



# Quantum Web Fields and Molecular Meanderings

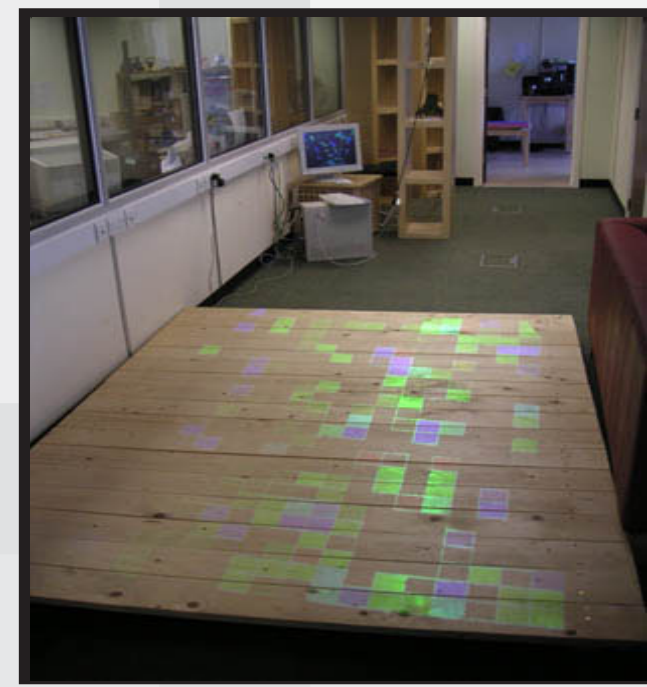
## : Visualising Web Visitations

Geoff Ellis & Alan Dix

Two visualisation algorithms that give an impression of current activity on a web site. Past web activity is used to produce a spatial mapping of pages, which results in highly traversed page links lying close together in the 2D visualisation space. Both focus on giving a sense of the trail of individual visitors to the website.

