan perbaikan sebagaimana mestinya.

Ditetapkan di : Bandar Lampung
Pada Tanggal : 7 Agustus 2018
REKTOR UNIVERSITAS LAMPUNG

HASRIADI MAT AKIN
NIP 195706291986031002

Tembusan:
1. Para Wakil Rektor,
2. Para Dekan
Universitas Lampung

LAMPIRAN KEPUTUSAN REKTOR UNIVERSITAS LAMPUNG
NOMOR : /UN26/DT/2018
TANGGAL :
TENTANG : PENGANGKATAN TIM REVIEWER 2ND INTERNATIONAL CONFERENCE ON APPLIED SCIENCE MATHEMATICS AND INFORMATICS "THE CONTRIBUTION OF SCIENCES ON SUSTAINABLE VALORIZATION OF NATURAL RESOURCES"

No	Nama Reviewer	Bidang Keilmuan
1	Prof. Drs. Wasinton Simanjuntak, M.Sc., Ph.D.	Kimia
2	Prof. Suharso, Ph.D.	Kimia
3	Prof. Dr. Buhani, S.Pd., M.Si.	Kimia
4	Dr. Rudi TM Situmeang, M.Sc.	Kimia
5	Prof. Dr. Yandri AS, M.S	Kimia
6	Prof. Dr. Tati Suhartati, M.S.	Kimia
7	Prof. Drs. Posman Manurung, M.Si., Ph.D.	Fisika
8	Prof. Simon Sembiring, Ph.D.	Fisika
9	Dra. Dwi Asmi, M.S., Ph.D.	Fisika
10	Dr. Yanti Yulianti, M.Si.	Fisika
11	Prof. Dra. Wamiliana, M.A., Ph.D.	Matematika
12	Dr. Asmiati, M.Si	Matematika
13	Prof. Mustofa Usman, Ph.D.	Matematika
14	Dr. Khoirin Nisa, M.Si.	Matematika
15	Dr. La Zakaria, M.Sc.	Matematika
16	Dr. rer.nat. Akmal Junaidi, M.Sc.	Ilmu Komputer
17	Dr. Eng. Admi Syarif	Ilmu Komputer
18	Dr. Ir. Kurnia Muludi, M.S.Sc.	Ilmu Komputer
19	Tristiyanto, S.Kom., M.I.S., Ph.D.	Ilmu Komputer
20	Kochrmah Agustrina, S.U., Ph.D.	Biologi
21	Dr. Nismah Nukmal, M.S.	Biologi
22	Dr. Bambang Irawan, M.Sc.	Biologi
23	Dr. G. Nugroho Susanto, M.Sc.	Biologi

REKTOR UNIVERSITAS LAMPUNG

HASRIADI MAT AKIN
NIP. 195706291986031002

(https://icasmi.fmipa.unila.ac.id/2018/)

Home (https://icasmi.fmipa.unila.ac.id/2018) / Important Dates

Important Dates

Registration Schedule

Deadline for abstract submission	July 22th, 2018
Notification of acceptance	June 10th - July 26th, 2018
Registration payment (presenter)	August 2nd, 2018
Registration payment deadline (non presenter)	August 2nd, 2018
Conference	August 9th - 11th, 2018
Deadline for full paper	August 31st, 2018

Conference Schedule

- August 9, 2018

Time	Activities
07.30 am	Registration
08.30 am	Opening Ceremony
08.40 am	Indonesian National Anthem
08.45 am	Al-Qur'an Recitation
08.55 am	Traditional Dance

(https://icasmi.fmipa.unila.ac.id/2018/)

Time	Activities
	Poster Session
11.30 pm	Lunch Break
01.00 pm	**Parallel Session 4** Room A: Chemistry and Applied Chemistry Room B: Biology and Applied Biology Room C: Mathematics and Applied Mathematics Room D: Informatics and Computer Science Room E: Physics and Applied Physics
03.00 pm	Coffee Break
03.15 pm	**Parallel Session 5** Room A: Chemistry and Applied Chemistry Room B: Biology and Applied Biology Room C: Mathematics and Applied Mathematics Room D: Informatics and Computer Science Room E: Physics and Applied Physics
04.15 pm	Photo session & Closing remark

