The Anatomy of ZIME

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What is ZIME?
ZIME is a standardized graphical representation of data sets.

ZIME is built of two graphical elements: (1) Sieve element and (2) Code element.
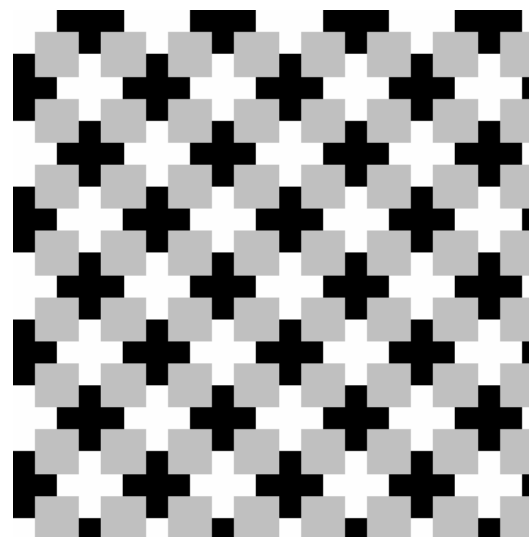
 Sieve element

 Code element

Sieve elements have always the same configuration, while Code elements are configured according to the input data.

Code elements are placed in specially designed Code element slots.

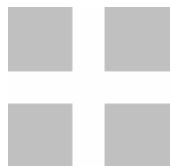There are 4x64 code element slots in ZIME (i.e. ZIME Format Specification 1 and 2)

Code element slots marked in gray.

How are the Code elements organized?
Code elements are organized in 4-element Matrices like this:

A Code element matrix.

Why 4 elements?
Each Code element is used as a graphical binary place which can be set (1, primary color) or not set (0, secondary color). Four Code elements allow us to represent binary numbers that are up to four digits long: 0..1111. In the decimal system these numbers are: 0..16. In the hexadecimal system: 0..F, which is most important for us because that means, that we can code one digit hex numbers in each 4-element Matrix.
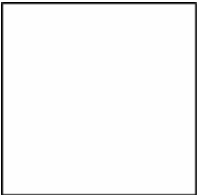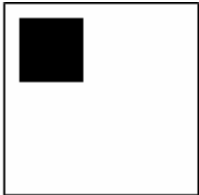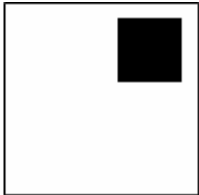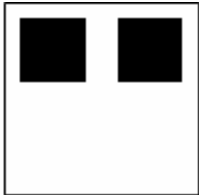
Code element colors
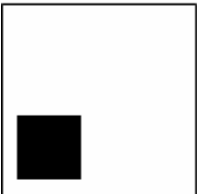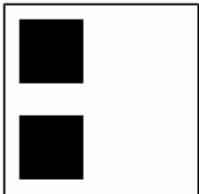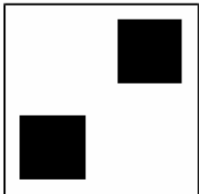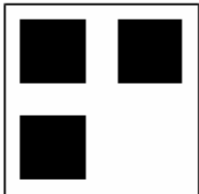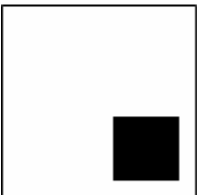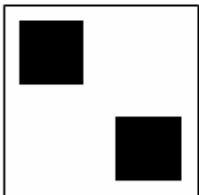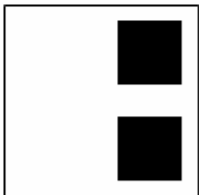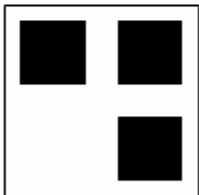
If the Code element is set, it is drawn using the the Sieve element color (ZIME standard = red), otherwise it is drawn using the background color (ZIME standard = white).

How the hex digit is encoded?

The following table shows the way in which hex digits (0..F) are encoded into the graphical binary 4-element Code Matrix.

