Code for terrain-following interpolation

Ingrid Angel <Ingrid.Angel@bsh.de>   Thu, Jul 1, 2021 at 7:21 PM
To: "kaiheyamazaki@gmail.com" <kaiheyamazaki@gmail.com>

Dear Kaihe,

Many thanks for your positive an enthusiastic answer. I just check the link and is working properly. I am still learning to use python but I will try your code (probably after summer) and go back to you if I have questions.

I just sent you an invitation to our github (euroargodev - https://github.com/euroargodev) where we share all kind of codes related to argo floats, it would be great if you consider sharing your code there too. The repository can still be made private (shared with only a few people) so it does not mean you have to make it totally public and still reach people that will actually need the code and contribute for its improvement (like me and our French colleagues with floats in the Baffin Bay).

Best regards,

Ingrid

Von: Kaihe Yamazaki <kaiheyamazaki@gmail.com>
Gesendet: Donnerstag, 1. Juli 2021 08:59
An: Ingrid Angel <Ingrid.Angel@bsh.de>
Betreff: Re: Code for terrain-following interpolation

Dear Ingrid,

Thanks for contacting me!

Actually, this is the first time to share the terrain-following interpolation code. Please check the shareable link.

https://drive.google.com/drive/folders/1ZfPAXRfMgXIM8U95FWpMp8PEgI_1LmAJ?usp=sharing

For a trial, you can interpolate testData.csv with the GEBCO topography (GRIDONE_1D.nc).

The result of interpolation is presented in two .png files, in which interpolated positions (green) seem to follow the isobaths.

(Yellow points are linearly interpolated positions, while not all position-lacking data have linearly interpolated positions by default.)

This scheme is slightly modified from Yamazaki+(2020), such that the "backward revision" for interpolated positions obtained by forwarding interpolation (Fig.A, panels c-d) is replaced with the "weighted average" for the forwarding and backwarding interpolations, with a weighting function defined from inverted distances from the first and last points of the interpolation section. This modification greatly reduces "asymmetry" in interpolated positions, which can result in sharp artificial curves near the end of the interpolation section to connect to the positioned point. By customizing the weighting function and tuning parameters (the length of search range and the searching resolution), you may optimize the scheme for your purpose.

I hope this code will facilitate further utilization of under-ice legacies and progress in polar oceanography.

Please freely ask any questions.

Note, I will be offline from 7/12-8/26 to participate in a research cruise. Sorry for this inconvenience.

Best regards,

Kaihe

On Tue, Jun 29, 2021 at 9:17 PM Ingrid Angel <Ingrid.Angel@bsh.de> wrote:

> Dear Kaihe,
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> I recently read your JGR paper where you use a terrain-following interpolation scheme to estimate Argo floats positions under ice. I work with Argo-Germany and the Euro-Argo RISE project and we would like to try your method on our floats in the Arctic.
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> Would be possible for you to share the scripts for the interpolation with us?
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> Best regards,
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> Ingrid
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Kaihe Yamazaki