

# Humanism – Complexity - Structure

An exploration of complexity

This is mainly used in the Observe Process in understanding human issues.

Humanism Processes Supported:

1. Observe
2. Communicate, 2.3 Design
3. Manage Issues, 3.2 Classify
6. Supporting Process, 6.2 Agreement Resolution, 6.3 Research & Development

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# Frame

Hypothesis: Even the most simple structured way to organize information is complex

## Questions

1. Humans Observe lots of information all the time – How are we to make sense of it?
2. How is information organized
3. Why are humans so desperate for bounds and certainty? Is it fear of death?

Population: Individual Humans, Nations

Measure: Supporting model for - Observe, Manage Issues, Agree

Assumption: Information requires structure to be useful

Information Sources and Topics: 04 Humanism - Information Classification Frame from <https://humanistman.com/home/frames/humanism-frames/> , Statistics, WWW - including those links provided.

Motivations: Build a series of cohesive Frames to model human issues.

Initial Conditions, Self reference: The ability to organize, group, abstract and manipulate information

# Context and Perspective Narrative

I have been reading many books on subjects related to humanism. I have been examining them quickly for ideas and concepts. I have now started to explore the collected texts for more information using programming tools like Python.

I have explored search and data analysis tools for many years and worked on many large government projects cleaning and migrating data between systems so I am familiar with developments in tools and technology over the last 40 years.

concept, idea, alphabet, words, vocabulary, dictionary, phrase, figure of speech, terms, expressions, quotes, sayings, messages, sentence, parsing, tagging, acronyms, spelling, lemmas, disambiguation, ontology, lexicon, coding standards, meaning, semantics, linguistics, treebank POS parts of speech  
[https://www.ling.upenn.edu/courses/Fall\\_2003/ling001/penn\\_treebank\\_pos.html](https://www.ling.upenn.edu/courses/Fall_2003/ling001/penn_treebank_pos.html), text mining, text analytics, corpus, author, book, classification, subject, topic, index, concordance, library, meta, theme analysis, topic extraction, sentiment analysis, natural language processing, artificial intelligence, style, knowledge, wisdom.

Text mining tools are improving and many more people are now involved in text and data mining.

There is always a risk of using a tool without fully understanding what it does or how it does it. This especially applies to text mining as all the assumptions are very important and generally limited and biased towards topics and the amount of expertise of the humans doing the work.

There is no “magic” solution – you have to know what you are doing.

I have written some programs to examine text utf-8 files available on the internet and have begun the idea of structuring information for many humanism related books to identify abstract concepts and themes. I need to structure my information so I can write the Python programs more efficiently.

I need to pull together some basic information frame to define and manage complexity.

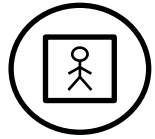
*Treetagger* <https://www.cis.uni-muenchen.de/~schmid/tools/TreeTagger/>

*National Centre for Text Mining (NaCTeM)* is the first publicly-funded text mining centre in the world. We provide text mining services in response to the requirements of the UK academic community. NaCTeM is operated by the University of Manchester. <http://www.nactem.ac.uk/>

*Stanford: The Stanford Parser: A statistical parser* <https://nlp.stanford.edu/software/lex-parser.shtml>

*Treebank* <https://en.wikipedia.org/wiki/Treebank>

*Universal Conceptual Cognitive Annotation (UCCA)* is a novel semantic approach to grammatical representation. It was developed in the Computational Linguistics Lab of the Hebrew University by Omri Abend and Ari Rappoport. <https://universalconceptualcognitiveannotation.github.io/>

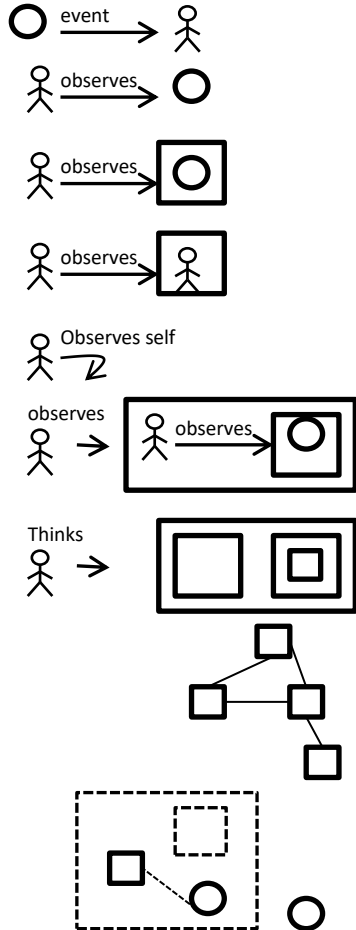


# Human Development

Humans develop over time as individuals and as groups.

I examine that development using the symbols I have for thing- universe (circle), human and (stick figure) and constraint or group (square box).

These follow general processes patterns of 1. Observe, 1.2 Frame, 1.1 Collect, 1.3 Structure, 1.4 Analyze, 1.5 Verify, 1.6 Link, 1.7 Hypothesize, 1.8 Test, 2. Communicate, 2.3 Design 3. Manage Issues, 3.2 Classify



What? – thing happens – SENSE, NOTICE, EVENT, ACT

Is? – Human observes some thing - OBSERVED

Exists? – human describes thing using BOUNDS – CONSTRAINT, FRAME, SAME, DIFF, NOT, NAMED

Who? – human observes human as a human, ABSTRACTION, GROUPED (classify), LINK (relationship (families, tribes)), ORDER (sort, rank), POSITION, NUMBER (zero is death), COUNT

Human? – observes self as ONE human IDENTITY, OBSERVER, VIEW, PERSPECTIVE

Pattern? – observes repeated pattern – PROCESS, RECURSION, INFINITY

Classify? – observes levels - (same as Exists?) – FRAME, COLLECT, STRUCTURE, ABSTRACT RELATIONSHIPS

Analyze? – observe LIMITS of levels notice complexity – need new Structure – STRUCTURE, CERTAINTY, HYPOTHESIS, relationship models, PATTERNS

Hypothesize, Verify, Test – curiosity, exploration – MINIMUM, MAXIMUM, SUM, AVERAGE, maths, statistics, models



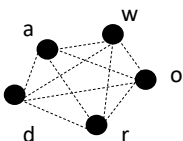
# Information Frames



Producing data and information about things in some structure is an ongoing human endeavor and is always being investigated. We seem to like to learn and share information. Is there some simple structure I can use for describing relationships between things? What do I mean when I say relationship and what can I describe?

Language has change over the years – the current language is that of graphs

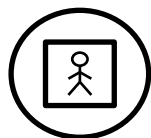
[https://www.encyclopediaofmath.org/index.php/Graph\\_theory](https://www.encyclopediaofmath.org/index.php/Graph_theory) (Leonard Euler) where Named Nodes with Value (number) (cell, points, junction, vertex, etc) can be connected by Edges (links, lines, relationship) which can optionally have Name, Direction and Value(number) to themselves or other Named Nodes. (<https://mathworld.wolfram.com/DirectedGraph.html>).



It's the general problem of N-dimensions, matrix algebra and data mining. Many techniques and computer programs try to examine this complexity. Most processes on this type of information fail to process large amounts of information and will introduce shortcuts and assumptions to reduce effort. The possible Edges for 5 Node pairs is 9 <https://en.wikipedia.org/wiki/Combination> but the combinations of all nodes is a much bigger number. I just do not want pairs of nodes but 3 node combinations, 5,6,7, etc. Word associations – with distance. The basket analysis problem. <https://www.datacamp.com/community/tutorials/market-basket-analysis-r>. The development of linear regression and multivariate analysis techniques also tries to address this issue. The general problem is specified as “**all named nodes have a number, what is the relationship and significance of the numbers?**”

Other numbers are: count of all node numbers, sum of all node numbers, count of all Edges, Node-Edge-Node directions, count and sums. Advanced statistics then examines many graphs of similar or same structure to generate more numbers and manipulate the numbers comparing each graph to other graphs and the generated numbers.

I am also trying to establish “significance” from infinite complexity ( $2$  to the power  $N$ )-1. How can I find some thing worth noticing? What does it mean if words appear together in a book? What sense can I make of it? If the word “human” appears a lot in a book – its frequency count – what other information should I relate that to? – is count of all words in the book relatable? What about words close to each other? How far apart can words be by position to still be relatable? What is the structure and definition of information required to store this information? Many people have looked at this and developed many systems named after them.



# Data

Summarizing books is not easy. Too short misses the point – too long de-emphasizes things worth noting. Like everything it needs the “right” focus (see my Focus Model – SCUTA – Scope, Coverage, Usability, Time, Abstraction). Automatic abstracts and book summaries is one idea.

*Alessio Leoncini, Fabio Sangiacomo, Paolo Gastaldo and Rodolfo Zunino (November 21st 2012). A Semantic-Based Framework for Summarization and Page Segmentation in Web Mining, Theory and Applications for Advanced Text Mining, Shigeaki Sakurai, IntechOpen, DOI: 10.5772/51178. Available from: <https://www.intechopen.com/books/theory-and-applications-for-advanced-text-mining/a-semantic-based-framework-for-summarization-and-page-segmentation-in-web-mining>*

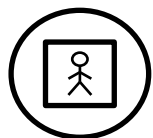
Abstraction is the main problem – Knowing when to keep all the detail or abstract to higher level “*Thus Spake Zarathustra*”. What is noticeable in books? Computer programs cannot detect humour, irony, context etc – that is why humans enjoy reading books – to learn and discover new things – to be entertained. What I get from reading a book will be different to others. My understanding of what a book means will vary over time and with context.

Maybe at best I can produce some raw data about books which is just some facts for context?

“*Thus Spake Zarathustra*” 91430 words, 45336 words after removing stopwords and recoding, 3766 unique words with count > 1. Selected word counts: love,269, good,247, virtue,126, bad,76, wickedness,19, noble,19, conscience,19.

Dublin Core <https://dublincore.org/> , W3C <https://www.w3.org/standards/faq> or [Dewey Decimal](#) may be good places to look as well.

Maybe? - Author, Title, Year Written, Year Published, Publisher Name, Subject, Source Language, Language, Translator Name, Version, *Book Type, Features, Style, Genre, Formality Measure, implied context (history, time, events, people, country, written in reaction to.., written about specific book or topic)*



# Data Frame Concepts

How to describe a graph so I can manipulate it in PYTHON? – I will use general words NOT python code first.