### inspiration

web visualisation  
awareness  
ambient displays  
social navigation

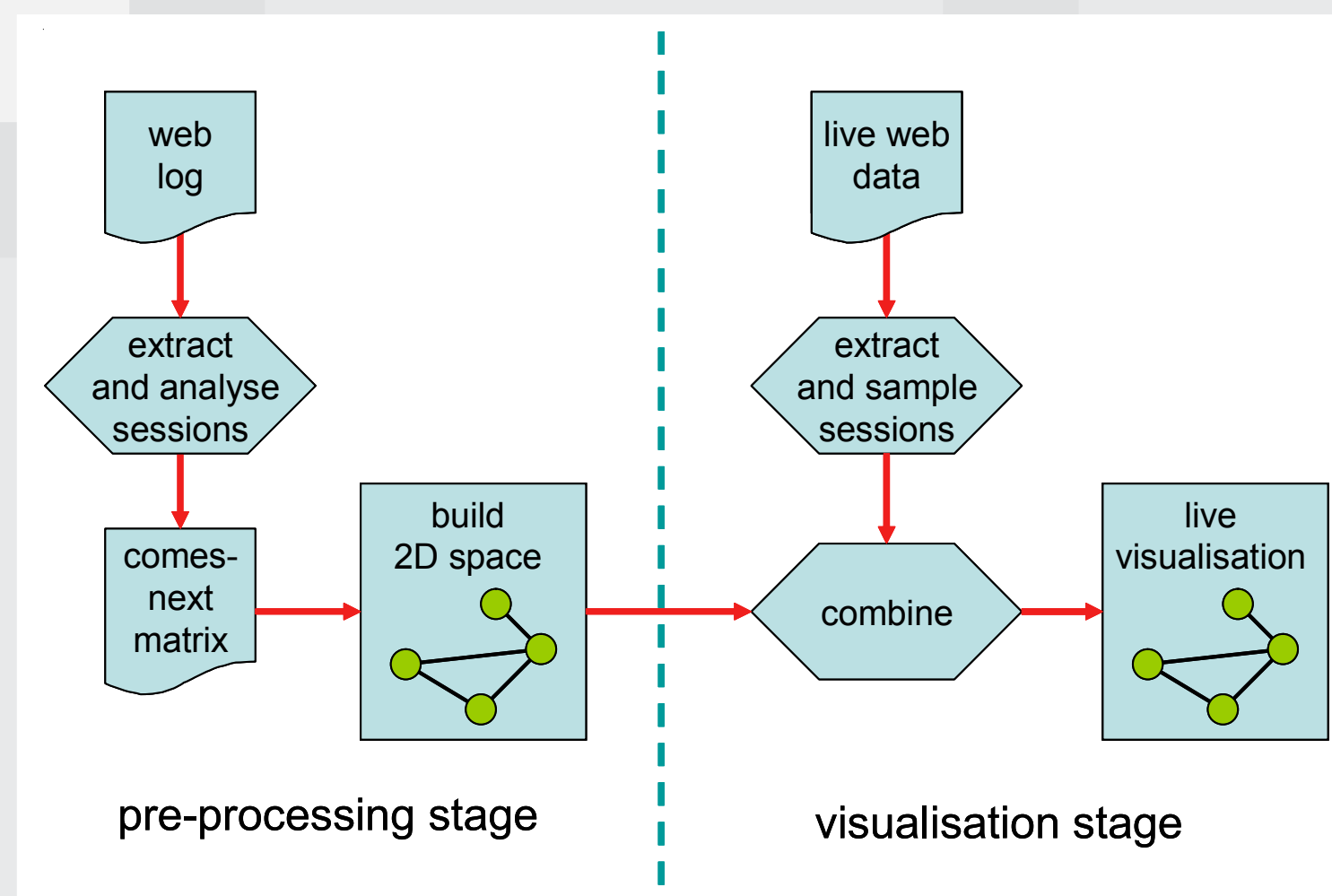


The **Mood Floor** uses a weight sensing floor to record actual footsteps and then records these as small squares at the location of each footfall. Each path across the floor is given a different colour and these fade slowly over time.

Developed by Mike Hazas, Kiel Gilleade, Martin Strobach and Nicolas Villar during the Scrapheap Challenge at Lancaster University

