Ben Fry

Computational Information Designer

http://www.design.cmu.edu/show_news.php?id=69&m=2006

How much is

295 ?

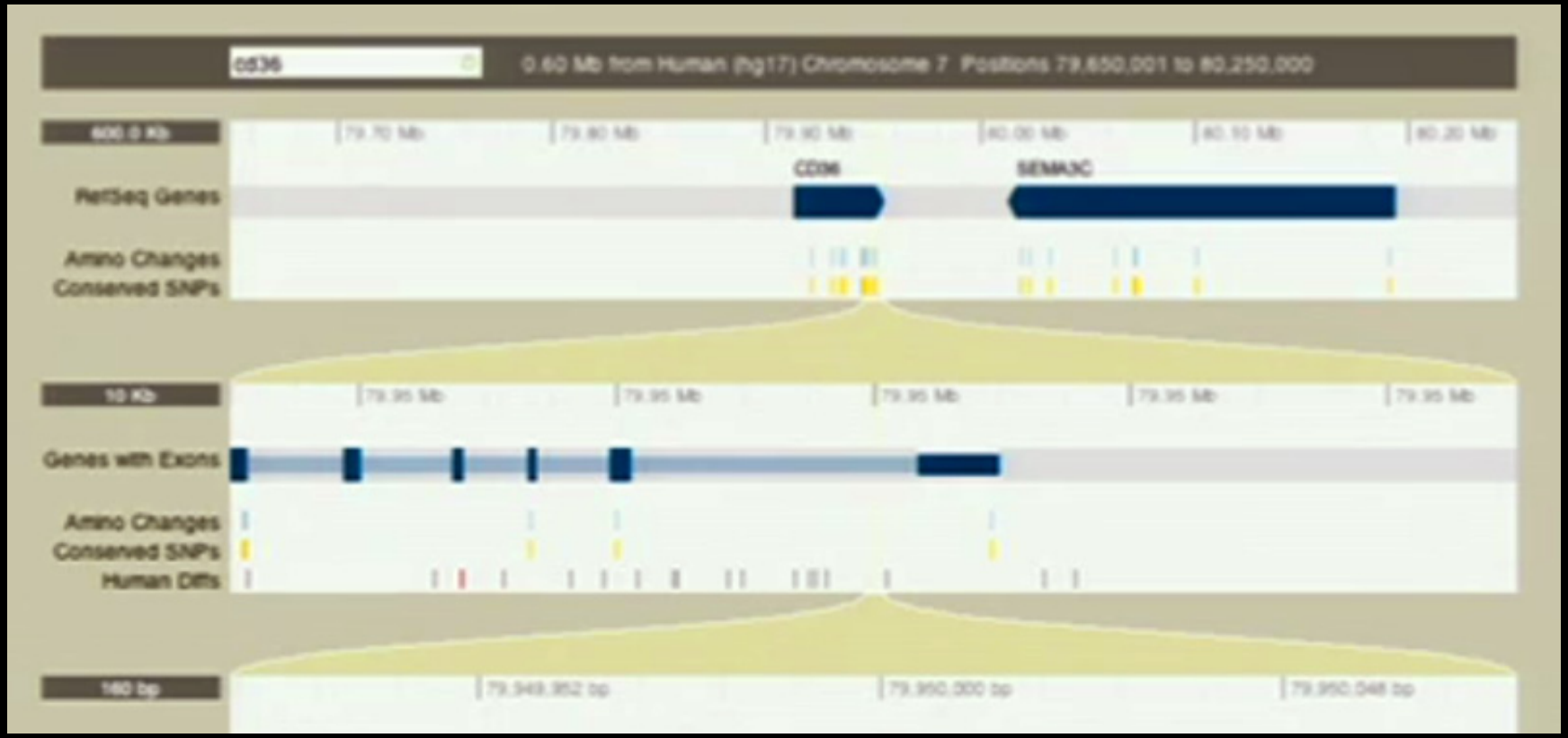
EXABYTES ?