Detail Parallel and Poster Session (http://icasmi.fmipa.unila.ac.id/2018/wp-content/uploads/2018/08/PARALLEL-SESSION.pdf)

Table of contents

Volume 1338

2019

The 2nd International Conference on Applied Sciences Mathematics and Informatics 9–11 August 2018, Bandar Lampung, Indonesia

Accepted papers received: 29 August 2019

Published online: 01 October 2019

Open all abstracts

Preface

Papers

Chemistry

Informatics

Journal of Physics: Conference Series

Country United Kingdom - SIR Ranking of United Kingdom

Subject Area and Category Physics and Astronomy
Physics and Astronomy (miscellaneous)

Publisher Institute of Physics

Publication type Journals

ISSN 17426588, 17426596

Coverage 2005-ongoing

Scope From 1 January 2010, IOP Publishing"s open access proceedings titles no longer require authors to sign and submit copyright forms. For the following titles •Journal of Physics: Conference Series •IOP Conference Series: Materials Science and Engineering •IOP Conference Series: Earth and Environmental Science assignment of copyright forms are being replaced by a publishing licence under which authors retain their copyright. Please note that our regular journals are unaffected by this change.

Homepage

How to publish in this journal

65

H Index

← Show this widget in your own website

Just copy the code below and paste within your html code:

<a href="https://www.scimag

Jnana Ranjan Senapati 2 weeks ago

I have a publication in Journal of Physics: conference series. Whether it will be considered as a journal or conference proceeding ?

reply

ahmed abed 1 week ago

dear Jnana Ranjan Senapati
as shown in in the Publication type (upper the page)
it is JOURNAL

Journal of Physics: Conference Series

PAPER • **OPEN ACCESS**

The Implementationof Digital Text Coding Algorithm Through A Three Dimensional Mapping Derived From Generalized -mKdV Equation Using Mathematica

The Implementationof Digital Text Coding Algorithm Through A Three Dimensional Mapping Derived From Generalized ΔΔ-mKdV Equation Using Mathematica

Notiragayu[1] **and L Zakaria**[1]

[1] Mathematics Department, University of Lampung, Bandar Lampung, Indonesia

Abstract. Encryption-decryption algorithm using a mapping can be done for encoding a digital text, such as two dimensional mapping ΔΔ-sine Gordon equation. In this article, we will be given an encryption-decryption algorithm to a digital text through a three dimensional mapping that derived from the generalized ΔΔ-mKdV equation. Implementation of Encryption-decryption algorithm in this article using MATHEMATICA.

1. Introduction

Cryptography is an attempt to secure digital data files (etc. text and images). Cryptography, based on security keys, can be classified into two types of keys, symmetric keys and asymmetric keys [1].

An efficient and effective encryption-decryption algorithm is a necessity in cryptography for data security. A simple encryption-description algorithm is implemented into a computer programming and produces a high degree of difficulty in finding the security key for opening the data is an absolute thing in Cryptography. Encryption-decryption algorithm which involves mathematics in it can be found in ElGamal's article (1985) and the articles in the reference [2].

Among Cryptographic encryption-decryption algorithms that use mathematical concepts, there is a Cryptographic encoding algorithm that involves mapping. For encoding in an image for example, Rinaldi (2012) has introduced the use of Arnold Cat Map (ACM) linear mapping [3]. Meanwhile, Arinten and Hidayat (2017) use Logistic Map (LM). Likewise with Ronsen, Arwin, and Indra (2014), they used ACM and Nonlinear Choatic Algorithm (NCA) in coding for an image [4,5]. Thus a mapping can be used as a means of building cryptographic encoding for a digital data (image).

