Mapping the information processing pathways of the cortex: challenges and opportunities

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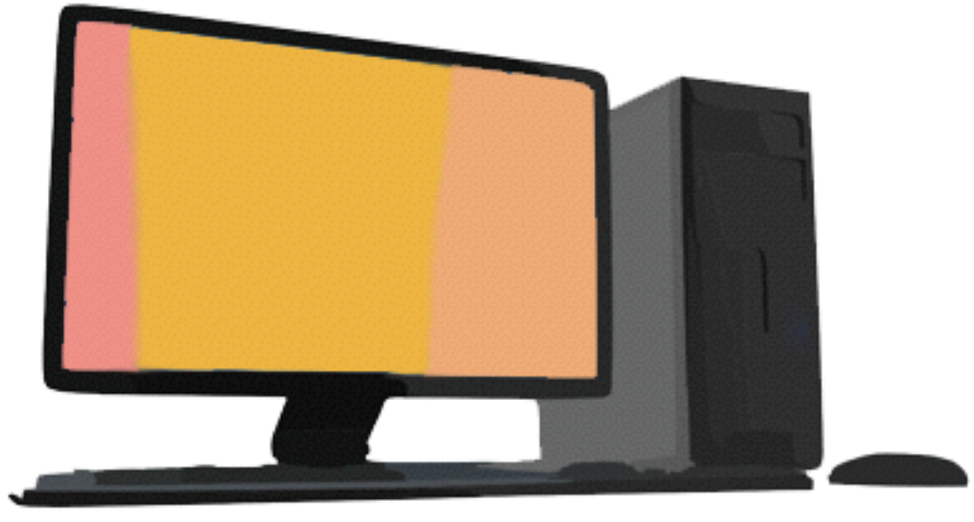
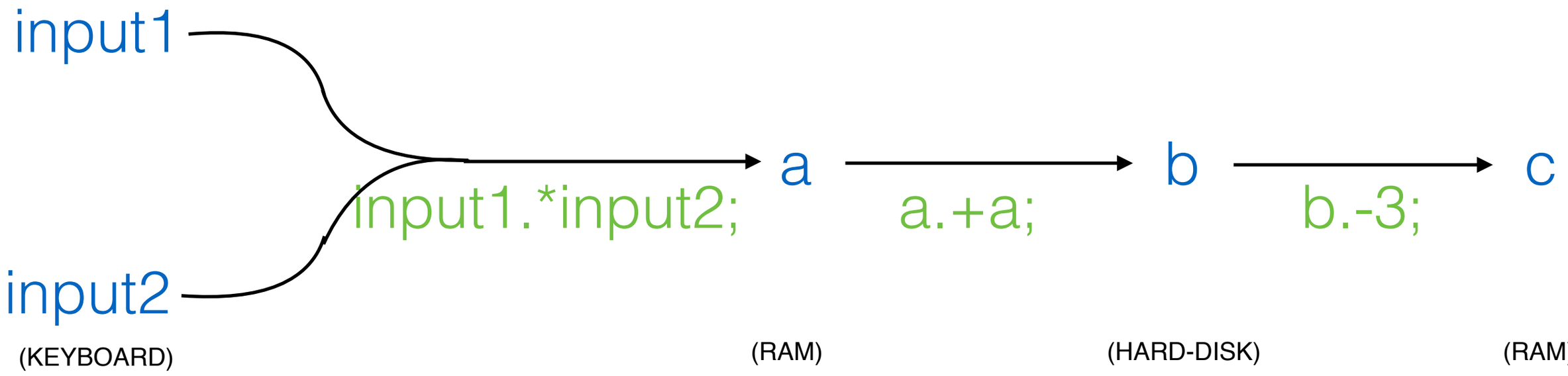
How does a computer work?

?