http://news.cnet.com/8301-30685_3-20031295-264.html

DATA

#name	chrom	strand	txStart	txEnd	cdsStart	cdsEnd	exonCount	exonStarts	exonEnds	proteinID
uc001aaa.3	chr1	+	11873	14409	11873	11873	3	11873,12612,13220,	12227,12721,14409,	
uc010nxq.1	chr1	+	11873	14409	12189	13639	3	11873,12594,13402,	12227,12721,14409,	B7ZGX9
uc010nxr.1	chr1	+	11873	14409	11873	11873	3	11873,12645,13220,	12227,12697,14409,	
uc009vi[illegible]	chr1	-	14362	16765	14362	14362	4	14362,14969,15795,16606,	14829,15038,15942,16765,	
uc009vjc.1	chr1	-	16857	17751	16857	16857	2	16857,17232,	17055,17751,	uc009vjc.1
uc009vjd.1	chr1	-	15795	18061	15795	15795	5	15795,16606,16857,17232,17605,	15947,16765,17055,17368,	
uc009vit.2	chr1	-	14362	19759	14362	14362	9	14362,14969,15795,16606,16857,17232,17914,18267,18912,	14829,15038,15947,16765,17055,17742,18061,18366,19759,	uc009vit.2
uc001aae.3	chr1	-	14362	19759	14362	14362	10	14362,14969,15795,16606,16857,17232,17605,17914,18267,18	14829,15038,15947,16765,17055,17368,17742,18061,18366,19759,	uc001aae.3
uc009viu.2	chr1	-	14362	19759	14362	14362	10	14362,14969,15795,16606,16857,17232,17914,18267,18500,18	14829,15038,15947,16765,17055,17742,18061,18369,18554,19759,	uc009viu.2
uc001aai.1	chr1	-	16857	19759	16857	16857	6	16857,17232,17605,17914,18267,18912,	17055,17368,1774	
uc001aab.3	chr1	-	14362	24901	14362	14362	10	14362,14969,15795,16606,16853,17232,17605,17914,18267,24	14829,15038,15947,16765,17055,17368,17742,18061,18379,24901,	uc001aab.3
uc001aah.3	chr1	-	14362	29370	14362	14362	11	14362,14969,15795,16606,16857,17232,17605,17914,18267,24	14829,15038,15947,16765,17055,17368,17742,18061,18366,24891,29370,	uc001aah.3
uc009vir.2	chr1	-	14362	29370	14362	14362	10	14362,14969,15795,16606,16857,17232,17914,18267,24737,29	14829,15038,15947,16765,17055,17742,18061,18366,24891,29370,	uc009vir.2
uc009viq.2	chr1	-	14362	29370	14362	14362	7	14362,15795,16606,16857,17605,24737,29320,	14829,15	uc009viq.2
uc001aac.3	chr1	-	14362	29370	14362	14362	11	14362,14969,15795,16606,16857,17258,17605,17914,18267,24	14829,15038,15947,16765,17055,17368,17742,18061,18369,24891,29370,	uc001aac.3
uc009viv.2	chr1	-	14406	29370	14406	14406	7	14406,16857,17232,17605,17914,24737,29320,	16765,17	uc009viv.2
uc009viw.2	chr1	-	14406	29370	14406	14406	7	14406,16857,17232,17914,18267,24737,29320,	16765,17	uc009viw.2
uc009vix.2	chr1	-	15602	29370	15602	15602	7	15602,16606,16857,17232,17914,24737,29320,	15947,16	uc009vix.2
uc009viz.2	chr1	-	16606	29370	16606	16606	8	16606,16853,17232,17605,17914,18267,24737,29320,	16765,17055,17368,17742,18061,18379,24891,29370,	uc009viz.2
uc009viy.2	chr1	-	16606	29370	16606	16606	9	16606,16857,17232,17605,17914,18267,18496,24737,29320,	16765,17055,17368,17742,18061,18362,18554,24891,29370,	uc009viy.2
uc010nxs.1	chr1	-	16857	29370	16857	16857	8	16857,17232,17605,17914,18267,18912,24737,29320,	17055,17368,17742,18061,18366,19139,24891,29370,	uc010nxs.1
uc009vje.2	chr1	-	17232	29370	17232	17232	4	17232,17914,18267,29320,	17742,18061,18366,29370,	
uc009vjf.2	chr1	-	17605	29370	17605	17605	7	17605,17914,18267,18496,18912,24737,29320,	17742,18	uc009vjf.2
uc009vjb.1	chr1	-	16857	29961	16857	16857	7	16857,17232,17605,17914,18267,24737,29823,	17055,17	uc009vjb.1
uc001aak.2	chr1	-	34611	36081	34611	34611	3	34611,35276,35720,	35174,35481,36081,	
uc001aal.1	chr1	+	69090	70008	69090	70008	1	69090,	70008,	Q8NH21 uc001aal.1
uc001aam.3	chr1	-	137838	139228	137838	137838	1	137838,	139228,	uc001aam.3
uc010nxt.1	chr1	-	89294	237877	89294	89294	2	89294,236614,	90404,237877,	uc010nxt.1
uc001aaq.1	chr1	+	321083	321114	321083	321083	1	321083,	321114,	uc001aaq.1

