
Subject: Re: Bootstrapping / Resampling
Posted by [Theo Brauers](#) on Tue, 12 Sep 2000 08:05:45 GMT
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Hi Amara, hi Fraser.

Amara Graps wrote:

>
> Dear Fraser,
>
>> I am using a routine to fit a circle to a set of edge detected points.
>> This gives me the radius R_0 and the centre point (X_0, Y_0) .
>>
>> I would like to obtain an estimate of the error/uncertainty in these fit
>> parameters. I understand that Bootstrapping or resampling may be away to
>> estimate these uncertainties.
>>
>> 1. Are Bootstrapping or Resampling the techniques to use ?
>
> There's a large body of literature, especially in the computer graphics
> field and astronomy field, for fitting circles (ellipses) to points.
>
> I think that bootstrapping is overkill for what you want. I suggest
> a linear or nonlinear fit, and using the error that naturally pops
> out of the least-squares fit.
>
>
>

First I must admit that I was unaware of the pitfalls of fitting a circle.
(Amara's contribution opened my eyes.) However, I am a fan of Bootstrap
techniques and I think that repeating Amara's procedure with a BS resampled
set of (x_i, y_i) data points will give the required parameter errors (ESD).
The set of BS parameter estimates can be analyzed and this procedure will
give better parameter ESDs especially if the requirements for a unbiased
least squares estimation are not given: i.e the different (x_i, y_i) are not
independently sampled as a result of smoothing or lowpass filtering.

Cheers
Theo

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