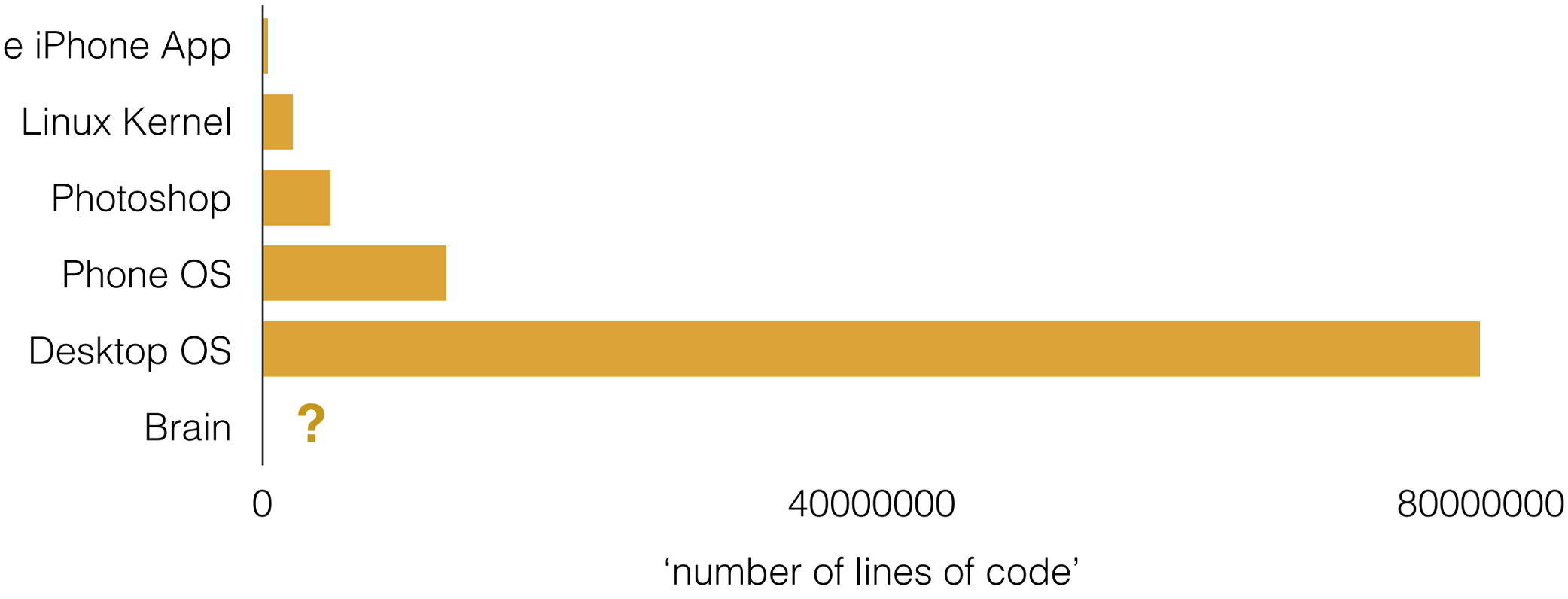

input1
input2
input1.*input2;
a
a.+a;
b
b.-3;
c
(KEYBOARD)
(RAM)
(HARD-DISK)
(RAM)


0ms
latency since input (ms)
100ms

- This ‘map’, if it was comprehensive enough, would tell us a lot about about a computer’s processing and structure.

- We call these maps the *information processing pathways* of the computer.