Similar to SET theory – same basic concepts. [https://en.wikipedia.org/wiki/Cantor%27s\\_first\\_set\\_theory\\_article](https://en.wikipedia.org/wiki/Cantor%27s_first_set_theory_article)

```
Named_collection("First");Named_Collection(node_name,node_value) = ("A",9),("B",4),("B",3), ("4",4)
```

```
First_Implied_Numbers - (node_name,node_order) = ("A",1),("B",2),("C",3), ("4",4)
```

We need order (sequence) to look at POSITION and DISTANCE

Now manipulate the collection using the implied numbers as well

```
Node_pair_name(node_name(1),node_name(2)) _ sum = 9+4
```

```
Node_pair_name(node_name(1),node_name(2)) _ distance_Forwards = 2-1
```

```
Node_pair_name(node_name(1),node_name(2)) _ distance_Backwards = 1-2
```

Also but **redundant** (we do not need the information – it conveys nothing new) comes..

```
Node_pair_name(node_name(2),node_name(1)) _ sum = 4+9
```

```
Node_pair_name(node_name(2),node_name(1)) _ distance_Forwards = 1-2
```

```
Node_pair_name(node_name(2),node_name(1)) _ distance_Backwards = 2-1
```

===== So the Loop Statement is based on ORDER\_NUMBER in the list = the order must stay the same

===== COMPARING OBJECTS IN A COLLECTION

```
For n1 = 1 to count(node_name): for n2 = n1 to count(node_name)
```

```
    n_pair_name = (node_name(n1),node_name(n2))
```

```
    n_pair_count = (n_pair_name, count(node_value(1), node_value(2)))
```

```
    n_pair_sum = (n_pair_name, (node_value(1) + node_value(2)))
```

```
    n_pair_avg = (n_pair_name, (n_pair_sum / n_pair_count))
```

```
    n_pair_distf = (n_pair_name, int(node_order(2)-node_value(1)))
```

```
next:next
```

In Summary reading one collection of data gives us a fixed set of possible information:

BASIC NAME = Collection\_name, node\_name, node\_order, node\_value,

Possible BASIC STATS = BASIC NAME + (add,subtract,multiply,divide) on node\_value

**node\_value is a collection of many numbers – we add meaning by linking nodes and manipulating number combinations.**

**Even though position node\_order is an integer it has no meaning or relationship to node\_value.**

COMBINATION 1 STATS=(BASIC NAME+Possible BASIC STATS (1,2 to 3-4 (6 rows))) information + (add,subtract,multiply,divide) for each number combination

From 1 named collection of information – of 4 named and sequenced numbers – we have created a new collection 6 rows of new information based on calculations with (add,subtract,multiply,divide) comparing 2 values(numbers) . What does it all mean?



# Information Analysis Context

This is about complexity. There is so much information available from values (numbers by constraint) that whole books, courses, language and languages have developed around it. This section tries to answer the conceptual problem of processing information sequentially from very large networks using only simple processes. READ INFO1, READ INFO2, repeat[COMPARE, ANSWER QUESTION, WRITE ANSWER, READNEXT1 AND/OR/ELSE READNEXT2]. Memory, Concept, Abstraction, Frame, Collection, Observation, Fact, Data, Information, Meaning.

**Manipulate Memory** – a general awareness of memory – being able to recall and learn how to READ, CREATE and STORE memories. Start to detect patterns and similarities.

**Conceptualization** – The ability to notice, sense, feel, think, imagine **a thing** leads to IDENTITY then NAME. Once one Concept exists then the process is repeated. We notice things. We develop processes as we notice things the same way. It is the FIRST\_QUESTION which leads to WHAT? What leads to the Answer NAME. Arbitrary **CONSTRAINT** and **BOUND**. The First ACTION is **NOTICE** the next developed ACTION is **CHOICE**.

**Abstraction** – The ability to PROCESS concepts using conceptualization PATTERN. This is where learning about how to do more **repeated** processes (PATTERNS) like SAME and DIFFERENT to test if concepts are EQUAL. If NOT = INSTANTIATED\_IN\_MEMORY (READ FROM MEMORY) concept\_name then ADD new\_concept\_name. SIMILAR (LIKE) emerges conceptually during processing and may help **PATTERN repetition**. IS (EXISTS) concepts develops and becomes READ\_FROM\_MEMORY. MEMORY is the first instance of GROUP.

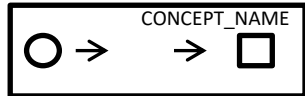
Abstraction produces ONE UNIQUE concept\_name to store in memory. We develop INFINITY from repeated processes, NOTHING when things NAMED THING NO LONGER EXIST (death), **UNKNOWN?** (possible answer to all questions) from the FIRST QUESTION ADD process emerges from the EQUALITY and INSTANTIATION\_IN\_MEMORY processes. COUNT emerges conceptually as an answer to the question “What? PATTERN To do” when EXISTING concepts are found, also develops concepts of CHANGE and DELETE pattern processes HYPOTHESIS (?) develops as we NAME things which can be DESCRIBED but not observed. INFINITY and ZERO are required for NUMBERS and **REPETITION**.

**Framing** – ability to LINK and PROCESS concepts. This where ORDER and LINK emerge. Many processes develop from the EQUAL process. Results in STRUCTURE like GROUP (which is the name for General constraint name), NETWORKS (1 to infinity LINKs), FRAMES (concepts with links) (can be NETWORK\_NAMES or often LINKED\_LIST\_NAME) – NAME recursion HIEARCHIES (vertical FRAME\_LEVEL 1 to infinity with LINK). (from recursion)

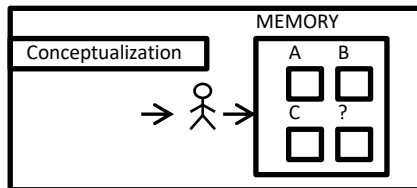
COUNT is a process PATTERN which answers the question how many links are there between the concepts on the network? ORDER develops as a PATTERN to describe COUNT FIRST\_ORDER (start process at, head), NEXT (recursive - use Integer numbers to move forward in list integer\_number positions), SUM = LAST\_ORDER, FRAME(concept)\_NAME and COLLECTION(concept)\_NAMEs and IDENTITY (EXISTS,?) (Other language - Graph, linked lists, and others use HEAD, ARC, PATH...)

INTEGER\_DIGITS develops initially as a single frame with concepts AND contents named 1,2,3,4,5,6,7,8,9. THIS IS ORDER AND POSITION. SYMBOLS are developed to be in the CONTENTS of the constraint. Constrained NAMED 1 has CONTENTS 1 This is the start of INITIAL SELF REFERENCE and RECURSION (ITERATION) and the LEVEL of iteration is defined by the same process.

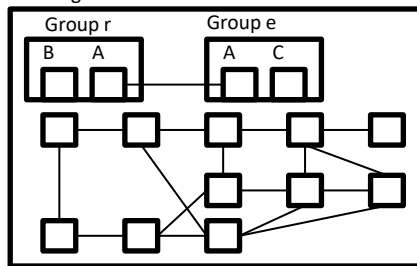
Conceptualization



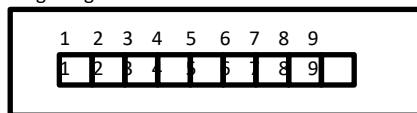
Abstraction



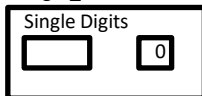
Framing



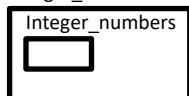
Single Digits



Integer\_numbers



Integer\_numbers

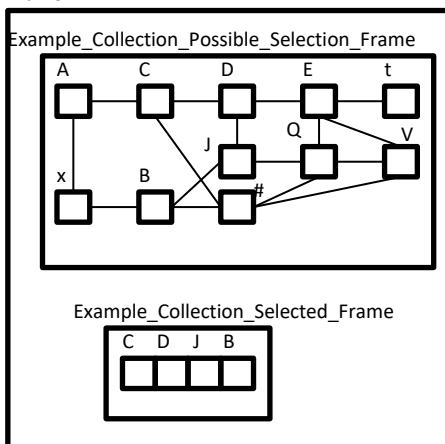






# Information Analysis Context

Frame



Concept, Abstraction, Frame, Collection, Observation, Fact, Data, Information, Meaning.

**Framing continued** – framing leads to many named Frames like Family, Integer\_Numbers, SYMBOLS, WORDS, etc which again can be grouped into other frames recursively to form schemas and other concepts. Conceptualization, Abstraction and Framing process happen in combinations. Combination information processing, PROCESSING LOGIC, etc – all based on simple COMPARISON LOGIC in answer to questions which are explained by the linked frames.

For example The\_Infinite\_list\_of\_positive\_integers is made up of several recursive\_processes that we can do in our heads very quickly all the time. We can compare two concepts in a ORDERED\_LIST and note the position IN RELATION TO (LINK) each other compared to the The\_Infinite\_list\_of\_positive\_integers frame – it is almost automatic. We can see also see the DISTANCE between them using another INSTANTIATION of the The\_Infinite\_list\_of\_positive\_integers frame, We also can COUNT them if they are EQUAL using the same list. We also get DIRECTION FORWARDS (from ADD, + from MOVE\_NUMBER\_FORWARD\_The\_Infinite\_list\_of\_positive\_integers frame) and BACKWARDS (MINUS, - from MOVE\_NUMBER\_FORWARD\_The\_Infinite\_list\_of\_positive\_integers frame

**Collection** – Collections are structured by frames and contain Observations. Collections is just another word for Frame except this term is used generally for just ORDERED\_LISTS with INTEGER\_NUMBERS. This is where MATHS comes in. the lists are organized by FRAMES – each concept in the list must be in an existing FRAME and the MEANING (CONTEXT, PERSPECTIVE) comes from examining the FACTS from all LINKED FRAMES. Collections are created by a COLLECTION\_PROCESS using FRAMES.

**Observation** – The NAME VALUE PAIRS in frame.collection.

**Fact** – compare observations and answer questions as we USE BASIC\_LOGIC\_AND\_MATHS to compare Value(Number), Observation\_Name, Collection\_Name, Possible\_Selection\_Frame and Selected\_Frame. There are many processes used here – generally asking simple questions based on simple tests. The Fact\_Position\_Process reads two frames at the same time and the same sequence and writing the NAME VALUE PAIRS with POSITION. The Fact\_Total\_Count\_Process locates the last position and writes name value pairs with Total\_cnt. Hence we get many lists of name\_value\_pairs with values and different meaning.

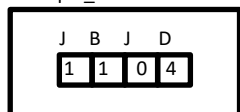
Note in the example the collection process (however the observations were collected) dot not EXIST for C hence MISSING or ?. Facts are INSTANTIATED as many ORDERED\_LISTS as a result of doing the FACTS process.

**Data** – organize observations and facts. The process is usually about optimizing – reducing the numbers of facts. For Example the POSITION of D in the Collection IS\_GREATER\_THAN B, Another Fact POSITION of B in the Collection IS\_LESS\_THAN D. These two facts the EQUAL in LOGIC. i.e. POS\_D > POS\_B is the same as POS\_B < POS\_D so it can be expressed as one FACT. MATHS\_PROCESSES try to reduce complexity.

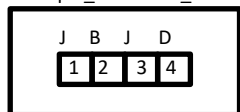
**Information** – link collections and data with additional frames – like the framing process. Reading collections helps promote new LINKS (Books for example). COMPARE concepts from information with concepts from memory. SEARCH the frames for LINKS (EQUALITY). This usually requires examining large amounts of memory in sequence and using temporary memory to store possible links. We INFORM ourselves by updating our frames with INFORMATION.

**Meaning** – changes to memory and choice options patterns based on information. KNOWLDEGE comes from choice, meaning and patterns.

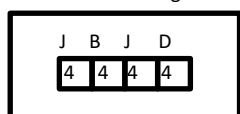
Example\_Collection



Example\_Collection\_Position



Example\_Collection\_Total\_Cnt (we must know the length of the list)





# Information Analysis Context

The general problem of processing large amounts of information has been solved by repeating simple processes and storing and retrieving information. Humans have great difficulty understanding how they do what they do.

Computers allow enormous amounts of processing of observations but our facts, data and information processes continue to develop in many different ways.

**Analysis Hierarchy** ABSTRACT.CONCEPT.FRAME.COLLECTION.OBSERVATION.FACT.DATA.INFORMATION.MEANING

We can only COMPARE two THINGS at the same time so we need to describe and share what we are comparing. We use SAME and DIFFERENT as where we draw the BOUNDS but this particular line on the continuum will be different for each human. Languages helps us share, agree and use these concepts for communication. We are trying to identify and STORE PATTERNS for CHOICE

We use LINK to RELATE two things together. POSITION comes from NUMBER ORDER. LINKS are how we NAVIGATE (SEARCH(find, locate, NOT found), COMPARE) CONCEPTS.