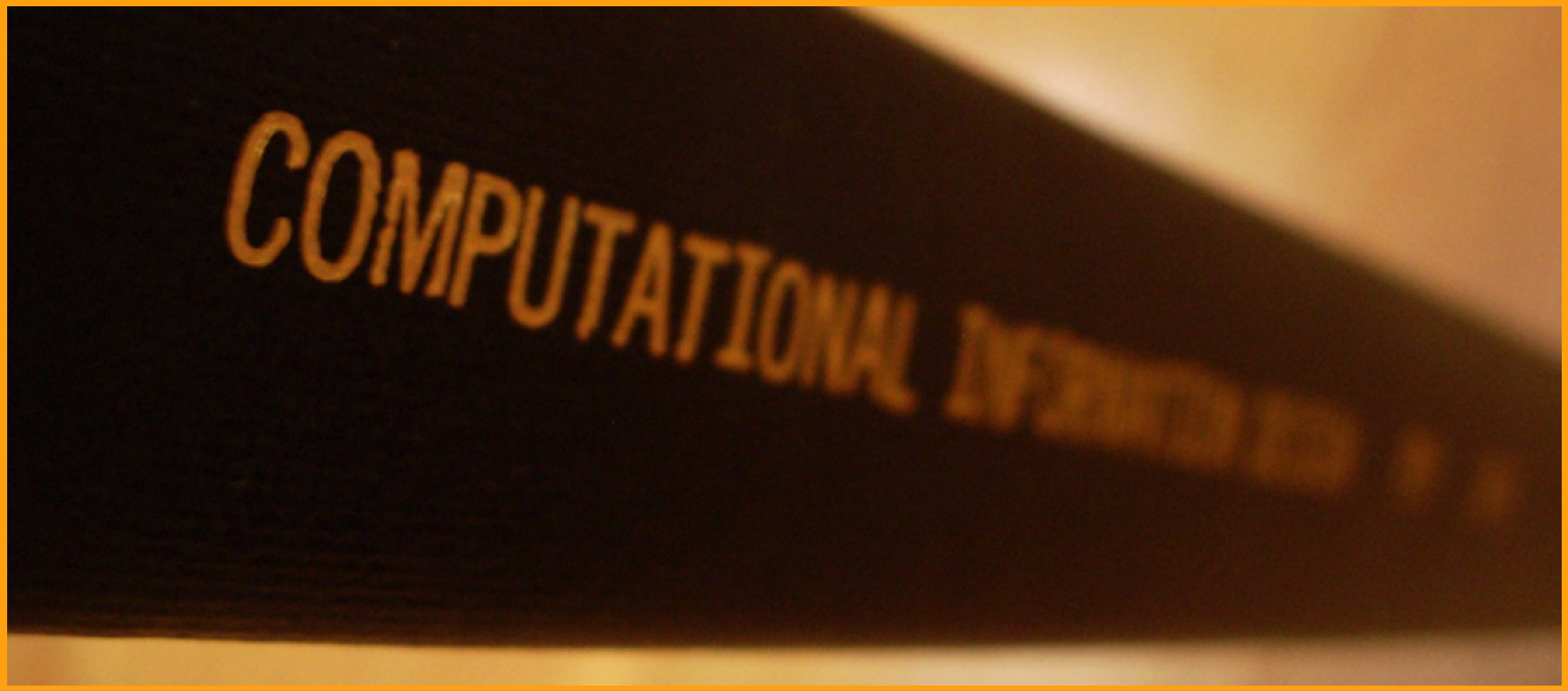
visualization



genome browser

http://vimeo.com/15006552

Dr. Fry



Carnegie Mellon: Design & Computer Science

MIT Media Lab: Computational Information Design