What is Message Digest?
Message Digest is a number representing a set of Data. It is also often called Checksum or Fingerprint.
Message Digest is generated from the input Data using the Message Digest algorithm. This type of algorithm is called irreversible or one-way-hash because with ist help information it is very easy to encode but very difficult to decode. The examples of Message digest algorithms are: md5, sha or dwd. The latest is currently being used with ZIME.

How does Message Digest look like?
Message Digest is a long number. That is why it is normally written in hexadecimal form (it is shorter than the decimal form). Message Digest used with ZIME is 16 hex digits long. In a decimal representation it would be a number between 0 and 18446744073709551615. In a hexadecimal:
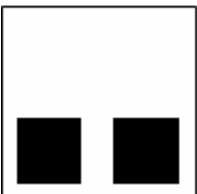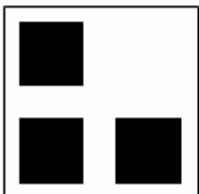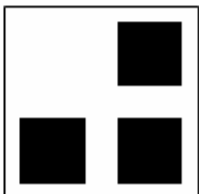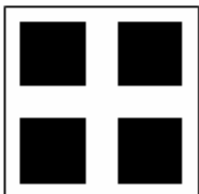0..FFFFFFFFFFFFFFFF.

Principio caelum et terras camposque liquentes
Lucentemque globum Lunae Titaniaque astra
Spiritus intus alit, totamque infusa per artus
Mens agitat molem, et totus se corpore miscet.
Hinc hominum pecudumque genus vitaeque volantum
Et quae marmoreo fert monstra sub aequore pontus.

Message digest algorithm
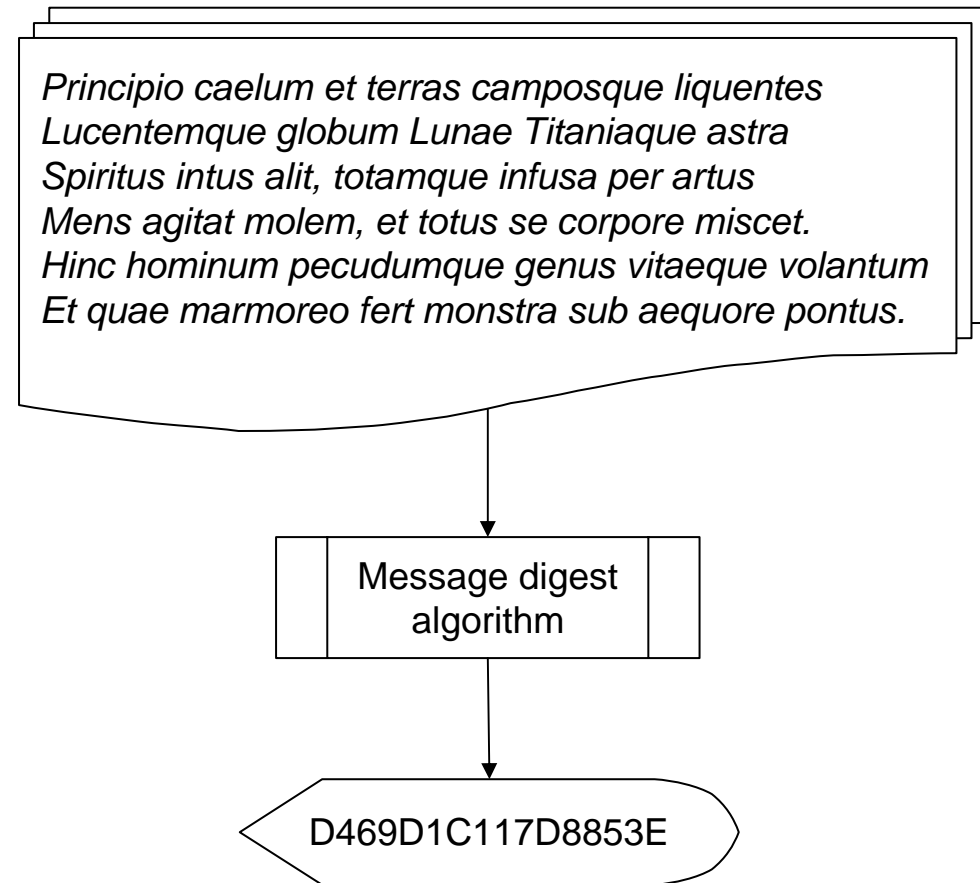
D469D1C117D8853E

Obtaining a Message Digest from the Data.