The number\_plane INSTANTIATES zero and infinity – they are imbedded in the definition.

**Analysis Process** – requires input information, process information (method, function, instructions, question), output information (answer, result) – this is the foundation of all computing so what are the limits? What is the foundation design?

I suspect that the Information process needs ORDER\_Num for LISTS and LEVEL\_num for Hierarchies Recursive\_iterations.

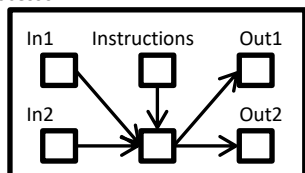
Information can be contain process instructions and observation.

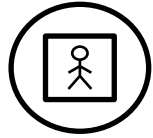
What simple processes can be designed using only 5 things in short term memory?

A processor could be described: two input lists, one instructions list, writes two output lists. The instructions list are lists of named\_processor using simple instructions of choice about reading or writing. E.g. In1=1, in2=1, instruction=same, write out1=in1, in2. Its possible that this is PATTERNED on a VIRUS, PROTEIN, DNA, RNA replication model.



Processor





# Longest Survived PATTERNS of Information

DNA STRUCTURE and Processes – all life and universe - Science, Physics, QUANTAM Mechanics, Chemistry

**NOTICE (SENSE, DETECT, FIND, DISCOVER) STEADY\_STATE** (Homeostasis, equilibrium, orbit (gravity), at rest)

**CONSTRAINT** (Bounds, cell walls, colony, cooperate - See Quantum state measurement - uncertainty [https://en.wikipedia.org/wiki/Quantum\\_state](https://en.wikipedia.org/wiki/Quantum_state) )

DO A THING (**PROCESS**) (start, initialize, begin, continue, rest, end, finish, stop, terminate)

PROCESS a PROCESS (**RECURSION**)

PROCESS In **PARALELL** (DNA, Mitochondrial DNA (from mother))(? VARY CODE AND TEST (**Hypothesis?**, Survival , useful)

) *The Origin of Mitochondria By: William F. Martin, Ph.D. (Institute for Botany, University of Dusseldorf) & Marek Mentel, Ph.D. (Dept. of Biochemistry, University of Bratislava) © 2010 Nature Education Citation: Martin, W. & Mentel, M. (2010) The Origin of Mitochondria. Nature Education 3(9):58*

<https://www.nature.com/scitable/topicpage/the-origin-of-mitochondria-14232356/>

PROCESS(**STORE**) STORED(**CODE**) (DNA, RNA, genes – all life) [https://en.wikipedia.org/wiki/Common\\_descent](https://en.wikipedia.org/wiki/Common_descent) ,

<https://en.wikipedia.org/wiki/Urmetazoan>

PROCESS(**COPY**) **USING CODE** (Replication, amino acids, proteins)

**REDUNDANCY** (Make extra copies), PROCESS(**CREATE**) (new things to do), **DELETE** (destroy things not required to save resources)

PROCESS(**JOIN**) (**LINK and STORE, chain** <https://en.wikipedia.org/wiki/Redox> [https://en.wikipedia.org/wiki/Chemical\\_reaction](https://en.wikipedia.org/wiki/Chemical_reaction) Join Types - Chemistry (sharing more than one electron) VSEPR <https://www.britannica.com/science/chemical-bonding/Molecular-shapes-and-VSEPR-theory> )

## The Meaning of Life – simplified revisited

The universe exists as a bounded CONSTRAINT recursion – imagine circles bounding circles for infinity in both directions.

The universe bounds UNCONSTRAINED event (no beginning or end)

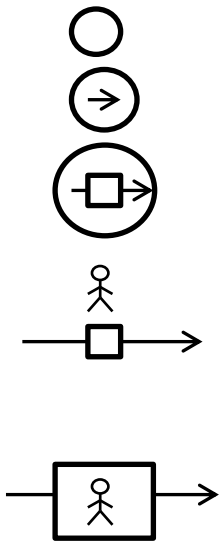
Things get created from events (as events). Uncertainty, Probability, Chaos

Things create other things (as events). Darwinism, natural selection

Humans notice events and bound them into memory as code which can store events.

i.e. as long as humans exist they can process events by :

1. Starting Process
2. Recursively calling process
3. Creating Code
4. Creating Process
5. Ending Process



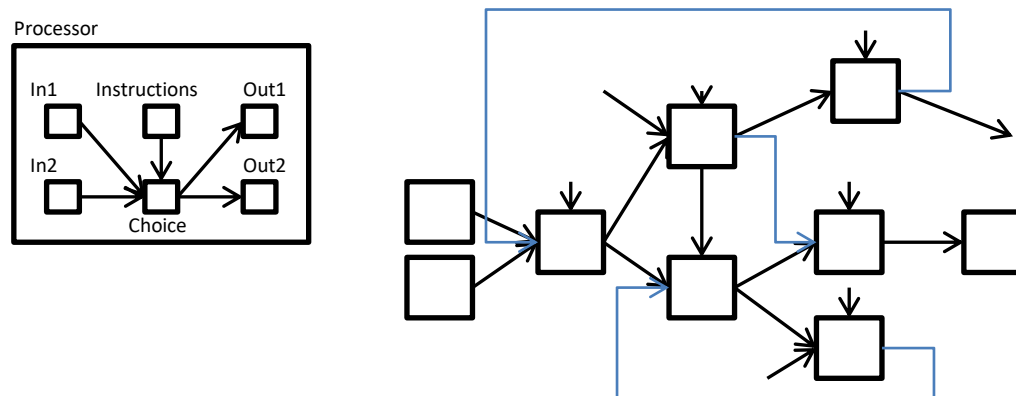


# Information Analysis Process

This description attempts to abstract general computing and information processing using a HUMAN frame to the highest general level which can be simply understood and written.

Automata assume concepts like alphabet and function which I think is like CHOICE. Can I re-discover first principles?

In this example each processor can spawn new processors each which have their own input and output channels – 3 in and 2 out. There may be other processor architectures as well with 2 in 3 out or 2 in 1 out but at minimum there needs to be instructions and input. It is pretty complicated with just 5 things in processor – what is the least complex rules for processors?



## Some Initial Rules

DESIGN: I am trying to ensure the minimum amount of different structures and the maximum amount of reuse of existing structures for SIMPLICITY. I need to design rules and logic to support the processor design.

The Processor can either be ON (running) or OFF (waiting, sleep) e.g. ALIVE. Processors EXIST in a STATE.

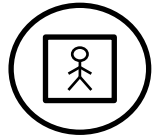
ALL objects in a Processor can have a STATE

CHOICE can have One Input CHANNEL (stream,flow) and One Instruction CHANNEL.

CHOICE can REMEMBER 5 INFORMATION CONCEPTS at the SAME TIME

Instructions INSTRUCT CHOICE to CHOOSE.

Processors can CREATE other LISTS\_OF\_instructions in PERMANENT MEMORY.



# Information choice combinations

Lets try to see in a process how I can start somewhere and build up concepts with simple instructions.

There was nothing

Then there was event.

We **Noticed** (sense, felt, bootstrapped, etc)– event started and then stopped – it was constrained. **START (beginning)** and **STOP (end)** emerged and constrained EXISTENCE (IS).

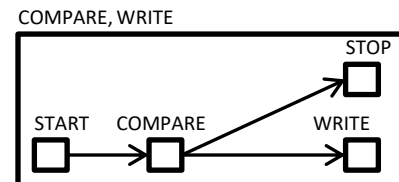
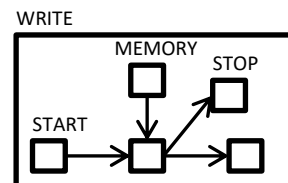
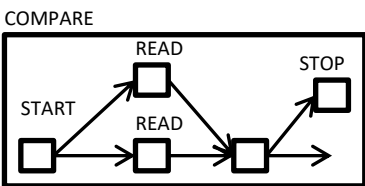
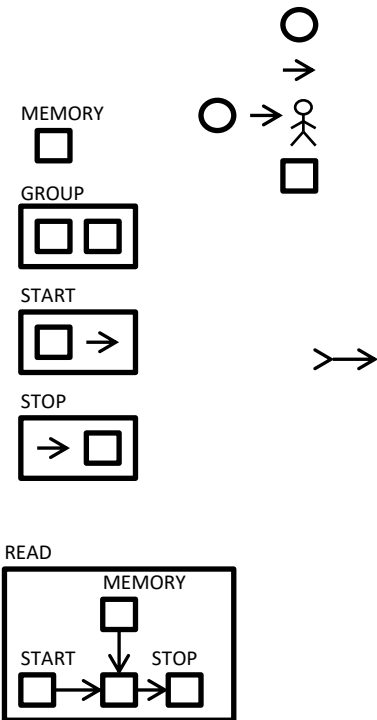
We had just invented Constraints of Memory – this was stored in sensory memory.

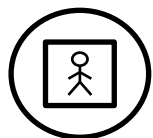
Then We **Noticed** repeated (SAME/DIFFERENT) events taking up memory this was GROUPING and PATTERN. ORDER and NUMBER emerges. Then we invented simplification to make room in memory but we had to work out how to do it – in a Darwinian sense. EXISTS was Created as a MEMORY CONSTRAINT. START (begin, on, 1) and STOP (end, finish, stop, off) become PROCESS (method, function), Conceptually we had created link between the Start of memory and the End of memory. This is very similar to computers, data processing, file processing , vector, etc.

First\_Process required to help SIMPLIFY is SAME OR DIFFERENT which is needed to free up memory.

General instructions is Read (Either NOTICE or Memory) and Read Memory, COMPARE, If Different, then write pattern1 to MEMORY. This seems to be the way of moving from unstructured sensory memory into structure so it must be based on strong capability in the brain to COMPARE things and PATTERN for Declarative memory. <https://human-memory.net/explicit-implicit-memory/>

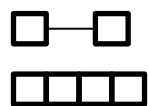
Every process needs a start and a stop and INSTRUCTIONS in ORDERED LISTS.





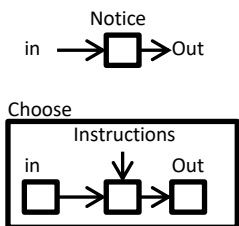
# Smallest Processor

All in Information exists in NODES. (like the brain as an example - 80 billion Neurons,) LINKED (synapses - thousands for each Neuron) to other NODES.



We simplify that to Node Link Node PAIRS (Think [complementary base pairing](#) in [DNA](#) replication) . We Then create lists of NODES in ORDER where the LINK means “All linked by same concept (NODE)” – hence we get linked lists (files, sequences, vectors, arcs, branch, path, etc) . This may be implemented physically in a number of ways but lets examine conceptually.

It’s a list of concepts which represents a PATTERN than means something to us.



What is the smallest processor for that list. It must have instructions, it must have an ability to read the list from the start in order, it must be able to use the instructions and it must have a choice of action (usually WRITE something for each list concept). Note I have skipped the Notice process which is the point where the “[a priori](#)” argument begins. Notice exists within the physical construction of the life form and the accumulation of events. David Hume’s [ought](#) begins here as the Choose Instruction.

What are the smallest combinations of general instructions?

1. START, STOP
2. IN, CHOOSE, OUT

What are the processor instructions PATTERN?