information visualization +

graphic design +

data mining =

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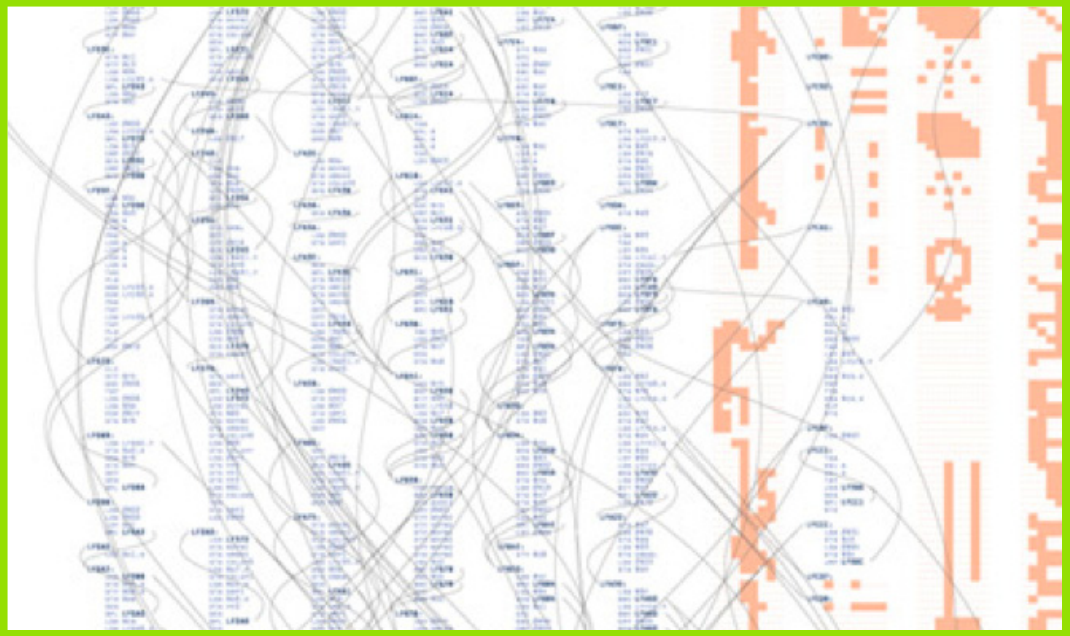
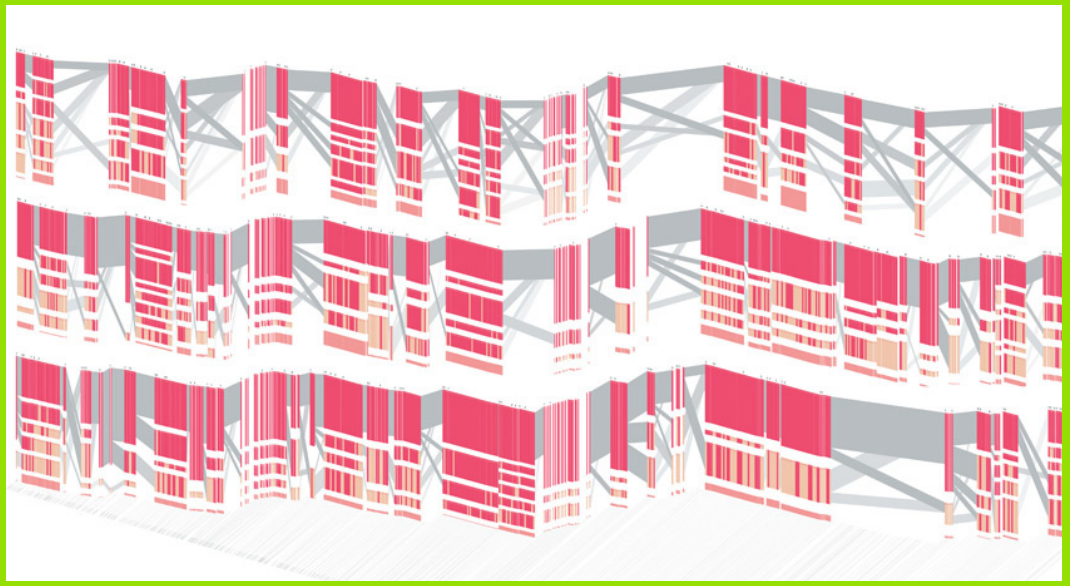
computational information design

