

Eikonals

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- *From:* DGoncz@xxxxxxx
 - *Date:* Tue, 25 Oct 2005 22:28:57 +0000 (UTC)
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Hello, spr!

Here are some questions that may stimulate debate here.

1: Does light follow a geodesic or an eikonal? I worked out a simple case from point A in empty space to point B in a refracting medium, at an incidence that would not cause TIR. I found the path light would take to be the fastest, not the shortest path from A to B.

2: Given a plane tilted from normal to local gravity, a ball that can roll on the plane, and points A and B on the plane. Assume B on a strike to A, that is, B and A at the same altitude, but distinct. These are terms from civil engineering. Strike is normal to dip, if I remember right. Assume the ability to impart a single initial impulse to the ball, of any magnitude and direction. This initial impulse has magnitude mv and associated initial kinetic energy $\frac{1}{2} m * v^2$, and results, in the interesting cases, in a trajectory from A to B, with time t . Minimize the product $E*t$.

3: Given a piece of terrain, with analytic characteristics as follows: continuous and continuously differentiable at every point, finite in extent, and finite in variation from the mean altitude, is there an eikonal between points A and B on this terrain for a bicycle? Make some assumptions about bicycles and discuss. You might choose to minimize $E*t$, for an "E-eikonal".

What I am doing here is working on a smart bike. 12VDC interfaces to power many but not all GPS, PDA, and laptops are available, but 110 VAC interfaces are ubiquitous. I have ordered a 600 W rating front drive hub of brushed, gearless design for my experiments, and have regulators and inverters coming out my ears. This hub will be used as a generator.

My goal is to supply small amounts of 110 VAC to various technologies to inform, not propel the rider. We may assume the rider has the intent and priorities of a bicycle courier, but the application is actually military.

A small SEIG is under development but successful small, slow SEIGs are

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rare, so for now, the generator/inverter option provides best hopes for success.

I'll post a video link tomorrow. I have to catch a ride to work now.
How ironic....

Yours,

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- *Follow-Ups:*

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- ◇ *From:* DGoncz

- ◆ **Re: Eikonals**

- ◇ *From:* Cl . Massé

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