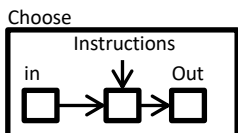
START,READ(IN\_LIST), READ(INSTRUCTIONS), CHOOSE(COMPARE), WRITE(OUT\_LIST),STOP

What are the possible combinations and what do they all mean? I can remove all the combinations which include START and STOP because they exist to handle recursion. The only Combination which remains is CHOICE, STOP. (similar to DNA stop code concept *Koonin EV, Novozhilov AS. Origin and evolution of the genetic code: the universal enigma. IUBMB Life. 2009 Feb;61(2):99-111. doi: 10.1002/iub.146. PMID: 19117371; PMCID: PMC3293468. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3293468/> )*

But what about all the other combinations?



# Smallest CHOICE Processor – the beginning of ACT and making ORDER out of CHAOS



See *Human gene Sequencing. April 27, 2019 Blog The Computer Science behind DNA Sequencing* by Alex Cabral figures by Sean Wilson

<http://sitn.hms.harvard.edu/flash/2019/the-computer-science-behind-dna-sequencing/>

*The Decision Problem* [https://en.wikipedia.org/wiki/Computational\\_complexity\\_theory](https://en.wikipedia.org/wiki/Computational_complexity_theory)

*CPU Cache* <https://www.extremetech.com/extreme/188776-how-l1-and-l2-cpu-caches-work-and-why-theyre-an-essential-part-of-modern-chips>

*RISC* [https://en.wikipedia.org/wiki/Reduced\\_instruction\\_set\\_computer](https://en.wikipedia.org/wiki/Reduced_instruction_set_computer) , <https://en.wikipedia.org/wiki/RISC-V> ,

*Strahler Number* [https://en.wikipedia.org/wiki/Strahler\\_number](https://en.wikipedia.org/wiki/Strahler_number)

*Sethi-Ullman Algorithm* [https://en.wikipedia.org/wiki/Sethi%E2%80%93Ullman\\_algorithm](https://en.wikipedia.org/wiki/Sethi%E2%80%93Ullman_algorithm)

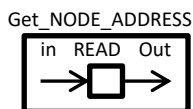
1. Example for the simple Nothing Process it would be START,STOP
2. For Read in and Stop it would be START,IN (moves in to Register1) STOP
3. For COPY FROM IN TO OUT it would be START,IN(moves to Register1),OUT (which could move to Register 2 or have a NODE location received from the instructions in which case see below), STOP
4. For COPY FROM IN TO OUT NODE it would be START,IN(moves to Register1),INSTRUCTIONS(NODE for OUT), OUT (Move to NODE for OUT), STOP

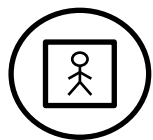
So the question becomes about combinations of instruction and inputs and outputs. How much can be held in any one processor at a time. Clearly the complexity of processing has not been solved – only improved – and artificial intelligence is not humanism.

Inside the example processes above I need internal storage for a locator for IN\_NODE and OUT\_NODE as well as INSTRUCTIONS. I need storage for the values from those nodes (4 Storage Locations). I need LOGIC to compare and CHOICE to STOP. I would need at LEAST 4 FRAMES or PROCESSORS to identify at least 4 values at the same time. I could simplify and use the sort process as a well documented CHOICE model (not at the moment) [https://en.wikipedia.org/wiki/Sorting\\_algorithm](https://en.wikipedia.org/wiki/Sorting_algorithm) ? or maybe explain integers in a process and how they represent order (sequence) and hierarchy (simultaneously)?

My hypothesis is that everything can be done with **recursive simple processes** - GENE TECHNOLOGY has explored the 3 BILLION base pairs in combination with only great technology investments and improvements of techniques.

So far the candidates for special brain structures are the get\_node\_address process because it has to span the entire memory and the special structure of neurons – all with different designs and numbers of connections





# Smallest CHOICE Processor – Calculus, DNA and Links – What is Order?

Calculus [https://www.math.wisc.edu/~keisler/chapter\\_1b.pdf](https://www.math.wisc.edu/~keisler/chapter_1b.pdf), DNA base Pairs, RNA replication and Information processing all follow the same patterns. (maths always comes up with pi  $\pi$  as ANSWERS because of an (ordered pairs possibly) sequence (distance calculation) PROCESS which we visualize as 2 dimensions usually X,Y number planes. Pythagoras <https://en.wikipedia.org/wiki/Pythagoras> "According to Aristotle, the Pythagoreans used mathematics for solely mystical reasons, devoid of practical application.[124] They believed that **all things were made of numbers**.[125][126] The number one (the monad) represented the **origin of all things**[127] and the **number two (the dyad) represented matter**.[127] The number three was an "ideal number" because it had a **beginning, middle, and end**" developed the calculation of distance on a two dimensional plane. [https://en.wikipedia.org/wiki/Euclidean\\_distance](https://en.wikipedia.org/wiki/Euclidean_distance) The Euclidean distance between points  $p$  and  $q$  is the length of the line segment connecting them. In Cartesian coordinates, if  $p = (p_1, p_2, \dots, p_n)$  and  $q = (q_1, q_2, \dots, q_n)$  are two points in Euclidean  $n$ -space, then the distance ( $d$ ) from  $p$  to  $q$ , or from  $q$  to  $p$  is given by the Pythagorean formula: Distance = square root(SUM(SQUARE( $p_1-q_1$ ),.....SQUARE( $p_n-q_n$ ))). **HENCE the optimal solution to all possible distances from any point of reference to another point of reference in any number of dimensions is like a circle and related to pi.**

At the heart of the problem is ORDER (sequence, number plane), PROCESS (function), two NODES with ONE LINK (graph theory). HUMAN DNA represents arguably the most successful way of INSTANTIATING INFORMATION in OUR universe. Think of it this way – all of the things humans have ever built, designed, produced and exist now came from 1 piece of information stored in 3 billion ORDERED PAIRS (duplicated with variation in billions of humans who can exchange and change information in an impossibly large number of ways).

Another way to put it is INFORMATION is SUSTAINED (flexible, change, develop, grow, learn, respond, adapt, vary, duplicate, redundant) in a CONSTRAINT (Humanity) that can CHANGE ITS OWN UNIVERSE. This is the QUESTION the Artificial intelligence PROCESS seeks to ANSWER (usually ending up at recursion, self-definition, initial conditions, tautology, (can a computer build a computer with knowing the rules),etc).

Assume we have a ONE DNA strand like list of pairs ( $p_1, p_2$ ) where we want to ESTIMATE HOW MUCH EFFORT (DISTANCE) is required to GET TO (DO A PROCESS – CHOOSE TO ACT) the PAIR WE WANT (FROM OUR MEMORY – we have seen it before and we will know it when we see it) from WHERE WE ARE on THE LIST (CURRENT POSITION (OUR UNIVERSE)).

EACH PAIR is in ORDER then we can take the shortest PATH and use less energy. If not - it is random and we will die before we ever find it.(DARWINIAN) SO WE CREATE A LINK between the pairs and we call it number. So Links ARE NUMBERS – related to ENERGY and TIME to PROCESS. Link between one thing another is the time and energy required for processes between them. The Link between TWO Things is 1 UNIT of THEIR SHARED UNIVERSAL FRAME (RELATIONSHIP, ATTRACTION, LINK, BOND, FORCE, GRAVITY, ASSOCIATION, ENERGY, PROCESS, "SHARED VALUES")

DNA PAIRS 'adenine (A), cytosine (C), guanine (G), or thymine (T). The two strands are held together by hydrogen bonds between the bases, with adenine forming a base pair with thymine, and cytosine forming a base pair with guanine. <https://www.genome.gov/genetics-glossary/Base-Pair> A-C and G-T are the only possible pairs but 4 COMBINATIONS of ways to ORDER them in the FIRST POSITION – NUMBER = 1,  $4*4=16$  for the SECOND position – as each POSITION increases by 1 the POSSIBLE COMBINATIONS are RECURSIVELY multiplied by 4 (POWER FUNCTION (RECURSION)) or REMEMBERING LAST NUMBER and MULTPLYING IT AGAIN for EACH walk (PROCESS) along the path (COMPUTER PROCESSOR REGISTER)





# What is Order and how do we make it?

## (Hint = We invent the number plane and use recursion)

Aristotle "Contemporaneously with these philosophers and before them, the so-called Pythagoreans, who were the first to take up mathematics, not only advanced this study, but also having been brought up in it they thought its principles were the principles of all things. Since of these principles numbers are by nature the first, and in numbers they seemed to see many resemblances to the things that exist and **come into being**-more than in fire and earth and water (such and such a **modification of numbers being justice**, another being soul and reason, another being **opportunity-and similarly almost all other things being numerically expressible**); since, again, they saw that the modifications and the **ratios** of the musical scales were expressible in numbers;-since, then, all other **things seemed in their whole nature to be modelled on numbers, and numbers seemed to be the first things in the whole of nature**, they supposed the **elements of numbers to be the elements of all things, and the whole heaven to be a musical scale and a number**. And all the properties of numbers and scales which they could show to agree with the attributes and parts and the whole arrangement of the heavens, they collected and fitted into their scheme; and if there was a gap anywhere, they readily made additions so as to **make their whole theory coherent**. E.g. as the **number 10 is thought to be perfect and to comprise the whole nature of numbers**, they say that the bodies which move through the heavens are ten, but as the visible bodies are only nine, **to meet this they invent a tenth--the 'counter-earth'**." <http://classics.mit.edu/Aristotle/metaphysics.1.i.html>

I think this is where the Greek's encounter recursion and infinity?

[https://www.math.wisc.edu/~keisler/chapter\\_1b.pdf](https://www.math.wisc.edu/~keisler/chapter_1b.pdf) We have to invent order and make up the number plane. Lets start with inventing order. ORDER comes from PATTERN, patterns comes from REPEAT SAME, repeat same comes from SEQUENCE, sequence comes from NOTICE and Notice comes from Time with UNIVERSE.

Lets think of walking (Euler walks – The Euler Archive <https://scholarlycommons.pacific.edu/euler-works/53/> ) between same things - [https://en.wikipedia.org/wiki/Seven\\_Bridges\\_of\\_K%C3%B6nigsberg](https://en.wikipedia.org/wiki/Seven_Bridges_of_K%C3%B6nigsberg) the Seven Bridges problem. (**The Universe is COMPLEX** – some things cannot be simplified) The general problem is time and energy to get from one place to another in a universe where some things are connected to more than one thing (there are more than just unique singles or pairs where every single node is unique)



Human starts in middle of bridge and goes nowhere, then moves to one end. Next goes back a long bridge to other end – notices the ends are different.

IF ONE Pair (BRIDGE,EDGE,PATH,ENERGY,TIME) then each NODE (end of bridge) is **NOTICED** as **NOT SAME** make New NODE.

Stays on same bridge doing same BRIDGE PROCESS and never leaves (STUCK, OSCILLATES, HOMEOSTATIS, LOOPING, AT REST, ZERO) ELSE:

Human does another BRIDGE process and adds more nodes doing the same BRIDGE process. BRIDGE PROCESS becomes expensive – need to optimize PATHS OF CHOICE FOR LESS ENERGY. Let us list bridges and destinations (NODE, BRIDGE) where the person has travelled one path without ending up at the same node. (NODES,BRIDGES):

(**A,A**),(**A,B**)(C,D),(D,E),(**A,B**),...) so our human found himself walking on the same bridge on the same path to the same node. HE IS STUCK IN A LOOP and will never leave.