citation

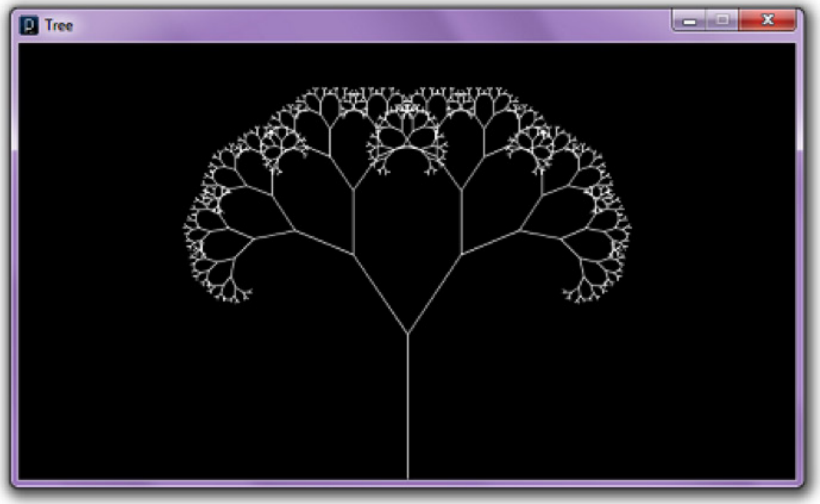




http://www.design.cmu.edu/show_news.php?id=69&m=2006, http://benfry.com/genomevalence/, http://benfry.com/infoseed/, http://www.apple.com/science/profiles/fry/