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How the Message Digest is encoded?

In the previous example, we generated the following Message Digest: D469D1C117D8853E.

Now we can encode every hex digit of the Message Digest in the 4-element Code Matrix according to the previously described graphical code table.

D	4	6	9
D	1	C	1
1	7	D	8
8	5	3	E
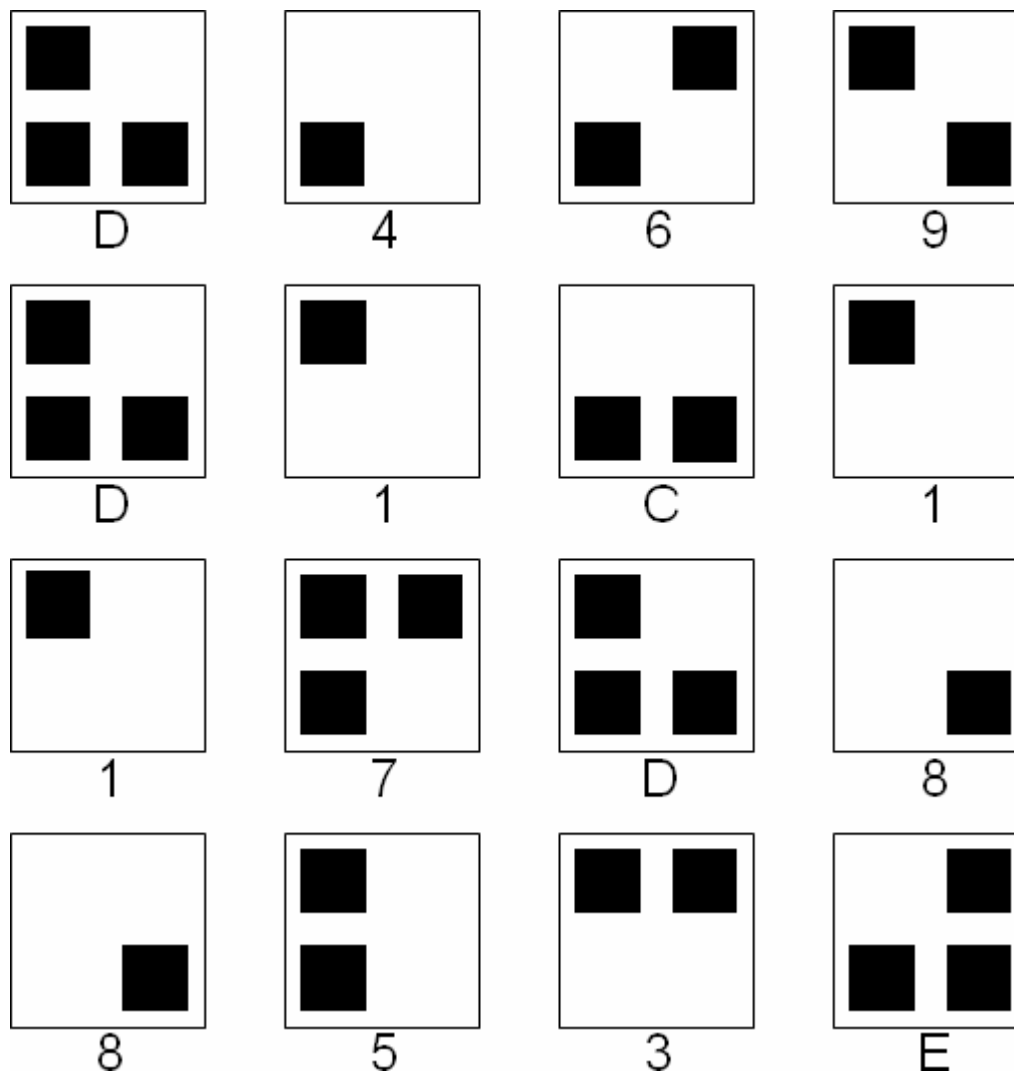
How the Code Matrices are put together in ZIME?