This is just the same as (OSCILLATES, ... RECURSIVE) ELSE **SOMETHING RANDOM HAPPENS AND NEW PATH OPENS UP:**

(NODES,BRIDGES): (**A,A**),(**A,B**)(C,D),(D,E),(F,G),(H,I),(J,K),(L,M),(N,O),(P,Q),(**A,B**),...) so our human got further but did not notice because **ran out ability to REMEMBER the first PATH. So Stuck AGAIN!!**

Did the same thing so many times – accidents helped changes over billions of years and there was a way to retrieve memory – (**I was proud** that I had learned how to use my memory better) - by counting my steps along the path to help EXPLORE THE WORLD of POSSIBLE PATHS. (**The Universe is UNCERTAIN**)



# NODES, EDGES to NUMBERS

(NODES,BRIDGES): (A,A),(A,B)(C,D),(D,E),(F,G),(H,I),(J,K),(L,M),(N,O),(P,Q),(A,B),...

I have a new concept in memory called ORDER for a thing I have repeated so often its stuck in my brain. it's a shorter version of this pattern of nodes and bridges I have been crossing so it will save memory. I will call the first node, bridge 1 and the second 2 and so on. So

(NODES,BRIDGES) becomes (ORDER) (1,2,3,4,5,6,7,8,9). My recognition of the pattern of NODES and BRIDGES has become ingrained in my system.

I **Created – Invented** - Something New – That was **just as good** as improving my memory but a little different)

So that saved me from remembering so much. Let us go and cross more bridges! – It's the reason I exist – to walk those bridges.

(ORDER) (1,2,3,4,5,6,7,8,9) (stuck for a long time but then another random thing happened and a new path opened up.

(ORDER) (1,2,3,4,5,6,7,8,9, A) – what is that? I have to stop in a LOOP again! There I was ... **complacently** comfortable with my new thing now what?

Same as before chaos, death, random and then Human can KEEP BOTH THINGS IN MEMORY. Can keep NODES,BRIDGES and ORDER

BUT same as the problem with these nodes and bridges in the first place I running out of MEMORY.

How about I just remember a short list and technique together and do more than simple PATTERN and ORDER recognition.

I will use the same values as I do for order so that I can increment it like ORDER.

(LEVEL) = SAME AS (ORDER) – I have just SQUARED the amount of memory! I Invented something new (recursively).

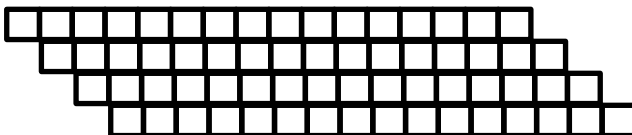
So each time I take a walk along the path once I get back to the ORDER I Just do I new Process Called LEVEL.

I DO my ORDER process for LEVEL (PATTERNING) and start the Path walk again. This works for a while then somehow something changes.

RECURSION IS INVENTED. So this fixed set of memory called ORDER can be stored indefinitely just by doing a same process of order over order and remembering our paths. (**The UNIVERSE is Ordered**)

The UNIVERSE and our Paths through it are ordered. We implement ORDER (ORIGINALY AS SEQUENCE IN PATH) as a List of repeated symbols by the rule – DO EACH order number in LEVEL **POSITION** (where Level and Order is the same) when at end of ORDER WRITE 0 and move to the next Position in LEVEL. This are implemented in IN PROCESS MEMORY registers in CPUs.

This is why numbers seem like LIST OF PAIRS – BECAUSE THEY ARE. They represent a representing counts of process (walking the bridge). LEVELS allow Hierarchy structures , adding more LEVELS produces NETWORKS. The number plane has 2 more dimensions DECIMAL((x,y)) with the same values of ORDER and the same technique as levels but it represents the numbers after the decimal point.





# Walking Down our ORDERED PAIRS – DNA

## Now we know what numbers are

A-C and G-T are the only possible pairs but 4 COMBINATIONS of ways to ORDER them in the FIRST POSITION – NUMBER = 1,  $4*4=16$  for the SECOND position – as each POSITION increases by 1 the POSSIBLE COMBINATIONS are RECURSIVELY multiplied by 4 (POWER FUNCTION (RECURSION)) or REMEMBERING LAST NUMBER and MULTPLYING IT AGAIN for EACH walk (PROCESS) along the path (COMPUTER PROCESSOR REGISTER)

Walking and remembering and counting because we know it is ordered.

Clearly 2 is important because of how we describe objects as processes linked by starts and stops in time. i.e. You cannot have a bridge to nowhere **0,1,1,2,3,5** is important and Pi. 5 is everywhere in life. According to *Srinivasa Ramanujan* - 5 is in the number plane related to the pi i.e. the DISTANCE calculation and intriguingly 239 seems next with a lovely (-4) between it (which is 5 links away?) **0, 1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89,144, 233, 377** (Fibonacci sequence)  $233+1+5 = 239$

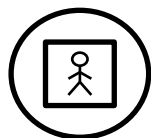
First there IS(PROCESS) a thing **G**. Then comes along somehow (IS) **T**. SAME and DIFFERENT in the same universe. Maybe another IS(PROCESS) takes place time link of some kind – a well ordered event – maybe TIME SPENT TOGETHER IN THE SAME UNIVERSE or number of shared events? Then **A** comes along all by itself and notices the SAMENESS of everything but A cannot form a LINK because of some kind of CHOICE or rule? G and T have spent so strong bonds they have **forgotten** what joined them in the first place? Then C comes along and pairs up with A UNIQUELY. So **G-T** and **A-C** exist. Then ANOTHER link event occurs that allows what linked the first G to T to happen in with PAIRS. SO the simple Gs which keep appearing in the universe get GREEDILY gobbled up by the LINKING PROCESS to any T (and also VICE versa) the same things is happen for any C or A which appears in the universe.

We could represent this by bracketing universes ((G)(T))((A)(C)) we can see levels emerge. They exist the same level but the communication LINKS only appear in SAME combinations. Another way to think of this is that in an G universe only Gs exist and get created When G & T universe bump into each other they stay together. What about another universe of R it could not join the first PAIR but found its way into the second. ((G)(T))((A)(C)(R)) How are G and T going to learn about R? Well there has to be another BRIDGE , PROCESS, LEVEL to Link them it a new universe gets created around the G-T pair so they can talk to the R universe. (((G)(T))((A)(C)(R))) So G and T talk to each other a lot but its a bit more work to talk to A and C. But for G and T to talk to R they have to go to a whole other level.

So the problem to understand the universe is universal. What is the fundamental meaning of existence? What are the rules?

Stephen Wolfram discussing the mathematics of *Srinivasa Ramanujan* <https://writings.stephenwolfram.com/2016/04/who-was-ramanujan/> Ramanujan's (Machin's series from 1706) did involve the seemingly random number 239: Machin's series for pi - But Ramanujan's series—bizarre and arbitrary as they might appear—had an important feature: they took far fewer terms to compute pi to a given accuracy.

$$\pi = 16 \left( \frac{1}{5} - \frac{1}{3 \times 5^3} + \frac{1}{5 \times 5^5} - \dots \right) - 4 \left( \frac{1}{239} - \frac{1}{3 \times 239^3} + \frac{1}{5 \times 239^5} - \dots \right)$$



## Trying to Simplify again

?



WHAT came first universe or event? Maybe they come together?

WHAT is the first QUESTION. I will keep asking that question forever.

So we get THING , ORDER, QUESTION – ANSWER(NAME). RECURSION, LOOP, REPEAT

ENTROPY? (ENERGY,MOMENTUM? Things appear like Time and space)

That was UNIVERSE. Then more UNIVERSES were made

There seemed to be path which is the result of a PROCESS and the first PROCESS was make UNIVERSE?

Well I suppose if you made one then why not many universes? And if two universes happened to JOIN – why not call that process MAKE LEVEL

PROCESS (MAKE ENTROPY recursively)

**LEVEL 1** Subatomic quarks ,etc A few millionths of a second later

**LEVEL 2** protons and neutrons. Within minutes, these protons and neutrons combined into nuclei.

**LEVEL 3** It took 380,000 years for electrons to be trapped in orbits around nuclei, forming the first atoms.

**LEVEL 4** stars formed from clouds of gas around 150–200 million years after the Big Bang.

**LEVEL 5** galaxies <https://stardate.org/astro-guide/galaxy-formation> 1 Billion years after the Big Bang

Humans are made of all things a level BELOW us (that is direction?). I think the SUSTAINABLE PATTERN (usability) of this universe is - that our limit to observations is 5. We see CHAOS in the behaviour of galaxies – which seems like SLOW MOTION to US. We would have to live infinitely long to understand the Patterns of Galaxies. Infinite chaos exists at every level but we cannot see it until it forms a pattern.

There is only ONE boundary step between each LEVEL. We are formed of ATOMS. Humanity represents one line of development on the ATOMIC level. Humans are not formed from quarks – the quark universe does its own thing. To shift universal frames takes a lot of Entropy. In what place in any universe could we learn the pattern of galaxies? Or quarks? How could we get inside the quark universe to experience its chaos.

Stars do not care that they exist in Galaxies, Protons do not care that they exist of Quarks.

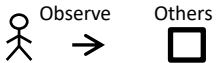
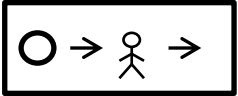
The Hubble constant, Freidman, equations, Math, multiverse, Einstein, etc – all – expose and exploration of paths in levels. – All things are changing at all levels in all universes. Things can IMPACT each other Our STAR WILL DIE. Galaxies will TAKE LONGER to RIP OUR STAR apart. ATOMS and CHEMISTRY is changing all the time but we see only the SUCESSFULL survive. Quarks are changing too at a MUCH QUICKER RATE – but only the stable survive. WE SEE history of PROGRESS (of this experiment) through LEVELS.

There were infinity number of subatomic particles – what is there now are the ones that’s survived – the quark universe is still experimenting. The rest we call “Dark”.

# Communication Foundations for Humans



Others



We do not know what goes on in other peoples minds – what abstractions they have – how they choose to act or what schemas they have. Maybe they do not have any conceptualizations or abstraction abilities at all. Maybe they have no INTELLIGENCE. So babies observe , sense, notice and remember things in sensory memory. Then they develop conceptualization and abstraction capabilities. Once that happens the brain grows very quickly.

PATTERN is something which repeats. It is one of the first things developed and noticed and comes from EVENTS (things, choice)

The First Choice is NOTICE INPUT (Perception) AND CHOOSE TO STORE IN MEMORY (breadcrumbs, stones) which is a GROUP Pattern.

SO CHOICE develops from CONCEPTUALIZATION and is a Pattern of the PROCESS of ABSTRACTION.

THIS become a process and we notice and develop lots of different process which we Name ACT, ACTION LINK to GROUP.

So NAME, PATTERN, GROUP are very closely related and the first major concepts built with SAME and DIFFERENT concepts (differentiation, level) and CHOICE.

When we communicate we are sharing common PATTERNS and noticing and exploring differences.

Learning means rearranging our patterns and changing choices.

Fairy Tales, Songs and Nursery Rhymes help child pattern, learn and remember.



# A Little Path Narrative

I cannot find a source for “Build a Bridge and Get Over it” but like many things it resonates – we recognize it. It’s a PATTERN.

So bounce backwards and forwards against our boundaries on our little bridge of entropy – oscillating and going around in our own little circles, our limited word view, round and round for ever and then someone pushes the boundaries and finds another destination or another choice simply appears. Path of Breadcrumbs so we remember. ([Modulo arithmetic](#) ([Gauss](#)) gives our position on the path example Clock (pattern, cycles, sundial, memory, order) increments hours, minute, second hands by 1 Unit)

We walk the paths dropping breadcrumbs so we remember where we have been and what direction we are going along the path. We see two breadcrumbs we remember we know which direction we are going. We go to places where there are no breadcrumbs and drop one. If we see two breadcrumbs we know we are coming back the path in the other direction. Just Like Hansel and Gretel [https://en.wikipedia.org/wiki/Hansel\\_and\\_Gretel](https://en.wikipedia.org/wiki/Hansel_and_Gretel) to help us find ways along the path – either away from the witch (certain death) or towards degrees of freedom of choice (chaos and uncertainty).