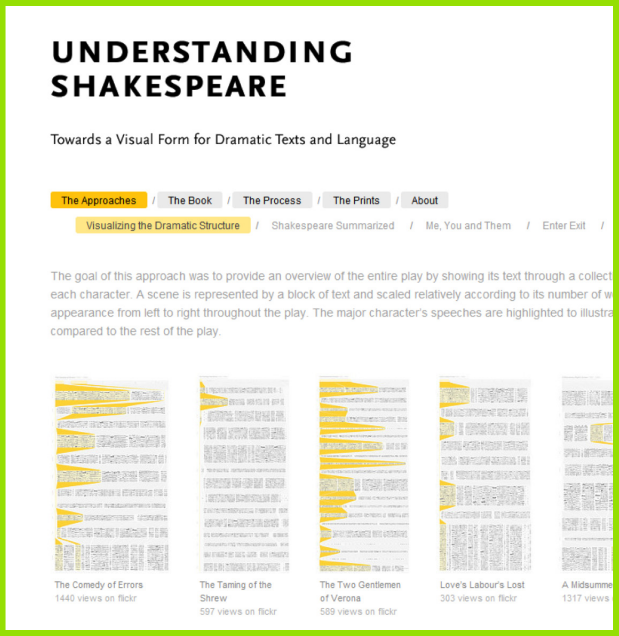
processing

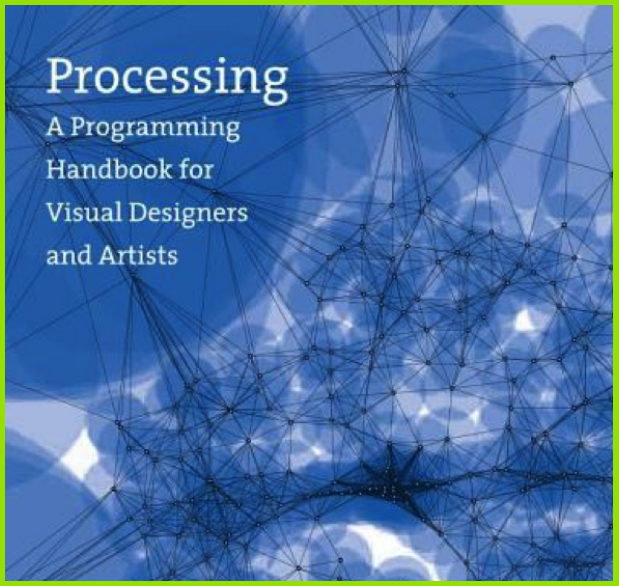
```
/* Recursive Tree
 * by Daniel Shiffman.
 *
 * Renders a simple tree-like structure via recursion.
 * The branching angle is calculated as a function of
 * the horizontal mouse location. Move the mouse left
 * and right to change the angle.
 */

float theta;

void setup() {
  size(640, 360);
  smooth();
}

void draw() {
  background(0);
  frameRate(30);
  stroke(255);
  // Let's pick an angle 0 to 90 degrees based on the mouse position
  float a = (mouseX / (float) width) * 90f;
  // Convert it to radians
  theta = radians(a);
  // Start the tree from the bottom of the screen
  translate(width/2,height);
  // Draw a line 120 pixels
  line(0,0,0,-120);
  // Move to the end of that line
  translate(0,-120);
  // Start the recursive branching!
  branch(120);
}
```