With regard to digital text data, popular cryptographic algorithms used are public key algorithms, commonly referred to as asymmetric keys, for example the ElGamal public key [6]. While the use of a mapping for cryptographic algorithms text data is relatively little published.

In this article, we will discuss an application of map in cryptographic algorithms for text data. The mapping is a part of the nonlinear mapping derived from a generalized traveling wave solution ΔΔ-mKdV [7].

This article is divided into four sections. In the first section an illustration of a descriptive algorithm is provided for cryptographic coding of text data using a 2-dimensional periodic nonlinear method. The second part, in the form of case studies, discusses cryptographic algorithms of text data using 2-dimensional mapping derived from the equation of a generalized traveling wave solution ΔΔ-sine Gordon. In the third part, the implementation of the cryptographic algorithm of text data into the Mathematic programming language. In the fourth section, the conclusions are briefly described in the results obtained in the previous section.

2. Encryption-Decryption Algorithm For Digital Text Submission Using Mapping:An Ilustration

Consider the following nonlinear mapping:

$$\boldsymbol{\gamma}_{n\ \ 1} \quad \mathbf{g}_{\boldsymbol{\theta}}(\boldsymbol{\gamma}_n) \tag{1}$$

where

$$\mathbf{g}_{\boldsymbol{\theta}}: \quad \mathbb{R}^2 \qquad\qquad \mathbb{R}^2$$

$$(x, y) \quad \mapsto \quad \frac{\quad}{x\,y}, \quad x \quad .$$

It can be examined that equation (1) is a 3-periodic nonlinear mapping with the parameter values and set as any but not zero.

Example:

Consider the following text data.

FromWolfram: Mathematica's ex extensive base of state-of-the-art algorithms, efficient handling of very long integers, and powerful built-in language make it uniquely suited to both research and implementation of cryptographic number theory.

We are coding the text data using mapping (1) whose symmetrical key is selected from and . Descriptively, the encryption-decryption algorithm for example text like this can be done in the following way.

2.1. Encryption stage

1. Grouping Text into two parts, for example parts $x(n)$ and $y(n)$ with $n \quad N$ are the values of numeric data associated with text data. And assume the length of the text data l is the same that is $l(x) \quad l(y) \quad m \quad \mathbb{N}$.
2. Convert text data to numeric data. The ASCII code can be used or uses a self-made encoding.
3. Do the mapping iteration process as much as r times with the provisions of $g^0 \quad g^r; r \quad \mathbb{N}$.
4. Select the parameter value $, \quad 0$ and make it as the key value.

2.2. Decryption Stages

1. Reuse the parameter value $, \quad 0$ which is the key value at encryption.
2. Perform the mapping iteration process provided until it reaches the r iteration, that is $g^r; r \quad \mathbb{N}$.
3. Convert numeric data into text data.
4. Finish.

The implementation of the descriptive algorithm above using Mathematica is given in the next section.

3. Digital Text Description-Encryption Algorithm Using A Mapping Derived From Generalized ΔΔ-mKdV Equation

3.1. The 2-Dimensional Periodic Mapping Formulation Derived from Generalized ΔΔ-mKdV Equation

In this section, we will follow a technique for a generalized sine-Gordon equation (see [8]).

Look at the family of four mapping parameters derived from the generalized *ΔΔ-mKdV* equation follows:

$$ {}_1V_{l,m}V_{l,m\ 1} \quad {}_2V_{l\ 1,m}V_{l\ 1,m\ 1} \quad {}_3V_{l,m}V_{l\ 1,m} \quad {}_4V_{l,m\ 1}V_{l\ 1,m\ 1} \quad 0, \qquad (2)$$

with ${}_1 \quad {}_1\ {}_2p$, ${}_2 \quad {}_4\ {}_2p$, ${}_3 \quad {}_2\ {}_1q$ and ${}_4 \quad {}_2\ {}_4q$.
Using the following transformation

$$V_{l,m} \quad V_n \text{ where } n \quad z_1l \quad z_2m,$$

where the parameter values of z_1 and z_2 are relatively prime integers, we can reduce the form of the current wave solution (2), namely

$$ {}_1V_nV_{n\ z_2} \quad {}_2V_{n\ z_1}V_{n\ z_1\ z_2} \quad {}_3V_nV_{n\ z_1} \quad {}_4V_{n\ z_2}V_{n\ z_1\ z_2} \quad 0 \qquad (3)$$