The 4-element Code Matrices are put together in four rows and four columns in the following order: from left to right, from top to bottom.

1	2	3	4
5	6	7	8
9	10	11	12
13	14	15	16

Configuration of the Code Matrices.
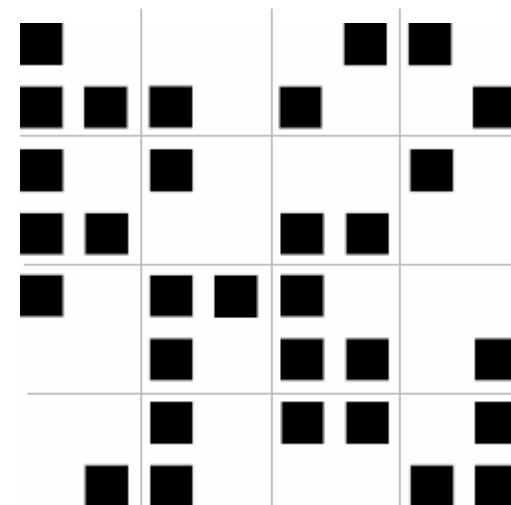
Example of the graphically encoded Message Digest D469D1C117D8853E

What is Sieve?

From the traditional ethnographical belts like Nicas Josta (latvian for Nica-belt) we learn that the graphical Code is always accompanied by the graphical Sieve.
Sieve elements have always the same special configuration as shown in the following table.
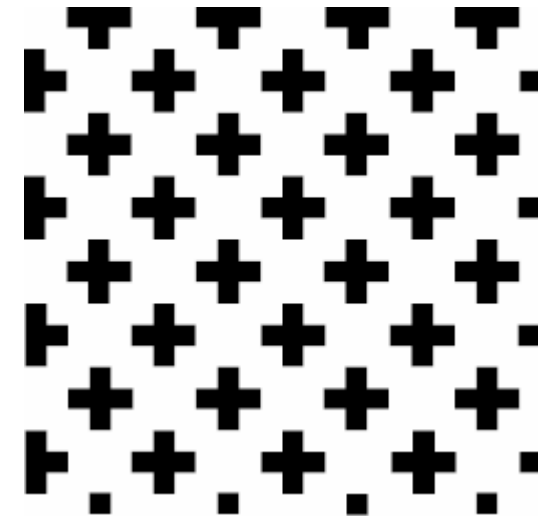
Configuration of the Sieve elements

Sieve and Code is put together

The combination of static Sieve
elements and dinamic Code
elements produce the
recognizable ZIME pattern as the
following picture shows.

Example of the graphically
encoded Message Digest
D469D1C117D8853E with Sieve
added.

