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The ZIGZAG® DATABASE
and
VISUALIZATION SYSTEM

The true generalization of structure *(still in prototype)*

For the true generalization of documents and media, see Project Xanadu.

Our Zigfinity™ logo.

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That's brilliant, to make a relation a dimension!
--Heinz von Foerster, pioneering 1940s cybernetician

Thanks for showing me your most intriguing way of displaying interconnections on a computer screen. I certainly hope that it catches on.
-- (Sir) Roger Penrose, cosmologist, discoverer of Penrose tiling

This might really surprise you, but your basic motivation for ZigZag, took me until now to meaningfully grasp. It truly is a process of UNLEARNING! The funny thing is that you have done anything and everything possible to plainly state it, your examples are good, your explanations clear, yet even someone with a fairly open mind, such as me, takes half a year or more to finally

appreciate it.

-- Harry Mendell,
inventor of music sampling
and brain-wave interfaces

Hey, this is profound!
-- Larry Tesler,
distinguished PARC and Apple veteran

We believe the computer world can be simplified and unified. Today, ordinary people must deal with an appalling variety of programs and mechanisms to maintain their information.

We have discovered a new simplification based on one simple concept: a new, liberated form of data that shows itself in wild new ways.

Conventional data structures-- especially tables and arrays-- are confined structures created from a rigid top-down specification that enforces regularity and rectangularity. .

But this structure (our trademark is ZigZag®) is created from individual relations, bottom-up; it can be irregular and unlimited.

Its uses range from database and spreadsheet to unifying the internals of large-scale software.

SEE THE MOVIE AND TRY IT HANDS-ON. First, see the movie. But almost no one understands the ZigZag concept without trying it hands-on, so we urge you to do so (with the Starter Kit).

TRY IT HANDS-ON	***SEE THE MOVIE***	***READ ALL ABOUT IT***	***ZIGZAG VERSIONS***
Adam Moore has kindly set up a demo showing the royal families of Europe in hyperthongonal structure (zzstructure). Walk through it on your Mac or PC. **Download our ZigZag-gzz Starter Kit. Inside the zipfile you will find a folder, "ZigZag-**	**(9 minutes).** **Adam Moore, raconteur and biochemist, takes us on a tour de force of bioinformatics-- with explorable animations based on hyperthogonal data (zzstructure).** ***YOU DON'T HAVE TO KNOW CHEMISTRY TO***	**We have a peer-reviewed article on the structure and its implications, in the British Computer Society's on-line *Journal of Digital Information*.)** **Once you get past**	**We are working on an industrial version of ZigZag (Rzz); meanwhile we are giving away Gzz, the beautiful Finnish prototype by Tuomas J. Lukka (elegant graphics and interaction, but unstable). It's in the Starter Kit.** **Les Carr's web-based Lzz at the University of Southampton is a**

gzz". Put it in Windows C: or on Mac Desktop. **(Requires Java.)** **Inside you will find** **- Mac fireup directions** **- PC fireup directions** **- walkthrough instructions** **- power-user instructions, in case you really love it.** ***ENJOY!***	***APPRECIATE WHAT'S HAPPENING ON THE SCREEN.*** **Watch it directly HENCE, or for a better view, download all 40 meg (right-click and "save link as").** **Be sure to watch all nine minutes-- the animation of the Krebs cycle at the end is not to be believed.** **HERE'S THE DATA if you want to follow it hands-on. (Best to learn the interface first through the Starter Kit.)**	**the title the rest is easy.** **(The title is "A Cosmology for a Different Computer Universe: Data Model, Mechanisms, Virtual Machine and Visualization Infrastructure".** **Warning: LOADS SLOWLY. (Also available for download in various formats, including PDF.)**	**delightful variant. Other previous versions (Azz, Ezz, Zzz and Mantra Server) are of theoretical and historical interest but we don't have time to explain them right now.**

THE MOST GENERAL DATA STRUCTURE?

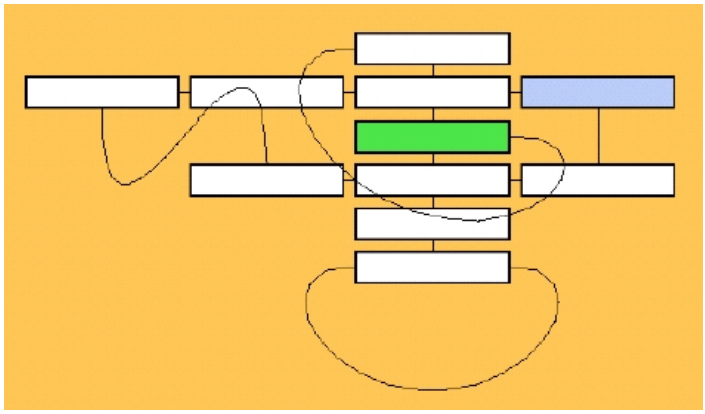
We believe this is the most general data structure, able to replace tables, arrays, spreadsheet and relational database, and intrinsically offering built-in visualizations and hands-on controls.

That structure we call zzstructure, or hyperthogonal structure. Like a table it is composed of cells which are connected in rows and at right angles. But there are no overall spatial coordinates.

In a conventional table, the bottom of one cell is connected to the top of another, the left side of once cell is connected to the right side of another.

We generalize this, and say the top of any cell can be connected to the bottom of any cell, and the left edge of any cell can be connected to the right edge of any cell.

This allows building regular tables, regular data arrays (of the old-fashioned Fortran type), and special-purpose irregular structures of great power--including databases that go on and on, rather than being restricted to narrow topics.



A hyperthogonal cluster of cells.
All connections are orthogonal,
as in a conventional table.
Note that this is only one possible visualization
of this cluster.

You may think of hyperthogonal structure as--

- sculptures of cells in three dimensions or more
- crossed lists in multiple dimensions
- irregular constructions of cells at right angles and side-by-side
- crystals of lists in corresponding connection

Hyperthogonal structure adheres to no formal model anybody knows. Nobody's come up with a correct mathematical description, though a number of people have tried (without hands-on experience).

To understand this structure, try it hands-on, and build your own examples.

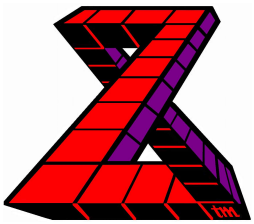
A NEW FRONTIER OF VISUALIZATION

Why would a data structure have built-in views?

Answer. Just as a spreadsheet adds views and operations to a 2D table, allowing you to see and manipulate it, ZigZag adds views, operations and animations to hyperthogonal structure, allowing you to see and manipulate its rich possibilities.

ZigZag views may show any aspect of hyperthogonal structure in any way, adapting it for particular user purposes. Designing these new views is a frontier of visualization.

Our Zigfinity logo says it all:



locally rational,
globally paradoxical,
yet somehow comprehensible.
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