programming for designers | design for progammers

screenshot of application





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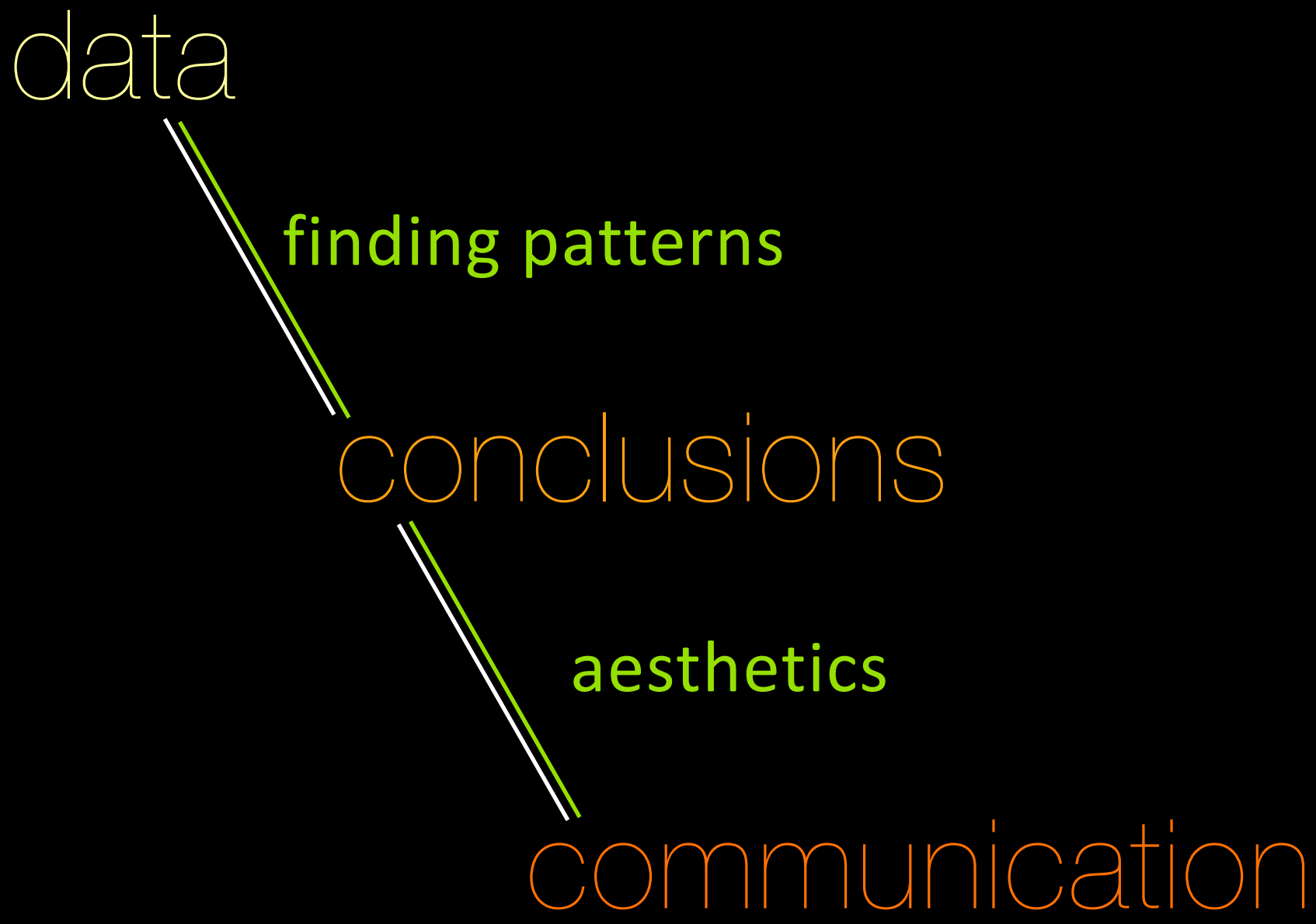
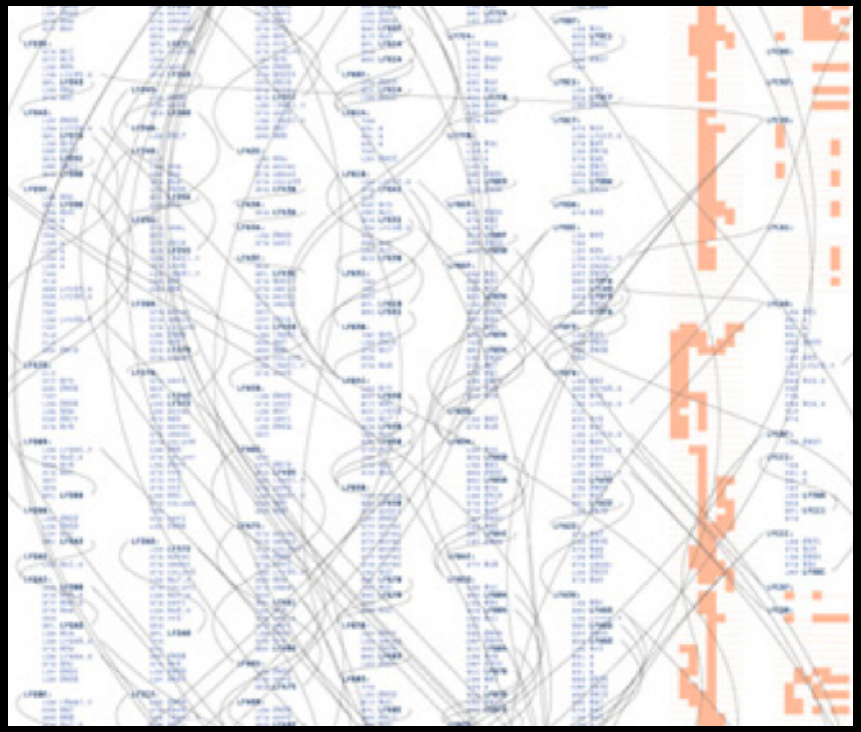

