
Subject: Approximate distance calculation
Posted by [mirek](#) on Sat, 26 Aug 2017 07:55:49 GMT
[View Forum Message](#) <> [Reply to Message](#)

While working on OSD firmware for my FPV plane, I have started playing with the idea how to calculate fast distance approximation:

```
int ihypot(int x, int y)
{
    if(x < 0)
        x = -x;
    if(y < 0)
        y = -y;
    if(x < y)
        Swap(x, y);
    if(y < (x >> 2) + (x >> 3))
        return x + (y >> 3) + (y >> 5);
    y -= (x >> 2) + (x >> 5);
    return x + (y >> 1) + (y >> 4);
}
```

This is approximation of $\sqrt{x*x + y*y}$.

- if $\max(x, y) < 168$, absolute error < 4 (this has more to do with integer rounding)
- otherwise, the error is less than 2%

Putting it here so that perhaps it can be googled if somebody is looking for something like it...