ZIME Quadrants

Actually we have created so far only a ¼ part of ZIME i.e. the upper left Quadrant.
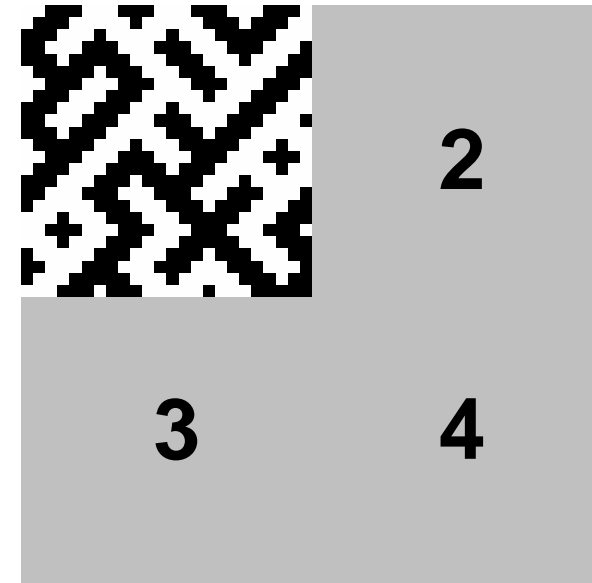
Other 3 Quadrants contain no new information encoded, but are added only for aesthetical and traditional purpose.
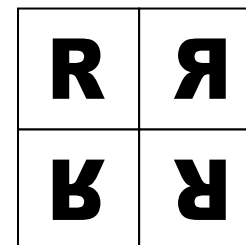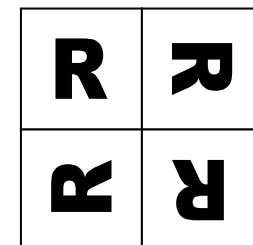

Four ZIME Quadrants

Ethnographical aesthetics

Two types of ethnographically based symmetries makes out two currently implemented ZIME Formats:
(1) ZIME Format 1 is based on Axial Symmetry,
(2) ZIME Format 2 is based on Point Symmetry.

Axial Symmetry,
ZIME Format 1

Point Symmetry,
ZIME Format 2

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Example of ZIME Format 1
We have now generated a Format 1 ZIME from the excerpt of Giordano Bruno's „De Magia":

Principio caelum et terras camposque liquentes
Lucentemque globum Lunae Titaniaque astra
Spiritus intus alit, totamque infusa per artus
Mens agitat molem, et totus se corpore miscet.
Hinc hominum pecudumque genus vitaeque volantum
Et quae marmoreo fert monstra sub aequore pontus.
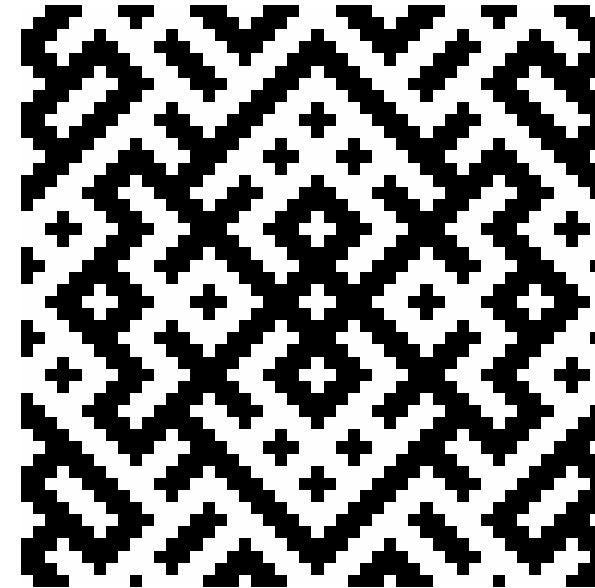
Format 1 ZIME representing an excerpt of Giordano Bruno's „De Magia".

Example of ZIME Format 2
We have now generated a Format 2 ZIME from the excerpt of Giordano Bruno's „De Magia":

Principio caelum et terras camposque liquentes
Lucentemque globum Lunae Titaniaque astra
Spiritus intus alit, totamque infusa per artus
Mens agitat molem, et totus se corpore miscet.
Hinc hominum pecudumque genus vitaeque volantum
Et quae marmoreo fert monstra sub aequore pontus.

Format 2 ZIME representing an excerpt of Giordano Bruno's „De Magia".

All changes become visible

The following example shows that the whole ZIME would change its appearance dramatically if the input data was changed even only very slightly (in this case the last dot is missing).