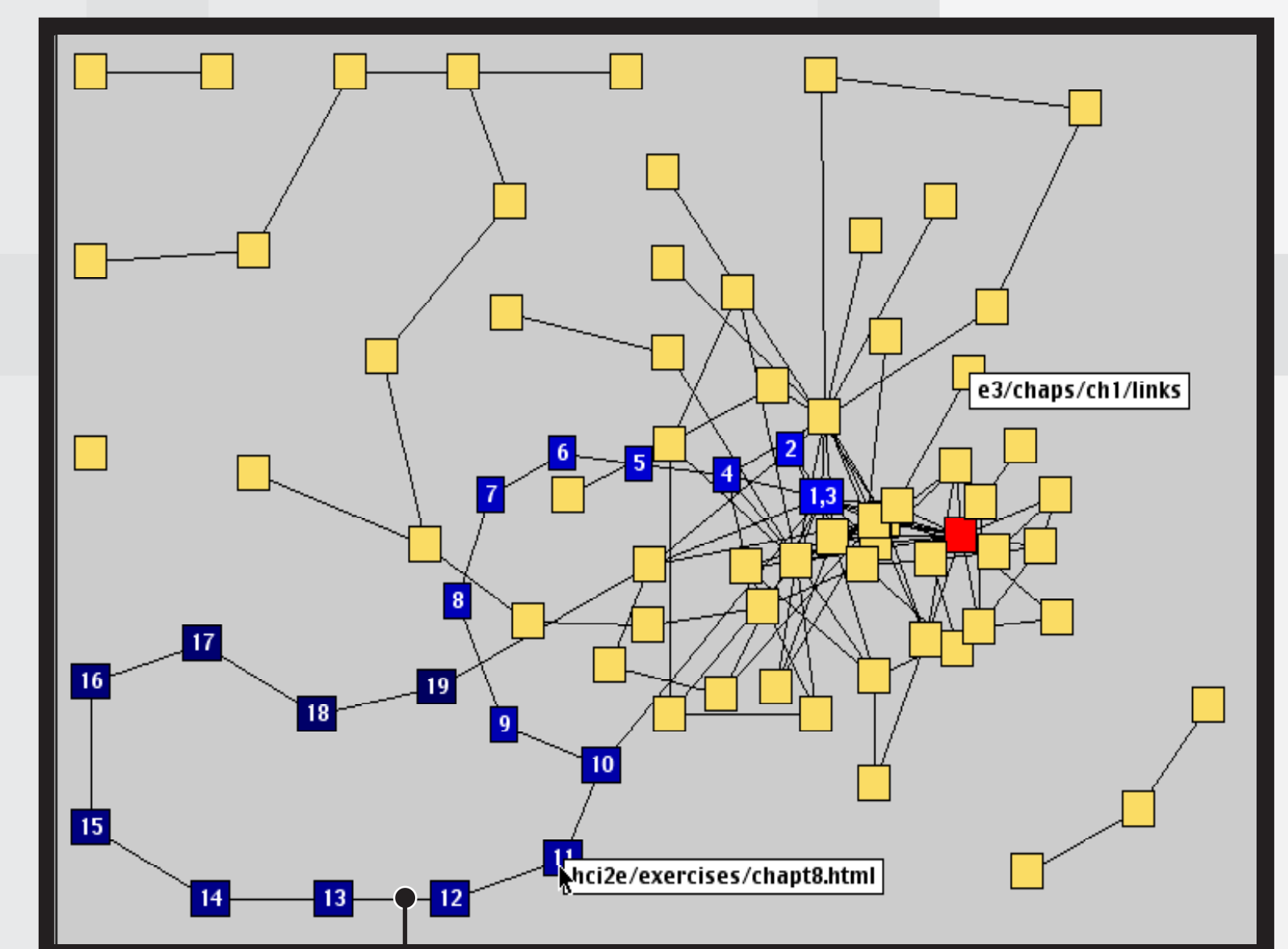
### processing the web logs

- web logs are pre-processed to extract sessions and create co-visitation statistics
- the comes-next matrix is used to produce a 2D visualisation space
- live web visits are sampled
- the sampled sessions are drawn into the 2D visualisation space



### Molecular Meanderer

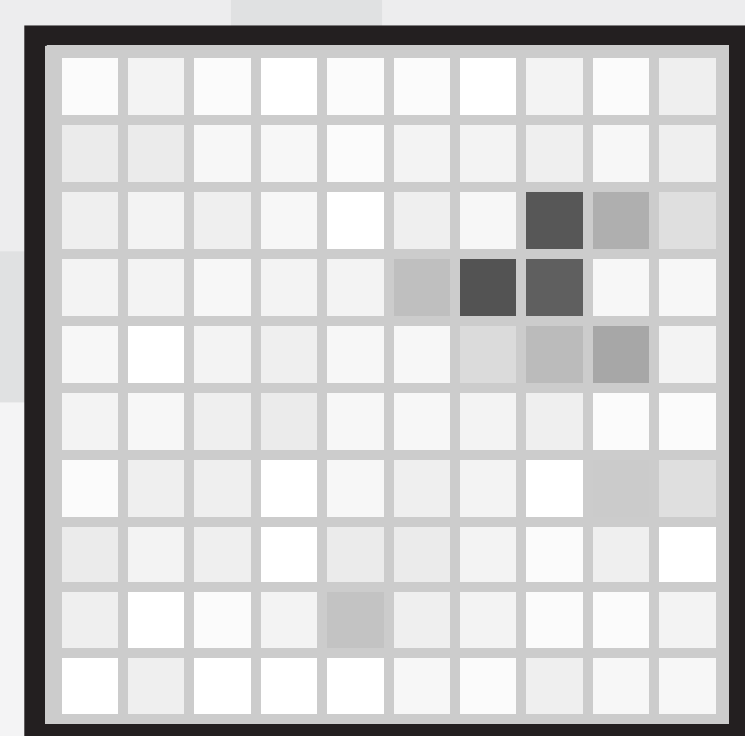
Each Web page is a small square and the lines represent frequently traversed links. The shorter the line the more visitors have taken the hyperlink. The red square is the site 'home'.