Equation (3) is a form of traveling wave solution from *ΔΔ-mKdV*. It can be examined that the equation (3) is invariant for a transformation $z_1™ \quad z_1, p™ \quad p,$ and $z_1š \quad z_2$. Besides that it also fulfills the periodic nature, namely $i \quad z_2, j \quad z_1$. Equation (3) is equivalent to mapping

$$\begin{aligned} V'_{z_1\ z_2\ 1} &\quad \frac{V_0 \quad {}_3V_{z_1} \quad {}_1V_{z_2}}{{}_4V_{z_2} \quad {}_2V_{z_1}} \\ V'_{z_1\ z_2\ 2} &\quad V_{z_1\ z_2\ 1} \\ &\vdots \\ V'_1 &\quad V_2 \\ V'_0 &\quad V_1\% \end{aligned} \qquad (4)$$

Select $z_1 \quad 1$ and $z_2 \quad 2$. The third order difference equation of equation (4) can be stated as follows:

$$ {}_1V_nV_{n\ 2} \quad {}_2V_{n\ 1}V_{n\ 3} \quad {}_3V_nV_{n\ 1} \quad {}_4V_{n\ 2}V_{n\ 3} \quad 0$$

which is equivalent to the following three-dimensional mapping:

$$\begin{aligned} V_{n\ 2} &\quad \frac{V_n \quad {}_3V_{n\ 2} \quad {}_1V_{n\ 1}}{{}_4V_{n\ 1} \quad {}_2V_{n\ 2}} \\ V_{n\ 1} &\quad V_{n\ 2} \\ V_n &\quad V_{n\ 1} \end{aligned} \qquad (5)$$

The equation in (5) is usually given a three-dimensional mapping derived from the generalized **ΔΔ-***mKdV* equation.

Look at equation (5). Suppose that $\boldsymbol{\zeta}_n$ is a line in $\mathbb{R}^2$ that is defined as

$$\boldsymbol{\zeta}_n \quad \begin{matrix} \dfrac{V_{n\ 2}}{V_{n\ 1}} \\ \dfrac{V_{n\ 1}}{V_n} \end{matrix}$$

Suppose that $\boldsymbol{\theta}$ is a parameter vector in $\mathbb{R}^4$: $({}_1, {}_2, {}_3, {}_4)$. Therefore, three-dimensional statements can be reduced to a two-dimensional mapping, namely:

$$\boldsymbol{\zeta}_{n\ 1} \quad \mathbf{g}_{\boldsymbol{\theta}}(\boldsymbol{\zeta}_n)$$

where

$$\mathbf{g}_{\boldsymbol{\theta}} : \quad \mathbb{R}^2 \qquad\qquad \mathbb{R}^2$$
$$(x, y) \quad \mapsto \quad \frac{1}{xy}\frac{{}_3x \quad {}_1}{{}_2x \quad {}_4}, x \quad . \tag{6}$$

where $y \quad \frac{V_{n\ 1}}{V_n}$ and $x \quad \frac{V_{n\ 2}}{V_{n\ 1}}$. It can be checked that the mapping in equation (6) has an integral (there is a function $S : \mathbb{R}^2 \quad \mathbb{R}$ so that $S(\boldsymbol{\zeta}_{n\ 1}) \quad S(\boldsymbol{\zeta}_n)$ for all $n \quad \mathbb{N}$) [8]. If $\frac{1}{4}$, $\frac{2}{4}$, and $\frac{3}{1}$, then the map in equation (6) can be written as

$$\mathbf{g}_{\ ,\ ,} \ : \quad \mathbb{R}^2 \qquad\qquad \mathbb{R}^2$$
$$(x, y) \quad \mapsto \quad \frac{1}{xy}\frac{x}{x \quad 1}, x \quad . \tag{7}$$

3.2. Implementation of Digital Text Data Encryption Algorithms Based on 2-Dimensional Mapping Using Mathematica

To implement a cryptographic algorithm into a computer program, a number of software can be used, such as ***Matlab*** and ***Mathematica***. In this article, we will use ***Mathematica*** that its rules and technical writing of this program in full in a reference written by Shifrin (2008) [9].

