R/qtl

Lines of code

Year

0 5000 10000 15000 20000 25000 30000 35000

idea svn git

R C doc
Intercross

P₁

×

P₂

F₁

×

F₁

F₂
QTL mapping

The graph shows LOD scores across different chromosomes. The chromosomes are labeled from 1 to X, and the LOD scores range from 0.8 to 1.1. The inset highlights specific LOD score ranges for BB, BR, and RR genotypes.
The “future”
Multi-parent populations

Valdar et al., Genetics 172:1783, 2006
Challenges: diagnostics

kbroman.wordpress.com/2012/04/25/microarrays-suck
Challenges: scale of results

genotypes

phenotypes
Challenges: scale of results

genotypes
phenotypes

results
Challenges: organizing, automating

genotypes  phenotypes
Challenges: organizing, automating

- genotypes
- phenotypes
Challenges: organizing, automating

- genotypes
- phenotypes
### Challenges:

organizing, automating

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Challenges: organizing, automating

genotypes
phenotypes
Challenges: organizing, automating

genotypes

phenotypes
**Challenges:** organizing, automating

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Challenges: metadata

What the heck is FAD_NAD SI 8.3_3.3G?
What was the question again?
The ridiculome
Multivariate phenotypes
Multivariate phenotypes
Composite phenotypes

Good things
Good things

- HMM code
- basic user interface
- comprehensive
- diagnostics and data visualization
- quite flexible
Bad things
Stupidest code ever

```r
n <- ncol(data)
temp <- rep(FALSE, n)
for(i in 1:n) {
  temp[i] <- all(data[2,1:i]=="")
  if(!temp[i]) break
}
if(!any(temp)) stop("...")
n.phe <- max((1:n)[temp])
```
## Input file

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<th>B</th>
<th>C</th>
<th>D</th>
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</tbody>
</table>
Open source means everyone can see my stupid mistakes
Open source means everyone can see my stupid mistakes.

Version control means everyone can see every stupid mistake I’ve ever made.
Baroque data structures

\texttt{attr(mycross$geno[["X"]])$probs, "map"}
R/qtl2

- High-density genotypes
- High-dimensional phenotypes
- Multi-parent populations
- Linear mixed models
R/qtl2: Let’s not make the same mistakes

- C++ and Rcpp
- Simpler documentation
- Unit tests
- A single “switch” for cross type
R/qtl2: Let’s not make the same mistakes

- C++ and Rcpp
- Simpler documentation
- Unit tests
- A single “switch” for cross type
- Split into multiple packages
- Yet another data input format
- Flatter data structures, but still complex

kbroman.org

github.com/kbroman

@kwkbroman