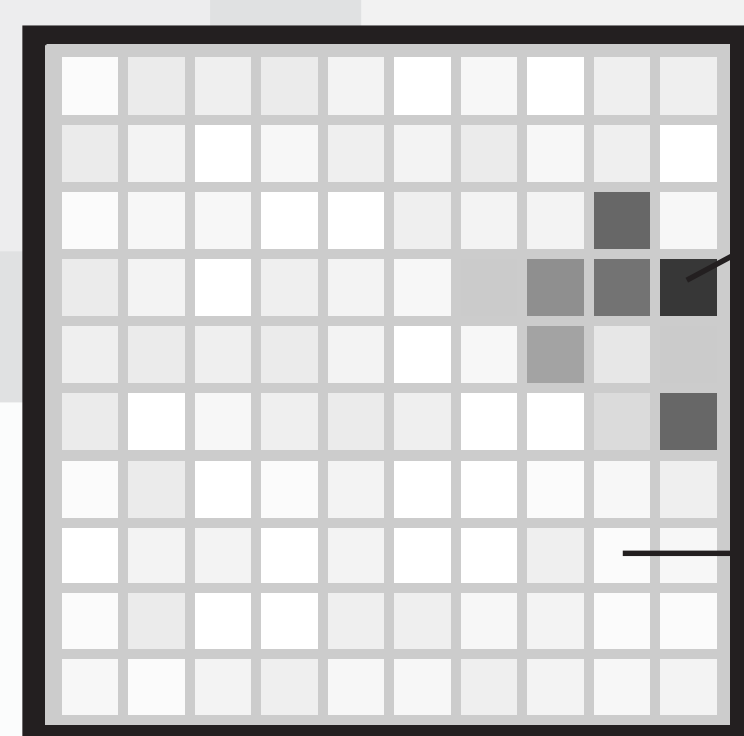
One visitation path is shown numbered and this follows what is clearly a frequent 'linear' path. It turns out that this represents going through the chapter exercise pages in turn.

### Quantum Web Fields

In the world of large-scale phenomena each object has a unique location in space. In the quantum world each particle has a spread out existence - a probability of being at any particular location. Likewise, in the Quantum Web Field, each page is given a probability of being found at each square. These probabilities are arranged so that pages that tend to appear next to one another in session paths have high probabilities on adjacent squares.



e3/chaps/intro/links (77 visits)

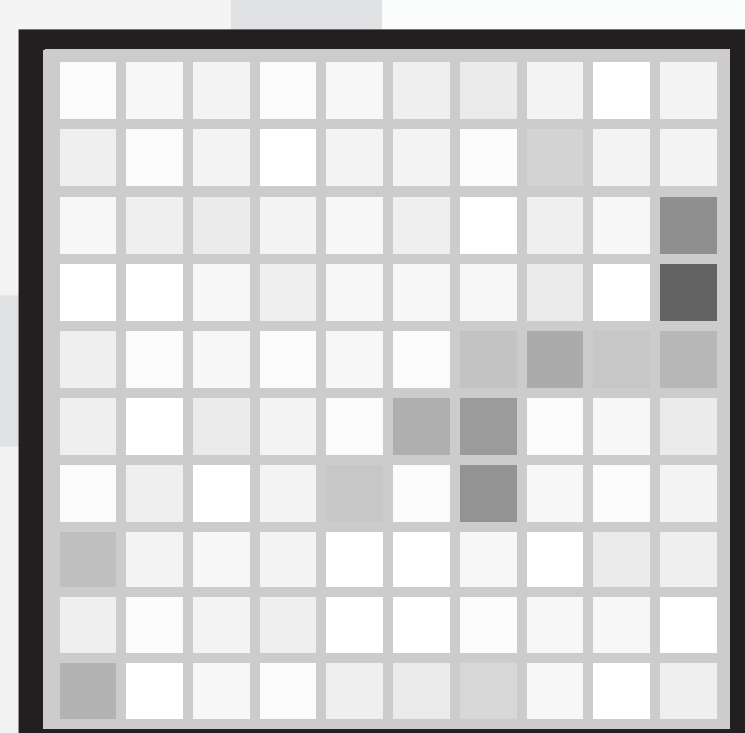


home (1015 visits)

