

Practice Breaking down of QRSdet algorithm

Lukas Kohlhase

February 27, 2017

We will look at the individual sub functions, and then the main one

1 Filters

The main filter function:

```
int QRSFilter(int datum,int init)
{
    int fdatum ;

    if(init)
    {
        hpfilt( 0, 1 ) ;    // Initialize filters.
        lpfilt( 0, 1 ) ;
        mvwint( 0, 1 ) ;
        deriv1( 0, 1 ) ;
        deriv2( 0, 1 ) ;
    }

    fdatum = lpfilt( datum, 0 ) ; // Low pass filter data.
    fdatum = hpfilt( fdatum, 0 ) ; // High pass filter data.
    fdatum = deriv2( fdatum, 0 ) ; // Take the derivative.
    fdatum = abs(fdatum) ;        // Take the absolute value.
    fdatum = mvwint( fdatum, 0 ) ; // Average over an 80 ms window .
    return(fdatum) ;
}
```

Basically just takes the separate ones listing functions

1.1 lpfilt

A low pass filter based on the equation $y[n] = 2 * y[n - 1] - y[n - 2] + x[n] - 2 * x[t - 24ms] + x[t - 48ms]$.

Two additions for bookkeeping purposes.

Main equation is two left shifts and three additions.

1.2 hpfilt

A high pass filter based on the equations

$$\begin{aligned}y[n] &= y[n-1] + x[n] - x[n-128ms] \\z[n] &= x[n-64ms] - y[n];\end{aligned}$$

2 Main Algorithm