Infinite numbers represent all the steps we take – each path, each bridge, each process, etc .. but if we restrict ourselves to that path then we are going to end up at that witch’s house again because we stayed on the one known path of breadcrumbs. We must explore and make new paths all the time to avoid the witch. We get to position level 1 we have to avoid the zero level. This is learning, invention, discovery, insight, creation, etc. We must also make sure nothing DESTROYS the breadcrumbs we left otherwise we have to die all over again and start again.

Every choice creates another path and every path creates another choice. Every choice is another level. Choice and path exists on every level (entropy). Entropy replicates itself into another level, constraint, universe, etc - for infinity.

At each level entropy replicates itself also within the level – and every instance of replication then follows the same process – within bounds replication and new level replication. This is infinity. *Infinite dimensions function spaces* ([Stephan Banach](#)), *vector space*, theory of linear operations, [Ricci curvature](#), [Riemannian manifold](#), [Zorn’s Lemma](#), [Axiom of Choice](#), [Well Ordered Theorem](#), [A Mathematical Theory of Communication](#) (C. E. Shannon (Path-signal,noise,output)), **DEATH,ENTROPY** (pattern, cohesion, congregate, assemble, join, *a priori*, choice 0,1,1,2,3,5 ([Fibonacci](#), [Lucas Numbers](#)( [Sequence](#)), [Pell Equation](#), [Diophantine Equation](#), constant, recurrence, [modulo](#), repeat, symbolism, algebra, maths, order), gather, orbit, loop, noise, interference, notice, detect, act, move,level), **CHAOS**, infinity, calculus, topology, combinatorics, probability theory. **Humans have to move by choice from death to chaos. 5 is the most highest level repeated pattern we observe which sustains.**

Our frame of reference is limited by level by understanding Planck, Hubble, Heisenberg and Einstein and using the pattern idea to about 5 levels with us in the middle. We can see(observe, information) with some ENTROPY the level below and above easier than the next levels.  $E=M*(C*C)$  takes a PATTERN photon (a thing Mass) 2 levels below where we are on the frame (electron PATTERN is ENTROPY) and observes the photon two levels above us – what we call the sky – the universe, astronomy, etc. We cannot see/make sense of/understand/comprehend below the level of the photon and electron (the smallest process, entropy). SAME and DIFFERENT is [https://en.wikipedia.org/wiki/Pauli\\_exclusion\\_principle](https://en.wikipedia.org/wiki/Pauli_exclusion_principle) [Bosons](#) and Fermions.

SAME (Fermions) is stability - the things we **NOTICE** (Boundary, constraint) DIFFERENT (bosons) is freedom to explore, invent, interact, etc. We see Fermions as WAVES (entropy) PATTERNS between (link, join, bond, path, bridge) 2 BOSONS (entropy) PATTERNS. [https://en.wikipedia.org/wiki/Wave%E2%80%93particle\\_duality](https://en.wikipedia.org/wiki/Wave%E2%80%93particle_duality) (when electrons **go to** (entropy, path, choice) a **lower** orbit they emit a photon (thing, entropy)



# A Little Path Narrative Memories (breadcrumbs)

Thermodynamics, Isaac Newton The Newton Project <http://www.newtonproject.ox.ac.uk/view/texts/normalized/THEM00092>  
Certain Philosophical Questions

## *Questiones quædam Philosophiæ*

### *Off the first mater*

*Whither it be mathematicall points: or Mathematicall points & parts: or a simple entity before division indistinct: or individualls i.e. Attomes{.}*

*1 Not of Mathematicall points since what wants dimentions cannot constitute a body in their conjunction because they will sinke into the same point. An infinite number of mathematicall points sink into one being added together & that being still a mathematicall point is indivisible but a body is divisible.*

*Not of parts & Math: points; for such a point is either something or nothing. if something tis a part & so added betweene 2 parts will make a line of 3 parts. if nothing, then added betwixt two parts there is still nothing betwixt the 2 parts & consequently the line consists of nothing still but 2 parts. &*

*Not of simple entity before division indistinct. for this must be an union of the parts into which a body is divisible since those parts may againe bee united & become one body as they were before at the creation. Now the nature of union (being but a modall ens) is to depend on its parts (which are absolute entities) therefore it cannot be the terme of creation, or first matter for tis a contradiction to say the first matter depends on some other subject since that implies some former matter on which it must depende.*

*<88v> The latter will be in its due place be proved impossible*

*3 Those things which can exist being actually {seperate} are really distinct, but such are the parts of mater.*

**5 is a good number – we see it everywhere – we see 1 everywhere as exists – we see 1 split to 2 (2 arms, legs, (in, out), (front, back), (forward, backwards)) – we see hands and feet with (5 toes, 5 fingers) 5 senses (inputs), - this 5 seems to be the sustainable pattern of observation. It is our HUMAN FRAME and a UNIVERSAL PATTERN. These collections of SUSTAINABLE 5's seem to be able to explore the universe. This would seem to indicate that about 5 (degrees of separation, levels, entropy) of conceptual separation make sense or is useful in our universe – things too far away seem to fall off – disappear, die, wither, fade from memory, too hard to find or search, etc. For text mining and information processing - linking 5 levels together is a good limit.**

It is all we can notice, recognize, remember, detect, choose, inform, discover, analyse, use, make sense of, understand, know, comprehend, cohesion, affinity, like, etc.

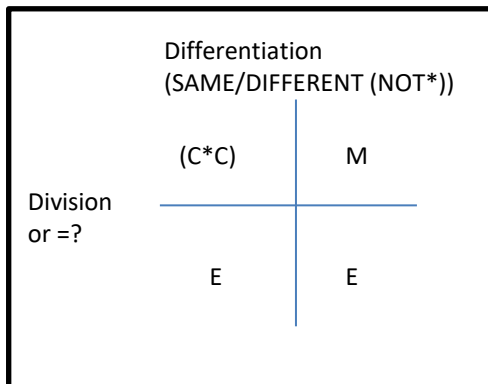


# Einstein Again

$E = M * (C * C)$  is one of the strongest and simplest patterns in all science. What we get from Einstein's insight is the concepts of Same and Different and relationships to other things. Those other things are equality (which is like same and different) and Division. [https://en.wikipedia.org/wiki/Albert\\_Einstein](https://en.wikipedia.org/wiki/Albert_Einstein) We see the different and same is measured by photon (C) but essentially it could be measured by any detection (same) unit. Let us re-write the equation to the question  $E/E = (M/E) * (C * C)/E$  - which by our simple rules of math is an equivalent expression.

Another way to think about it is that same and different have a relationship and Energy and Mass have a relationship (Entropy). So we have two main relationship concept pairs (same \* different) \* (Mass / Energy) - See how the nested problem of the multiplication loop (Power) function appears inside the concept of same and different?

We can express that as a 4 cell matrix of expressions - which is just like an hypothesis - true false, hypothesis arrangement



C is the constant for the speed of light in a vacuum using the SAME UNIT OF MEASUREMENT (observation, information) (a Photon). The (C\*C) Pattern EXISTS. It's a loop its stuck in. It makes existence so do the same thing next and make M EXIST.

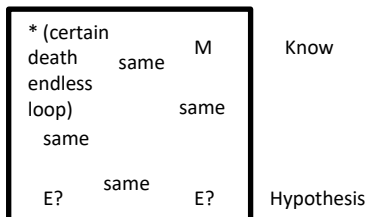
What you see is that our CERTAINTY of sameness is in the first cell of the 4 cell matrix and to tell the difference (the multiplication process) we have to invent a new term - in this case we call it MASS or Thing or Node.

The Energy concept E represents process, function, event, action, work, choice, etc - we understand it as distance, time and order and would like it to be Unique and Discrete UNITS (like EXISTENCE, ORDER, INTEGERS) for both cells. i.e.  $E=E$ .

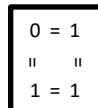
Energy is essentially chaos and the DIVISION boundary is trying to resolve the repeating process problem by using either decimal fractions or whole units. (INTEGERS) of Sameness/Difference. i.e. Modular arithmetic using the idea of defined things (mass) and leaving no remainders.

So what we call HYPOTHESIS is the Energy required to resolve the question of neat division into whole numbers of things which are same and different. We hypothesize there is another process to create Matter and Energy from the previous zero universe.

So we see WHAT? = (((SAME REPEATED INFINITE) REPEATED ORDER (NOT SAME)) = (?) or something like that. Essentially the **4 cell matrix allows all foundations to pattern** - its just the neatness of the relationships that matter i.e. making the concept of INTEGER (ORDER, SEQUENCE) to appear neatly in the cells.



CHAOS and ORDER  
PATTERN =



We end up with CHAOS and ORDER - zero represents CERTAINTY (DEATH, endless loop ZERO, INFINITY) - we resolve energy and process and things to the same unit (Entropy) because want both SAME (=) and DIFFERENT which looks a bit like matrix algebra [https://en.wikipedia.org/wiki/Matrix\\_\(mathematics\)](https://en.wikipedia.org/wiki/Matrix_(mathematics)) SEE Pavel Guerzhoy <http://www.math.hawaii.edu/~pavel/fibonacci.pdf> Golden Ratio, *Fibonacci Rabbits* FIBONACCI - HIS RABBITS AND HIS NUMBERS and KEPLER Keith Tognetti School of Mathematics and Applied Statistics, Dark Matter





# A Tale of Structure

In our universe we have chaos, structure, certainty, uncertainty, energy and hypothesis. This allows infinity, zero, time, distance, energy, mass. We can arrange 4 bounded things inside the bounds of our universe – which of course is also a bound. We have 5 clearly patterned bounded things in our local universe. This is common pattern of stability. [https://en.wikipedia.org/wiki/Symmetry\\_\(physics\)](https://en.wikipedia.org/wiki/Symmetry_(physics)) One thing inside our universe carries time and distance as a repeating processes and oscillates forever - we represent that as C\*C (the speed of light) which our most stable thing in our universe. And we can imagine it in a two by two matrix as the top left corner. This is our confirmation bias. On the same row is another thing which looks like our stable thing but its NOT the SAME – its DIFFERENT. We call that Mass (Jean Piaget’s Accommodation, Assimilation).

So we differentiated one dimension by Same and Different.

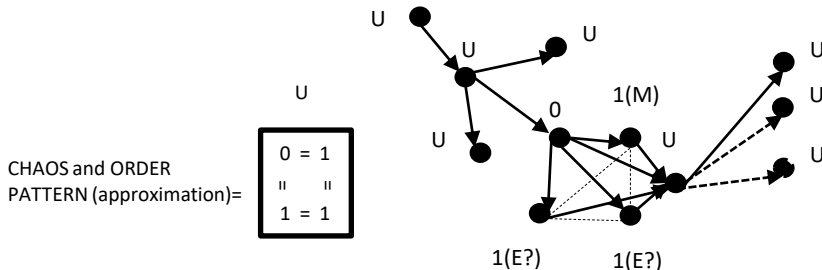
The thing that immediately below the Stable thing arrived at the same moment (we think) as the thing call Mass but we call it ENERGY so we think it was the thing that made the Mass just like that stable thing (photon going in a repeating loop, oscillating, vibrating, etc).

But we know also that there is another Energy type thing the last Box because we have a language which uses EQUALS as logic. So what does the Equal mean? Its not the Same as (Same and Different) but it looks like it. It’s a choice. A Pair of Choices. Of Maybe it is Same and Different and then logic falls apart?