Original

Fake

Principio caelum et terras camposque liquentes
Lucentemque globum Lunae Titaniaque astra
Spiritus intus alit, totamque infusa per artus
Mens agitat molem, et totus se corpore miscet.
Hinc hominum pecudumque genus vitaeque volantum
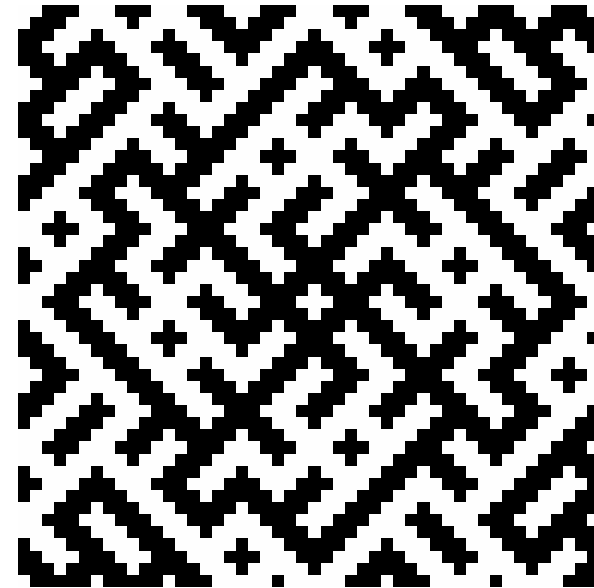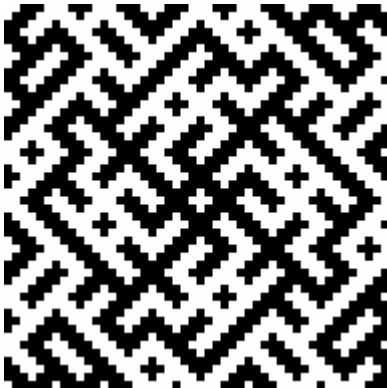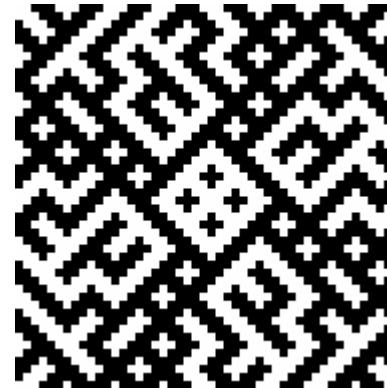*Et quae marmoreo fert monstra sub aequore pontus.*

Principio caelum et terras camposque liquentes
Lucentemque globum Lunae Titaniaque astra
Spiritus intus alit, totamque infusa per artus
Mens agitat molem, et totus se corpore miscet.
Hinc hominum pecudumque genus vitaeque volantum
Et quae marmoreo fert monstra sub aequore pontus

Document ZIME
ZIME technology can be used to visualize electronic signatures and to mark electronically signed documents.

Product ZIME
ZIME technology can be used to mark products and guaranty their continuous quality.

Personal/Corporate ZIME
ZIME technology can be used to create safe graphicals seals for persons and corporations to be used in daily correspondence and in order to give them the possibility to create derivative hierarchically personalized multiple purpose ZIMEs.
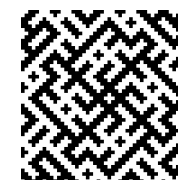
[DocumentID]

Principio caelum et terras camposque liquentes
Lucentemque globum Lunae Titaniaque astra
Spiritus intus alit, totamque infusa per artus
Mens agitat molem, et totus se corpore miscet.
Hinc hominum pecudumque genus vitaeque volantum
Et quae marmoreo fert monstra sub aequore pontus.

ZIME definition
ZIME is a standardized graphical representation of
arbitrary data sets.

What can be represented?
Any data that can be stored electronically, can be also
represented by ZIME including electronically stored files
or groups of files.

In how many ways ZIME can represent information?
ZIME represents information in 16^16 ways. That is
18.446.744.073.709.551.616 ZIMEs are possible.

**Is it possible to generate two exactly similar ZIMEs
for the different data sets?**
No, the chace is practically zero.

What are the main applications of ZIME?
-Graphical seal of electronic documents;
-Individual safe multi-purpose seal;
-Information container in the future;