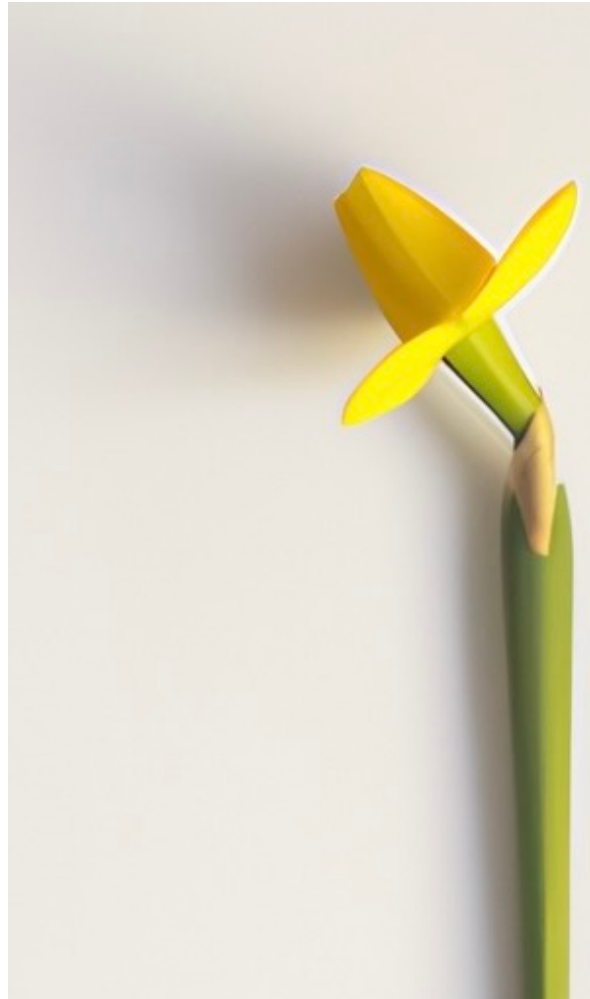


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# Computers Are A New Medium



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Why Are We Still Using 2D  
Notations For The New 4D  
Medium?

Computers are 4D - a new  
medium for expression

The previous medium for  
expression is 2D

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## 2D Medium

- printing press
- paper
- papyrus
- clay tables
- etc.

## *Advantages*

- medium already exists, tried and tested
- inexpensive
- optimized over time
  - scrolls -> books
  - clay tablets -> papyrus -> paper
  - cave walls -> canvas

## *Disadvantages*

- mathematical notation is a workaround to accommodate limitations of the restricted medium
- paper deteriorates over time - doesn't persist through eons
- slow evolution
  - latest advancement is the use of graphite and rubber in lieu of opaque inks
- physics exploration has been constrained by mathematics notation, and, ignores multi-dimensional reality
- Richard Feynman
  - abandoned 2D math notation and used diagrams to explore a specific phenomenon
- Ilya Prigogine
  - Nobel Laureate
  - "Order Out Of Chaos"
    - claims that functional-only thinking set physics back by 100 years

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## 4D Medium

x/y/z/t

### *Advantages*

new ways of exploring problem spaces

### *Disadvantages*

- deterioration
  - If power goes out, data lost
  - rapid advancement of storage media, e.g. difficult to read data from only 50 years ago
- Not yet well understood
- Needs invention of new notations

### *Circling Around The Flame*

- Flash
- YouTube
- T.V.
- Film / Video
- streaming
  - Netflix
  - etc.
- Timeline editing for video, and, audio
- Visual REPLs
  - “live coding”
  - Worry Dream

### *Obsolete Ideas*

- desktop metaphor
- text-only programming languages
  - Based on 1950s hardware constraints
  - Based on grids of non-overlapping cells of fixed-size bitmaps
  - Text-based programming languages encourage synchronous expression, whereas Reality is asynchronous
- Filing cabinet metaphor, files
- Documents as static sheets of paper

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## Multiple Notations

- humans cannot deal with too many dimensions at once
- Physicists learn to use “simplifying assumptions”, i.e. multiple notations to express multiple aspects of the *same* phenomenon
- Mechanical Engineers learn to make drawings of physical objects from at least 3 views
  - Multiple static views were required by reliance on paper (top view, front view, side view)
  - “3D” visualization changes the toolchain
- UNIX pipelines allowed composition of multiple programming languages into single applications
  - Pipelines are conflated with heavy-weight concepts such as “operating systems”, hence, overlooked
  - processes are just closures implemented in a heavy-handed manner (see Greenspun’s 10th Rule)
- MMU hardware
  - Needed to protect apps from one another
    - Game cartridges: different way to achieve the same result, with less software bloat
    - MMUs not needed within a single app
      - a *bug* is just a *bug*, the goal is 0 bugs.
  - Mutual multitasking
    - Overlooked due to conflation with app-vs.-app protection, instead of subroutine-vs-subroutine needs
  - End-users don’t need MMUs
    - Except when using bug-ridden software
    - Developers want hardware assist during development

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# Programming Simplicity

[https://en.wikipedia.org/wiki/Greenspun's\\_tenth\\_rule](https://en.wikipedia.org/wiki/Greenspun's_tenth_rule)

[https://en.wikipedia.org/wiki/Feynman\\_diagram](https://en.wikipedia.org/wiki/Feynman_diagram)

<https://www.penguinrandomhouse.ca/books/643445/order-out-of-chaos-by-ilya-prigogine-and-isabelle-stengers/9781786631008>

## See Also

**References** <https://guitarvydas.github.io/2024/01/06/References.html>

**Blog** <https://guitarvydas.github.io/>

**Blog** <https://publish.obsidian.md/programmingsimplicity>

**Videos** <https://www.youtube.com/@programmingsimplicity2980>

[see playlist “programming simplicity”]

**Discord** <https://discord.gg/Jjx62ypR>

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