
Subject: Re: fitting many linear eqs simultaneously with outliers
Posted by [Bringfried Stecklum](#) on Fri, 14 Oct 2011 09:32:02 GMT
[View Forum Message](#) <> [Reply to Message](#)

Jeremy Bailin wrote:

- > So I have a large number of very simple linear equations, which all look
- > like:
- >
- > $a_i + b_i x_{ij} = a_k + b_k x_{kj}$
- >
- > for $i,k=1..N$ (all unique combinations of i and k), $j=1..M$. The data
- > values x_{ij} and x_{kj} are measurements of the brightness of object j in
- > images i and k respectively, where the images have an unknown zero point
- > and scalings that I am trying to determine.
- >
- > (aside to astronomers: this may sound suspiciously like re-implementing
- > mscimatch)
- >
- > Not all objects appear in all images, so there are different numbers of
- > equations relating each pair of images. In principle, any number of
- > linear solvers should work... BUT: it needs to be extremely robust to
- > outliers. I know for a fact that there are many many many outliers, and
- > there are some pairs of images where it looks like pure scatter. So I
- > need some sort of solver that will do sigma clipping. Essentially, I
- > want a sigma-clipping linear least squares solver that can solve more
- > than one line at once.
- >
- > Does anyone know of such a beast already existing? Or something that's
- > vaguely similar enough that I can use it as a basis?
- >
- > -Jeremy.

Perhaps fitting a line in 3D may serve as a starting point. From looking at the equations a generalization to higher dimensions seems feasible.

<http://www.scribd.com/doc/31477970/Regressions-et-trajectoir-es-3D>

cheers, Bringfried