data
finding patterns
conclusions
aesthetics
communication

patterns

#name	chrom	strand	txStart	txEnd	cdsStart	cdsEnd	exonCount	exonSt
uc001aaa.3	chr1	+	11873	14409	11873	11873	3	11873,12612,13
uc010nxq.1	chr1	+	11873	14409	12189	13639	3	11873,12594,13
uc010nxr.1	chr1	+	11873	14409	11873	11873	3	11873,12645,13
uc009vis.2	chr1	-	14362	16765	14362	14362	4	14362,14969,15
uc009vjc.1	chr1	-	16857	17751	16857	16857	2	16857,17232,
uc009vjd.2	chr1	-	15795	18061	15795	15795	5	15795,16606,16
uc009vit.2	chr1	-	14362	19759	14362	14362	9	14362,14969,15
14829,15038,15947,16765,17055,17742,18061,18366,19759,								uc009vit.2
uc001aae.3	chr1	-	14362	19759	14362	14362	10	14362,14969,15
14829,15038,15947,16765,17055,17368,17742,18061,18366,19759,								uc001aae.3
uc009viu.2	chr1	-	14362	19759	14362	14362	10	14362,14969,15
14829,15038,15947,16765,17055,17742,18061,18369,18554,19759,								uc009viu.2
uc001aai.1	chr1	-	16857	19759	16857	16857	6	16857,17232,17
uc001aab.3	chr1	-	14362	24901	14362	14362	10	14362,14969,15
14829,15038,15947,16765,17055,17368,17742,18061,18379,24901,								uc001aab.3
uc001aah.3	chr1	-	14362	29370	14362	14362	11	14362,14969,15
14829,15038,15947,16765,17055,17368,17742,18061,18366,24891,29370,								uc001aa
uc009vir.2	chr1	-	14362	29370	14362	14362	10	14362,14969,15
14829,15038,15947,16765,17055,17742,18061,18366,24891,29370,								uc009vir.2
uc009viq.2	chr1	-	14362	29370	14362	14362	7	14362,15795,16
uc009viq.2								
uc001aac.3	chr1	-	14362	29370	14362	14362	11	14362,14969,15
14829,15038,15947,16765,17055,17368,17742,18061,18369,24891,29370,								uc001aa
uc009viv.2	chr1	-	14406	29370	14406	14406	7	14406,16857,17
uc009viv.2								
uc009viw.2	chr1	-	14406	29370	14406	14406	7	14406,16857,17
uc009viw.2								
uc009vix.2	chr1	-	15602	29370	15602	15602	7	15602,16606,16
uc009vix.2								
uc009viz.2	chr1	-	16606	29370	16606	16606	8	16606,16853,17
16765,17055,17368,17742,18061,18379,24891,29370,								uc009viz.2
uc009viy.2	chr1	-	16606	29370	16606	16606	9	16606,16857,17
16765,17055,17368,17742,18061,18362,18554,24891,29370,								uc009viy.2
uc010nxs.1	chr1	-	16857	29370	16857	16857	8	16857,17232,17
17055,17368,17742,18061,18366,19139,24891,29370,								uc010nxs.1
uc009vje.2	chr1	-	17232	29370	17232	17232	4	17232,17914,18

useful



beautiful