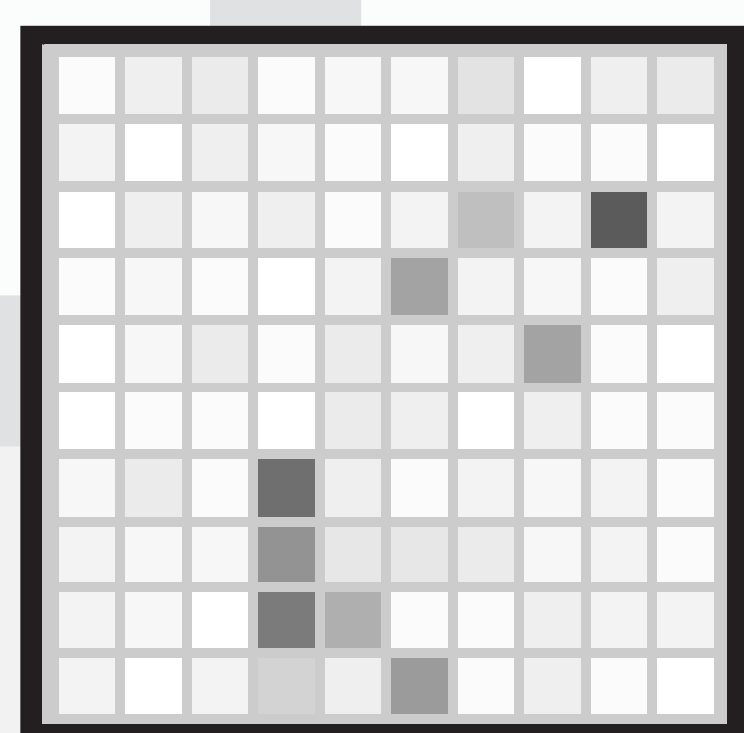
high probability that the home page will be here in the visualisation space

low probability that the home page will be here in the visualisation space

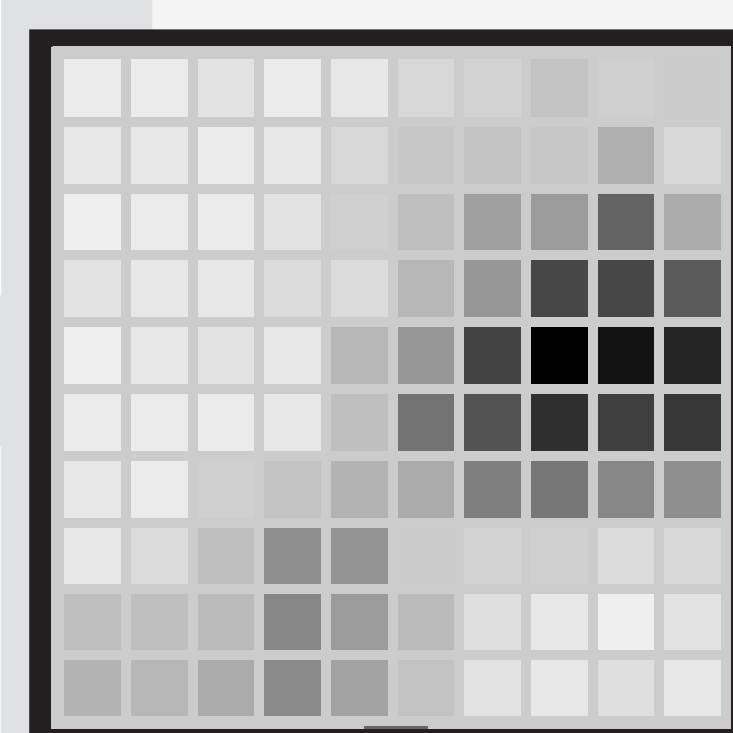
Web fields show the probability of a particular Web page being at each square of the visualisation space



hci2e/resource.html (422 visits)