Look at the descriptive algorithms presented in section two. Against the text and 4-periodic mapping given in that section, the implementation of algorithms using Mathematica is as follows.

```
str1=”FromWolfram:Mathematica’s extensivebaseofstate-of-the-artalgorithms,
    efficienthandlingofverylongintegers,”;
str2=”andpowerfulbuilt-inlanguagemakeituniquelysuitedtobothresearchand
    implementationofcryptographicnumbertheory.”;
StringLength[str1]
StringLength[str2]
A=ToCharacterCode[str1];
B=ToCharacterCode[str2];
AccountingForm[Grid[Partition[A,10]]] ;
AccountingForm[Grid[Partition[B,10]]]
x=A;y=B;r=3;α=0.0001523;          8.1037277
```

*THIS SECTION IS A SUBRUTIN PROGRAM NAMED **coding1** FOR ITERATION PROCESSES g (A, B) TO THE r- ITERATION.*

```
xx=SetPrecision[coding1[[r−1,2]],10];
yy=SetPrecision[coding1[[r−1,1]],10];
AccountingForm[Grid[Partition[xx,5]]] ;
AccountingForm[Grid[Partition[yy,5]]] ;
```

IOP Conf. Series: Journal of Physics: Conf. Series 1338 (2019) 012041 doi:10.1088/1742-6596/1338/1/012041

*THIS PART IS A SUBRUTIN PROGRAM NAMED **recoding1** FOR ITERATION PROCESSES g^{-1} (AA, BB) TO R-ITERATION.*

```
Flatten[FromCharacterCode[Round[recoding1[[r −1]]]]]
```

Figure 1. Conversion results of text data *A* (left) and *B* (right) to numerical data before the mapping iteration process is carried out (g^0).

Figure 1 shows the result of the conversion of program outputs text data into numerical data using ASCII code (based on g^0). Another output of the program, for parameter values 0.0001523 and 8.1037277 , we have the following numerical data.

Figure 2. The results of the conversion of text data to numeric data with the choice of parameter values 0.0001523 and 8.1037277 , after the iteration of the mapping (7) process is carried out on g^2

3.3. Encryption-Description Algorithm For Setting Digital Text Using Mapping Generalized ΔΔ-mKdV Equation

Review the implementation of the algorithm using Mathematica which was given in the previous section. By using the transparent properties found in mapping (6), the periodic mapping iteration process can be replaced by an iteration invers mapping process, namely:

*THIS SECTION IS A SUBRUTIN OF NAMED **recoding1** PROGRAMS*
FOR ITERATION PROCESSES g^{-1} (AA, BB) TO r-ITERATION.

Flatten[FromCharacterCode[Round[recoding1[[r −1]]]]].

