# simplest minimization

Assume angular velocity at time ti, and uniform acceleration α during the time interval ti to ti+1.

The new angular velocity will be

and the radial accelerations are therefore

giving

where we used

(1)

By ignoring[[1]](#footnote-1) the term in, this simplifies to

which can easily be solved for r.

after which alpha is easily found.

From the full expression, we can use minimization methods to find the optimal value for r, i.e.

form a cost function

and minimize against r.

Warmup method for minimization problems: Use the known value of alpha, and just minimize to find r.

i.e. use cost function

where alpha is a known fixed value.

1. The assumption is that , which implies ; ;

   i.e. the change in omega is much smaller than its current value. This assumption would seem to fail near zero speed, with large accelerations. eg a “kickstart” scenario. [↑](#footnote-ref-1)