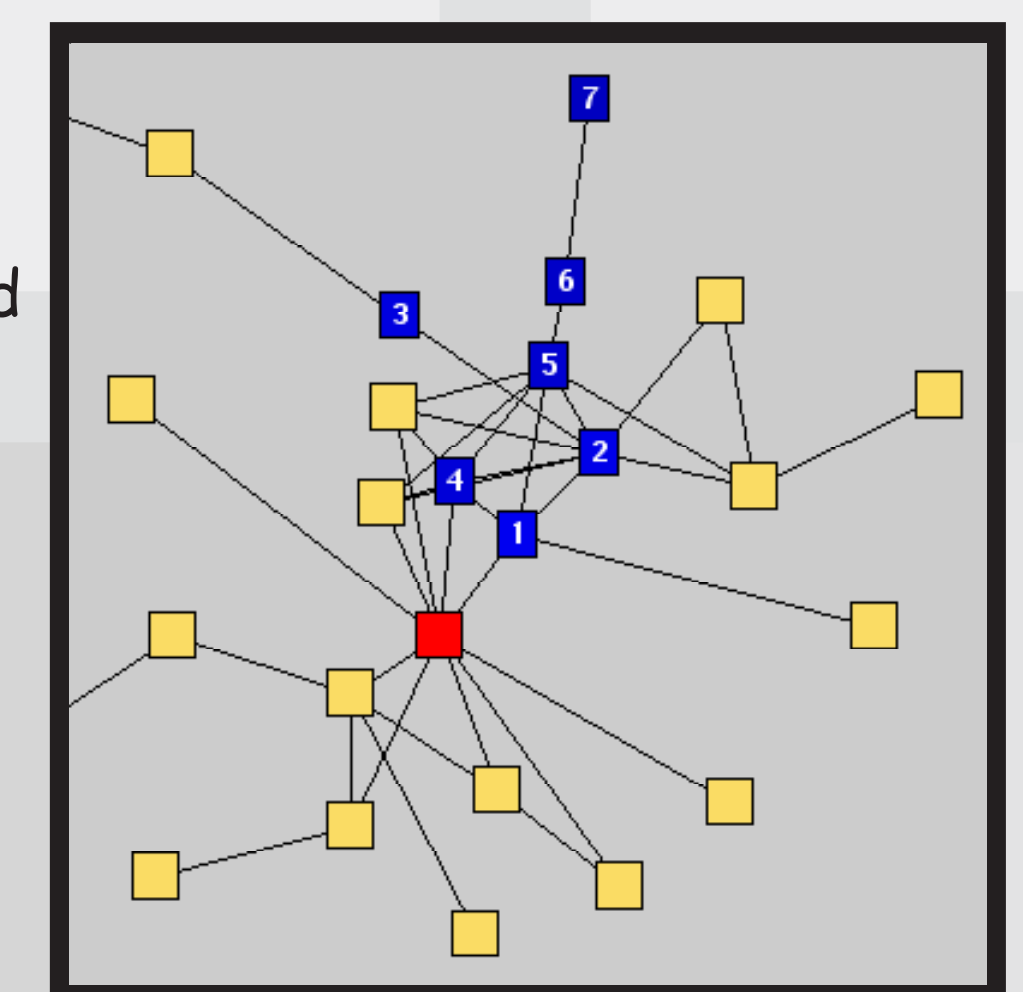


e3/chaps/ch1/links (21 visits)