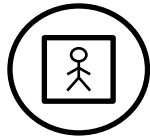
So we have 4 boxes the ENERGY row has two cells we Call ENERGY Hypothesis. We could say – there exists some process (ENERGY) that came from our stable box which also could create boxes just like or stable thing could seem to create our Universe? We get lost in circles but we know the one certain thing is that our Most stable box repeats – So we call that ZERO and that every other thing in the universe box does not repeat – as far as we can tell. So the Hypothesis – the QUESTION is - which universal non-stable box boxes get formed from every stable box – in this case 3 things (all the DIFFERENT TO SAME thing) – 1 each.

So if we can observe between universes [https://en.wikipedia.org/wiki/Quantum\\_tunnelling](https://en.wikipedia.org/wiki/Quantum_tunnelling) we might see chaos, uncertainty and complexity between each universal level (order number), We might be able to reach our past our universes and see other layers and paths? One pattern seems to emerge with the [Fibonacci](#) sequence and clustering of things large enough to observe. Photons and electrons are too big to notice the chaos all around them in their universe the same way we cannot see ours.

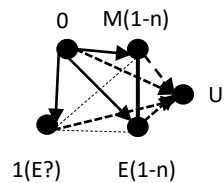
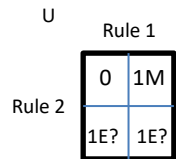
Most of our universe cannot be observed and deep with in it is uncertainty and chaos. The order are the things which stay around long enough and persist enough for us to NOTICE. <https://humanistman.com/wp-content/uploads/2019/07/Absolute-Certainty.pdf> **One Thing I Know With Absolute Certainty is Absolute Certainty Does Not Exist.**



So Maybe it’s a 1 thing in, 4 Things Inside universe (5 objects), 3 things out model with complex and hypothetical relationships inside each universe so the in is 0 (within the universe) and the 3 outs are universes with match another universes in 0. The universe input is the Zero Bound and the output is the Universe bound. The Hypothesis Energy combined with Mass allows stuff to happen inside the universe (Entropy) until it breaks out into another Universe. If we conserve simple rules then each THING creates another universe. So can the 1 M thing can create another universe. The first hypothesis thing E? can create another Universe and the Second hypothesis thing E? can create another universe. How many types of universe can be created from an arrangement of 5 things with one stable Input source?



# Simplify Structure with Rules



From The Einstein Pattern. Universal inputs carry Mass, Energy and what we currently call Time and Space. This is what We Know. We also think there may be something else called Dark Matter but in a universal sense is called the Unknown and represented by ?.

This represents a lack of certainty and also hypothesis. Also infinity (**A-Priori** but it does not have to be?) to understand our frame in the universals. For anything (event) to happen inside a universe there must be choice. For any choice to happen (process, function, action, create) there must be some input, output and rules. (3 things) What are the choices? We Have Rules –

**Rule 0:** 2 Inputs to choice produce 1 Output (can output be a pair? – if we already made one thing called a pair?)

**Rule 1:** for **SAME** / Different which we call **Certainty** (this makes the zero instance **SAME** and infinite integer number line Different using the same/different rule to infinity). So ZERO =SAME. (which cannot be used as output)

**Rule 2: Choice** which is for **hypothesis, experiment, explore, complexity** and the **UnKNOWN**. (entropy)

4 Possible Results are Certain Choice, Different Choice (our path) , Certain Hypothesis, Different Hypothesis (our process) (we escape our universe with a different hypothesis – into chaos and uncertainty)

**Rule 3: SAME (ZERO. it's a fixed input channel) cannot be output within Universe.** (this allows loops between universes)

**Rule 4: Output can be put inside the universe (Different) or Outside the universe (to another U).**

**Rule 5: Choice Repeats (infinitely but it does not have to)** - inside the universe this becomes the level, hierarchic concept or Count of Choice of all the differences instances and all the different , differences (complexity in our universe to our rules based on our choices)

**Pattern:** Matter inside the universe tends to grow (greedy) in difference and number (its easier to choose matter than another universe)

**Pattern and Rule:** inputs can be anywhere from within a universe. (Choice is a combination of matter, energy, (time, space) and hypothesis – the unknown and uncertain.)

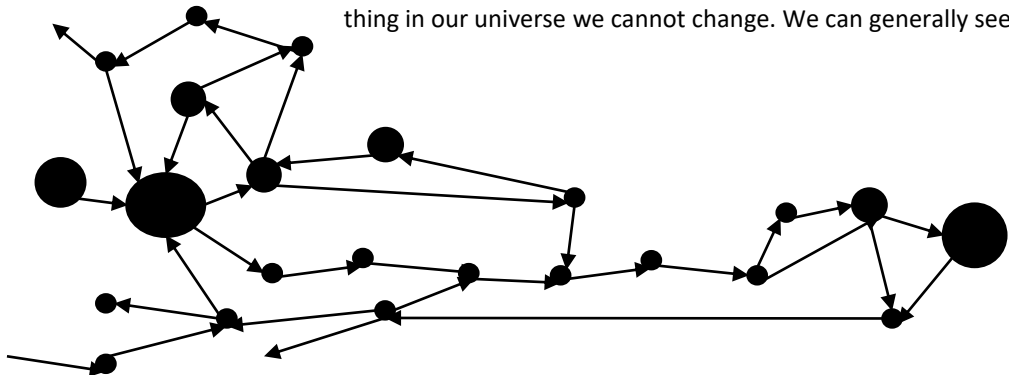
**Is this the Universal Choice Pattern? Input, Rules, Storage (like fairy tales)**

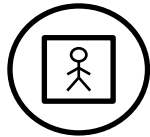
**Universal Rule: Any universe can have one Input Connection (from many other universes) and one Output Connection TO universes.**

With this model we see that connecting to many other universes along many paths is possible and also looping, also we see pruning longer looping paths for shorter paths just on the basis that there is a pattern of choosing internal universe storage to sending outside the universe (explore, discover, path). So we get optimization and numbers, (universal path count). We have not explained the stuff of life or What started everything but we have a frame we can use with the complexity. We cannot know or remember (infinity) some of the paths we travel if we are back in the same universe – where they end or start. All we have is our Universal frame. What we see as input could come from many universes but can only be one thing in our universe we cannot change. We can generally see about 3 levels of patterns in any direction (“orbits, pi”)

0 (start and end), 1, pairs, choice, Numbers, Events, Statistics, Probability, Euler's [Number](#), [Markov Chain](#), [Bayes](#), [Poisson](#) ,

**Markov Chains Explained Visually** By Victor Powell with text by Lewis Lehe <https://setosa.io/ev/markov-chains/> [Pairs](#), [Feynman Diagrams](#), [Higgs Field](#) (Universe), [Fermions](#), Bosons (Higgs), Cohesion,...





# Patterns – a useful approximation

Most of my patterns align with this universal model – and so do many others: Kepler ([NASA](#) – more planets than stars) [Galileo](#), [Copernicus](#), [Mandelbrot](#), [Taoism](#), [Benford's Law](#), Fibonacci [spiral](#), [Edwin Hubble](#) and [Telescope](#), Einstein, [Demming](#) (Quality Patterns ([Ronald Fisher](#) (Natural [Selection](#), [Contingency Tables](#)) 95% - 2 Standard Errors)), [A.W.F. Edwards](#), [Shannon \(Communication Noise\)](#), [Dark Matter](#) (95% observable universe), Biology, [Darwin](#) (survival, cohesion), [Jean Piaget \(stages\)](#), DNA (Watson Crick)/RNA/Nucleic Acid/Amino Acids/Proteins/Molecules/Atoms/[Ernest Rutherford](#), [Probability](#), [Niels Bohr](#), Chemistry, Wolfgang [Pauli](#), Physics, [Higgs Boson](#) (CERN), etc. Patterns repeat. [Jordan Peterson](#) (Maps of Meaning, 12 Rules for life)

Interesting that Demming's Quality, [2 Standard Errors](#) and Shannons Noise show a 95% observable (certain/same/stablity) idea and a 5% noise (chaos uncertainty) idea. Where the dark matter estimate for the universe is 95% - the other way around. So it could mean that what we observe as noise is the bigger picture and our 95% of certainty is really 5% of the bigger picture. This of course is recursive (like everything is). So its not observable from any objective frame of reference either. We use 5% of our observable 5 levels of frames to see that we have successfully assembled in our local frame 95% of our local universe certain stuff. Limits to certainty is recursive. (Sleep and rest) cycles between (internal choice and chaos)? **Areopagitica** :Author(John Milton) :Year(1644) :Keyword(Group Freedom Choice)

Isaac Newton ([Principia](#)), Gottfried Wilhelm [Leibniz](#), [Hendrik Lorentz](#) (1853-1928), [Edward Norton Lorenz](#) (1917-2008), [Poincare](#), [Lindenmayer](#) , [Mitchell Feigenbaum](#)(1944-2019) ([constants](#))) Feigenbaum demonstrates limits to absolute repetition of process – a death loop, heart attack, endless loop, zero at about 8 levels (4 is the time to try something different)) - So in our universes of universes - Maybe these are the unavoidable Nodes where a new universe – a new Zero - MUST be created to survive – the same as the bridging end point in [Leonhard Euler's Seven Bridges of Königsberg](#) – the 5 room puzzle [https://en.wikipedia.org/wiki/Five\\_room\\_puzzle](https://en.wikipedia.org/wiki/Five_room_puzzle)

This has been argued ad-nauseam philosophically as the creator, something/nothing, chicken/egg, zero/infinity, same/different, IS/NOT, closed/open, free will/fate, determinism, laws/rules, metaphysics, induction/deduction, certainty/uncertainty, bounds/unbounded/limits, [di \(2\) lemma](#) , inertia/CHOICE, QUESTION?, etc.

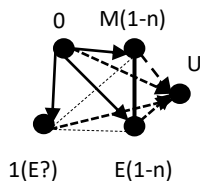
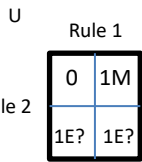
Another way of expressing this is that there is a limit to order and structure, chaos, risk, unknown, uncertainty – is unavoidable – just, as it seems, is order. So as we vacillate between 0 (SAME (death)) and limits of complexity around 4 of whatever Feigenbaum numbers represent – we have to discover other universes and progress a bridge to a new level. 5 has been the pattern so far.



So aligning one of my 5s models to this 5's model: Communication is the start in(g) point – it bombards us, Cooperation (choice 1) is the building and sharing of matter (which is a huge investment of energy and uncertainty), choosing to build cooperatively gives us our universal rules for our universe, trust in the matter and choice process and rules for choice, justice is recognizing the choice process itself – that it is a choice and limited by (uncertainty and complexity) in argument with coherence for (matter and choice). Sustainability must recognize the need to change matter and choices itself constantly. There are limits to certainty.

So humans get heavily biased towards zero. If we are all going to die what's the point? The point is we don't know for certain. If you can get over that bridge you can start to communicate – you might learn something and develop wider frames of the universes. If you can find someone inside your universe to communicate you might co-operate to build rules and stuff – and on it goes. Humans have to cross bridges in their own universe shared with other humans. This pattern is corrupted when people stop communicating : lets look at it this way – there is a 5% chance your universe will improve if you communicate with someone else - and find a way to build on it. Humans get stuck in Death, Choice Loops, Stuff, Rules, and large uncertainty outside the known universe. The brothers Grimm recognized these patterns in their collections of fairy tales. So have many other humans.