Complexity



Source: informationisbeautiful.net

Kymata

www.kymata-atlas.org

Challenges

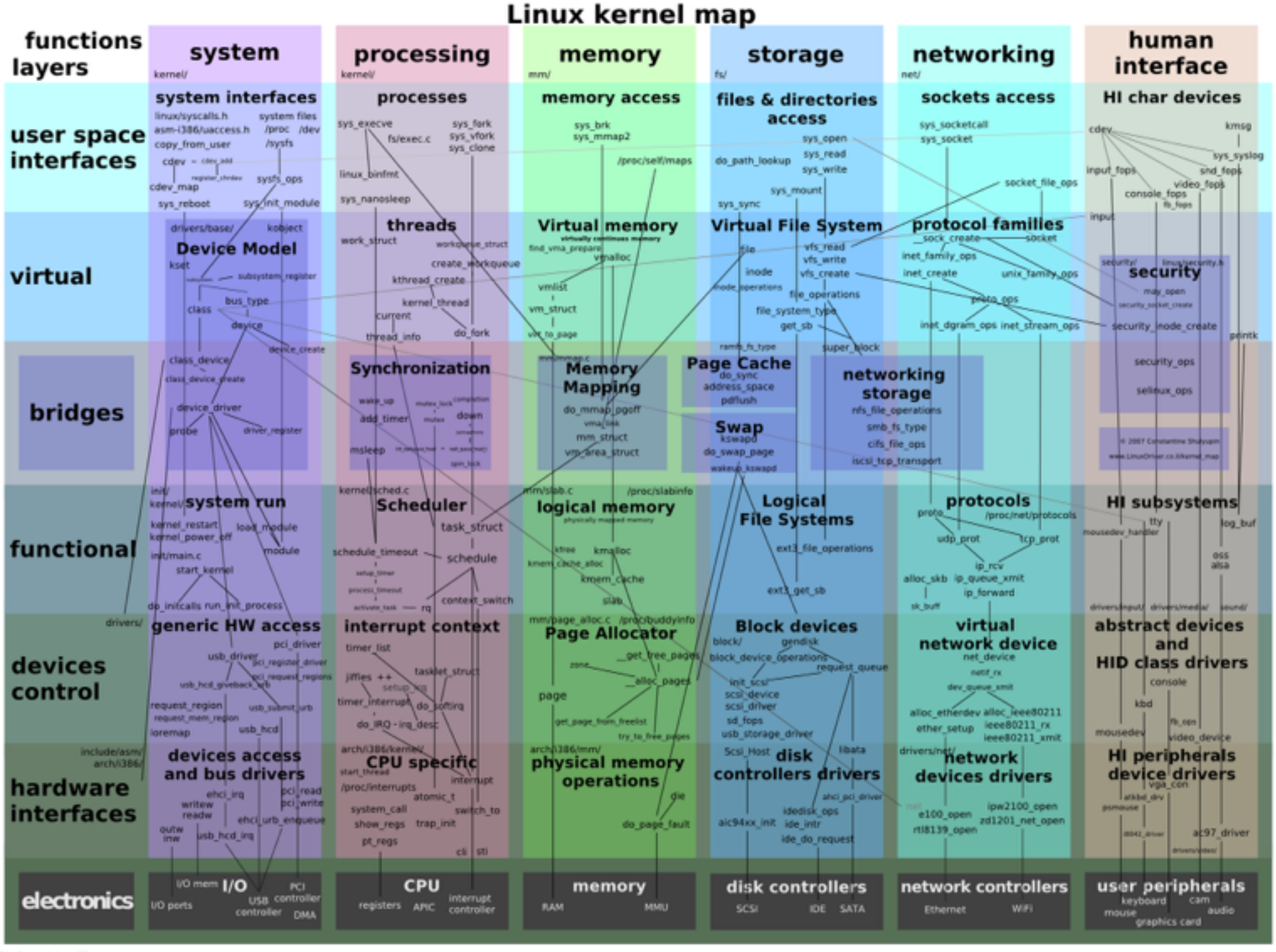
1. Volume

…tens of thousands of arrows,
plus accompanying metadata.

Challenges

2. Lack of structure

Linux kernel map



Ver 0.6, 1/1/2008

Challenges

3. Dimensionality

It is often difficult to show more than three dimensions on paper (two spatial dimensions, plus colour)

We have five major dimensions to display: the 3D brain surface (3), time and ‘evidence’.

Sharing

1. **Permalinks**
   (e.g. https://kymata-atlas.org/index.html#68RA6)
   Primary ‘reference’ mechanism for sharing communication channels (email, Twitter, Facebook etc).

   Allows users to share views, pathways, settings, regions of interest etc.

2. Application Programming Interfaces [APIs]
   (e.g. https://kymata-atlas.org/api/functions/68RA6)
   Allows third parties to access raw data.

Some useful open-source Javascript libraries

- d3js (http://d3js.org)

  Interactive graphs

- threejs (http://threejs.org)

  Interactive 3D

Both HTML5 compatible