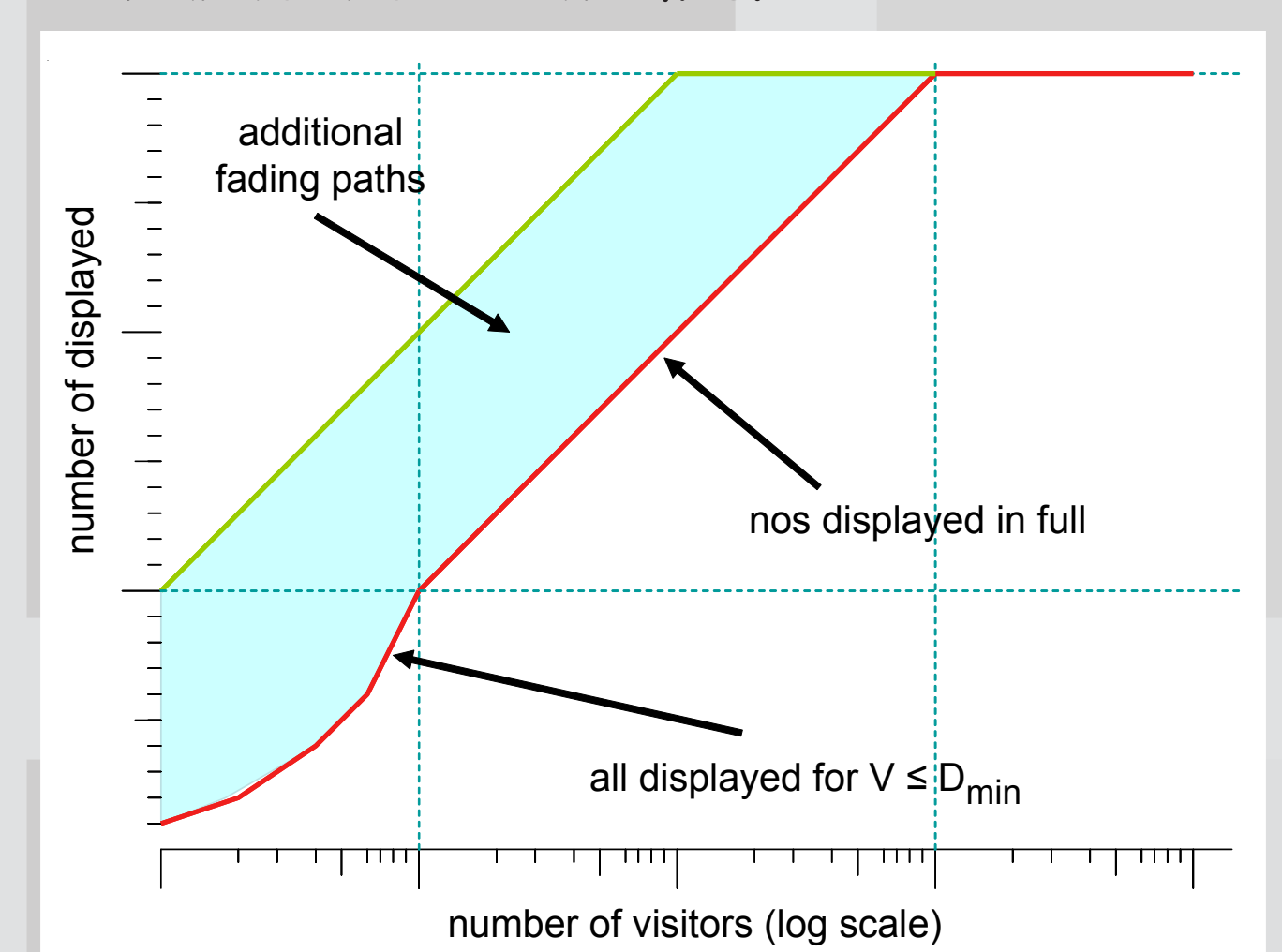
sum of the probabilities of all the web fields

a path taken by a different visitor, this time looking at an often visited group of pages