[https://en.wikipedia.org/wiki/List\\_of\\_mathematical\\_constants#/media/File:Lemniscate\\_Building.gif](https://en.wikipedia.org/wiki/List_of_mathematical_constants#/media/File:Lemniscate_Building.gif)





# Sir Ronald Aylmer Fisher (17 February 1890 – 29 July 1962)

The Genetical Theory Of Natural Selection by Fisher, R. A <https://archive.org/details/geneticaltheoryo031631mbp/page/n111/mode/2up>

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## VARIATION AS DETERMINED BY

which are not extremely unequal. The distribution of  $z$  for this case is shown in Fig. 7, where it will be seen that for nearly all factors  $z$  lies between  $\pm 6$ , and therefore that the rarer genes scarcely ever occupy less than  $1/400$  of the loci available, and thus are in little danger of extinction.

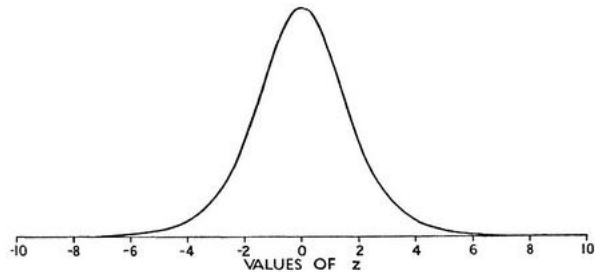


FIG. 7. Distribution of the measure of gene-ratio  $z$ , when the variance is in a state of steady decay, with neither mutations nor selection. The time of relaxation is now twice as many generations as the number of parents in each generation.

The method first developed has certain advantages for examining the frequency distribution in the central region. If  $\theta$  is any measure of gene frequency, the frequency in any differential element  $d\theta$ , may be represented by  $y d\theta$ , and the condition of statistical equilibrium may be put in the form of a differential equation for the unknown function  $y$ . Using the variate defined by

$$\cos \theta = 1 - 2p$$

where  $\theta$  is an angle in radian measure, which increases from  $0$  to  $\pi$  as  $p$  increases from  $0$  to  $1$ , I obtained in 1922 the equation, like that of the conduction of heat,

$$\frac{\partial y}{\partial \tau} = \frac{1}{4n} \frac{\partial^2 y}{\partial \theta^2}$$

which with the solution  $y = \sin \theta$ , leads to a condition of steady decay with time of relaxation equal to  $4n$  generations. The correct differential equation is, however,

$$\frac{\partial y}{\partial \tau} = \frac{1}{4n} \frac{\partial}{\partial \theta} (y \cot \theta) + \frac{1}{4n} \frac{\partial^2 y}{\partial \theta^2},$$

which while admitting the same solution yields the correct time of relaxation.

Like everything – patterns repeat ... here we see **5/8** appearing (fibonacci, Darwin) and real insight to actual and predicted choices. The confirmation of improbability – chaos, uncertainty and convergence but limits – pairs leading to choice and uncertainty and complexity

[https://en.wikipedia.org/wiki/A.\\_W.\\_F.\\_Edwards](https://en.wikipedia.org/wiki/A._W._F._Edwards) **Anthony William Fairbank Edwards**, (born 1935) is a British statistician, geneticist and evolutionary biologist. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1461012/pdf/10747041.pdf> **Perspectives - Anecdotal, Historical and Critical Commentaries on Genetics - Edited by James F. Crow and William F. Dove - The Genetical Theory of Natural Selection - A. W. F. Edwards** - Gonville and Caius College, University of Cambridge, Cambridge CB2 1TA, United Kingdom

“... it was Darwin’s chief contribution, not only to Biology but to the whole of natural science, to have brought light a process by which contingencies, a priori improbable, are given, in the process of time, an increasing probability, until it is their non-occurrence rather than their occurrence which becomes highly improbable.”” Fisher(1954, p. 91) - **Evolution as a Process (Fisher)**

““Consideration of the conditions prevailing in bisexual organisms shows that . . . the chance of an organism leaving at least one offspring of his own sex has a calculable value of about **5/8**. Let the reader imagine that this simple condition were true of his own species, and attempt to calculate the prior probability that a hundred generations of his ancestry in the direct male line should have left at least one son. The odds against such contingency as it would have appeared to his hundredth ancestor (about the time of King Solomon) would require for their expression forty-four figures of the decimal notation; yet this improbable event has certainly happened.”” Fisher(1954, p. 91)

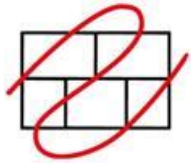
<https://www.nature.com/articles/227092a0> EDWARDS, A. **Likelihood**. *Nature* **227**, 92 (1970). <https://doi.org/10.1038/227092a0>

**For his contributions to biology, Fisher has been called "the greatest of Darwin’s successors".** [https://en.wikipedia.org/wiki/Ronald\\_Fisher](https://en.wikipedia.org/wiki/Ronald_Fisher)



# The 5 room problem – Mersenne, Wallis, Gauss, Planck

If we stuck in a [5 room model \(Euler\)](#) following the paths between different rooms there are only 5 to the power 5 path combinations before we get sick of that and try to **break into** another universe (stop using doors and try something else)



[https://en.wikipedia.org/wiki/Mersenne\\_prime](https://en.wikipedia.org/wiki/Mersenne_prime) - (Marin Mersenne (1588-1648) seminal work on music theory, *Harmonie universelle*, for which he is referred to as the "father of acoustics".[1][2] Mersenne, an ordained priest, had many contacts in the scientific world and has been called "the center of the world of science and mathematics during the first half of the 1600s"[3] and, because of his ability to make connections between people and ideas, "the post-box of Europe".[4] He was also a member of the Minim religious order and wrote and lectured on theology and philosophy. ) that is 2 to the power n -1 combinations  $M_n = 2^n - 1$  for some integer n The exponents n which give Mersenne primes are 2, 3, 5, 7, 13, 17, 19, 31, ... (sequence A000043 in the OEIS) .. If n is a composite number then so is  $2^n - 1$ . ( $2^{ab} - 1$  is divisible by both  $2^a - 1$  and  $2^b - 1$ .) This definition is therefore equivalent to the definition as a prime number of the form  $M_p = 2^p - 1$  for some prime p.

More generally, numbers of the form  $M_n = 2^n - 1$  without the primality requirement may be called **Mersenne numbers**. Sometimes, however, Mersenne numbers are defined to have the additional requirement that n be prime. The **smallest composite Mersenne number with prime exponent n** is  $2^{11} - 1 = 2047 = 23 \times 89$ .

**NOTE how 11 is a number between between the 4<sup>th</sup> (7) and 5<sup>th</sup> (13) Mersenne prime**

Mersenne primes  $M_p$  are also noteworthy due to their [connection to perfect numbers](#).

As of April 2020, 51 Mersenne primes are known. The [largest known prime number](#),  $2^{82,589,933} - 1$ , is a Mersenne prime.<sup>[1]</sup> Since 1997, all newly found Mersenne primes have been discovered by the [Great Internet Mersenne Prime Search \(GIMPS\)](#), a [distributed computing](#) project on the Internet. John **Wallis (1616-1703) Product** [https://en.wikipedia.org/wiki/Wallis\\_product](https://en.wikipedia.org/wiki/Wallis_product), [Gauss's Constant](#), Square root of i (imaginary number) =

$$\sqrt[4]{-1} = \frac{1+i}{\sqrt{2}} = e^{i\frac{\pi}{4}} = \cos\left(\frac{\pi}{4}\right) + i \sin\left(\frac{\pi}{4}\right)$$

[https://www.archimedes-lab.org/How\\_to\\_Solve/5\\_rooms.html](https://www.archimedes-lab.org/How_to_Solve/5_rooms.html)

$$\frac{\pi}{2} = \prod_{n=1}^{\infty} \frac{4n^2}{4n^2-1} = \prod_{n=1}^{\infty} \left( \frac{2n}{2n-1} \cdot \frac{2n}{2n+1} \right) = \left( \frac{2}{1} \cdot \frac{2}{3} \right) \cdot \left( \frac{4}{3} \cdot \frac{4}{5} \right) \cdot \left( \frac{6}{5} \cdot \frac{6}{7} \right) \cdot \left( \frac{8}{7} \cdot \frac{8}{9} \right) \cdot \dots$$

[https://en.wikipedia.org/wiki/Planck\\_units](https://en.wikipedia.org/wiki/Planck_units) Plank units have 5s in them as well.

So imagine that paths (SAME(door)- path - Different(door)) (looks a little like Einstein's equation (C is our bouncing technique)) our basic differentiation model within a 5 room house and each room of that house can **break out** to another 4 rooms (each of those break out too) somewhere else and then so on for about 5 times before we can never get back to where we came from. So we travel in infinity from single same to 2 to 5 – we have strong cohesion around those numbers. Somewhere in the 3 level we can choose 1 level forward or 2 level back type stepwise development and progression to discover the new sets of rooms. Our local universe is 5 to the power 5 (5 times) – the whole universe is infinite.

The sequence 1,1,2,5 on N.J.A. Sloane's database [:https://oeis.org/search?q=1%2C1%2C2%2C5&sort=&language=english&go=Search\\_A000108](https://oeis.org/search?q=1%2C1%2C2%2C5&sort=&language=english&go=Search_A000108) Catalan numbers:  $C(n) = \text{binomial}(2n,n)/(n+1) = (2n)!/(n!(n+1)!)$ . Also called Segner numbers. (Formerly M1459 N0577)

Table 2: Base Planck units

Name	Dimension	Expression	Value (SI unit) <sup>[2]</sup>
Planck length	Length (L)	$l_P = \sqrt{\frac{\hbar G}{c^3}}$	$1.616\,255(18) \times 10^{-35} \text{ m}^{[7]}$
Planck mass	Mass (M)	$m_P = \sqrt{\frac{\hbar c}{G}}$	$2.176\,435(24) \times 10^{-8} \text{ kg}^{[8]}$
Planck time	Time (T)	$t_P = \frac{l_P}{c} = \frac{\hbar}{m_P c^2} = \sqrt{\frac{\hbar G}{c^5}}$	$5.391\,247(60) \times 10^{-44} \text{ s}^{[9]}$
Planck charge	Electric charge (Q)	$q_P = \sqrt{4\pi\epsilon_0 \hbar c} = \frac{e}{\sqrt{\alpha}}$	$1.875\,545\,956(41) \times 10^{-18} \text{ C}^{[10][4][11]}$
Planck temperature	Temperature (Θ)	$T_P = \frac{m_P c^2}{k_B} = \sqrt{\frac{\hbar c^5}{G k_B^2}}$	$1.416\,785(16) \times 10^{32} \text{ K}^{[12]}$



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$$\pi = 16 \left( \frac{1}{5} - \frac{1}{3 \times 5^3} + \frac{1}{5 \times 5^5} - \dots \right) - 4 \left( \frac{1}{239} - \frac{1}{3 \times 239^3} + \frac{1}{5 \times 239^5} - \dots \right)$$
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7. CERN The Early Universe <https://home.cern/science/physics/early-universe> the quarks and electrons of which we are all made. A few millionths of a second later, quarks aggregated to produce protons and neutrons. Within minutes, these protons and neutrons combined into nuclei. As the universe continued to expand and cool, things began to happen more slowly. It took 380,000 years for electrons to be trapped in orbits around nuclei, forming the first atoms. These were mainly helium and hydrogen, which are still by far the most abundant elements in the universe. Present observations suggest that the first stars formed from clouds of gas around 150–200 million years after the Big Bang. Heavier atoms such as carbon, oxygen and iron, have since been continuously produced in the hearts of stars and catapulted throughout the universe in spectacular stellar explosions called supernovae.
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