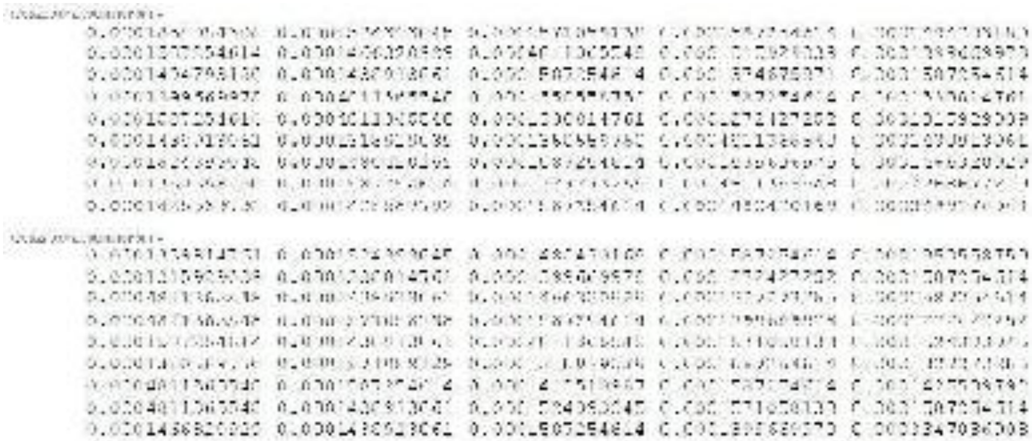

Figure 3. The results of the conversion of text data to numeric data with the value of the choice parameter 0.05234, α = 0.7125, and =6.7111, after the iteration of the mapping (7) process is carried out on g^9.

With algorithms and implementation of similar algorithms, for mapping (7) with a choice of key values in the form of the choice parameter value = 0.05234, = 0.7125, = 6.7111 as given in figure 3.

4. Conclusion

From the results obtained and discussed in the previous section, it can be concluded that the 3-dimensional mapping reduced to 2-dimensional mapping derived from the ΔΔ-mKdV equation can be used to design a text cryptography relatively easily. As the purpose of cryptography is data security, then the choice of a reversible mapping option can be used as an alternative choice of digital text encoding with a symmetric key selected non-zero parameter values. The results of this study, because the statement involved is a mapping that is reversing symmetry, then for the mapping and procedure of cryptographic algorithms used for an image, the request requires a measure preserving nature, and this will be an interesting advanced topic to study.

Acknowledgments
The authors would like to thank The Directorate of Research and Community Services at Kemenristek Dikti RI for funded this research through DIPA FMIPA Research Grants 2017 of Lampung University and also thanks to the Head of Institute of Research and Community Services of Lampung University whom supported this research.

IOP Conf. Series: Journal of Physics: Conf. Series 1338 (2019) 012041 doi:10.1088/1742-6596/1338/1/012041

References

[1] Sadikin R 2012 *Kriptografi untuk Keamanan Jaringan* (Yogyakarta: Andi Publisher) p 392

[2] El Gamal T 1985 A Public key crypto system and a signature scheme based on discrete logarithms *IEEE Transactions On Information Theory* **31** 4 pp 469-472

[3] Rinaldi M 2012 A selective encryption algorithm for digital images in the frequency domain based on chaos mutations *Electrical Engineering Journal* **10** 2 pp 66-72

[4] Arinten D H and Irawan A 2017 Digital image cryptography system on an intranet network using the method of combining chaos maps and selective techniques *Ultimatics* **9** 1 pp59-66

[5] Ronsen P, Arwin H and Indra S 2014 Encryption of digital images using Arnolds map paint and nonlinear chaotic algorithm *Mikroskil SIFO Journal* **15** 2 pp 61-71

[6] Al-Anshori F and Ariwibowo E 2014 Implementation of elGamal's public key cryptographic algorithm for encryption and decryption processes for securing data files *Journal of Undergraduate Engineering* **2** 2 pp 1-10

[7] Zakaria L, Notiragayu, A Nuryaman dan S Suharsono 2018 The integral normal form of a three dimensional traveling wave solution mapping derived from generalized ΔΔ-mKdV equation *Advances in Differential Equations and Control Processes* **19** 1 pp 37-4

[8] Zakaria L and Tuwankotta J M 2016 Dynamics and bifurcations in a two-dimensional maps derived from a generalized ΔΔ-sine Gordon equation *Far East Journal of Dynamical Systems* **28** 3 pp 165-194

[9] Shifrin L 2008 *Mathematica® Programming: an Advanced Introduction, Part I: the core language* (California: Wolfram Media Inc) pp 408