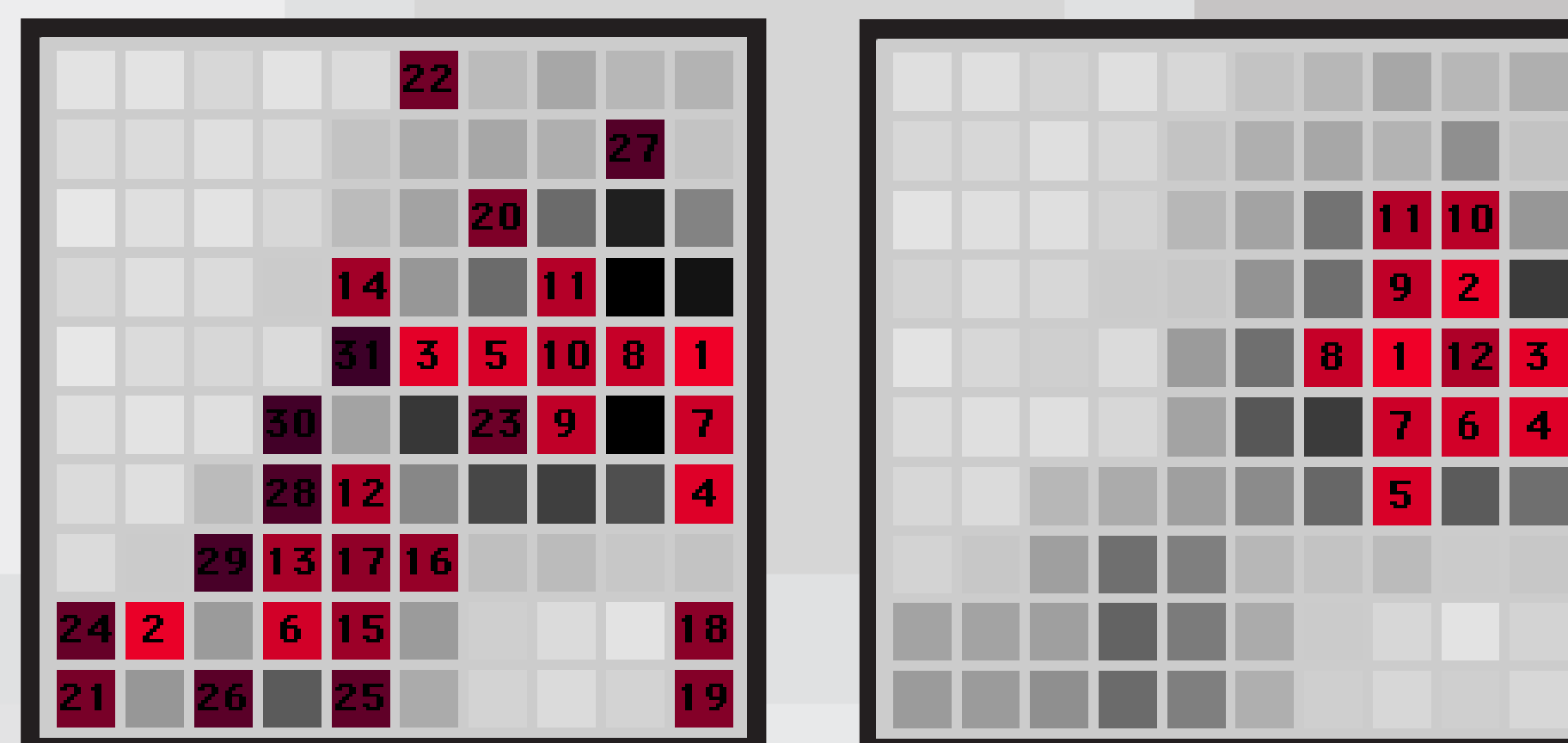
### live sampling

We need to sample visitors in order to avoid swamping the visualisation. If the site receives fairly constant number of visitors this sampling rate can be fixed. However if the site has very quiet and very busy periods then the sampling range may have to be adjusted so that the visualisation does not become either too crowded or empty. The mapping between number of visitors and number of visualized paths needs to be monotonic to give some sense of business, but non-linear to avoid extremes.



### paths through Web Fields

In the quantum world, particles only get a single location when they are observed. Similarly, when a session visits a page, a single square is coloured as the 'wave function' collapses. The location for the page is chosen in a random, yet proportionate manner, based on the probabilities in the page's web field. The location of subsequent pages in the session also depends on their web field, biased by the distance from the last visited page. The overall effect is that a session path visits a series of squares that tend to be close to one another, but have the occasional jump across the net.



The squares are numbered with the order in which they are visited