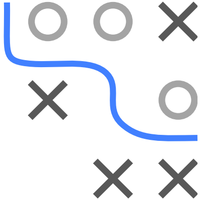
Optimization in Machine Learning

Second order methods
Optimization in R

Learning goals

- `optim()`

OPTIMIZATION IN R



Function **optim()** from base R provides algorithms for general optimization problems:

- **Brent:** Only for one-dimensional functions. Use the function **optimize()**. Can be useful if **optim()** is called within another function.
- **CG:** conjugated Gradient Methods
- **BFGS, Quasi-Newton**

OPTIMIZATION IN R / 2

General Call:

```
optim(par, fn, gr, method, lower, upper, control)
```

- **par** starting values of the parameters to be optimized
- **fn** (objective) function, to be optimized (default: minimized)
- **gr** gradient / derivative with corresponding method
- **method** optimization method (see above)
- **lower/upper** boundaries for optimization (L-BFGS-B)
- **control** List of control parameters