Dr. Nathaniel A. Frissell Ph.D.

From: Nick Callahan <nwcallahan@crimson.ua.edu>
Sent: Tuesday, June 4, 2024 9:23 PM
To: Dr. Nathaniel A. Frissell Ph.D.; Bill Engelke
Cc: Mary Lou West
Subject: Re: [EXTERNAL] Re: Request for LSTID Detection Plots
Attachments: ionospheric_edge_detection.zip

Hopefully the attached is enough for replication, but here's the outline for the files...

`Run.ipynb` : Main file for generating plots & data. The guts are in the .py files, but the plotting and current parameters are defined here.

`data_loading.py`, `threshold_edge_detection.py`, `utils.py` : Core functions, these could be a single file as I've moved a lot of things around and removed most of the testing functions. Primary use is preprocessing the data from CSVs into a Xarray DataSet, iterating through that by date (accompanied by labels) via the `DateIter` class, then applying thresholding for each image. Actual thresholding is not much code now that the different attempted methods have been trimmed down.

`official_labels.csv` : A concatenation of Mary Lou's labeled spreadsheets, which is only used for labeling evaluated data. Current script doesn't rely on this for analysis, but it can be added to the plots.

`main_requirements.txt` : Pip requirements file, this is a shorthand of the main library versions, I may have left out some relevant versions. Didn't include the versions for Jupyter.

`raw_data/` : Sample directory of the files I use for data reading. These come straight from the Box, the date reading is done by a simple split on underscores, so after the date everything is discarded in the file name. Something like $PREFIX_$DATE*.csv is suitable for parsing.

From: Dr. Nathaniel A. Frissell Ph.D. <nathaniel.frissell@scranton.edu>
Sent: Tuesday, June 4, 2024 8:06 AM
To: Nick Callahan <nwcallahan@crimson.ua.edu>; Bill Engelke <wdengelke@retiree.ua.edu>
Cc: Mary Lou West <westm@mail.montclair.edu>
Subject: RE: [EXTERNAL] Re: Request for LSTID Detection Plots

Hi Nick and Bill,

Thank you very much for sending this.

Is it possible that I could see the code and run this myself on lstid.scranton.edu? I'd really like to understand myself how all of this is implemented.

Best,
Nathaniel

From: Nick Callahan <nwcallahan@crimson.ua.edu>
Sent: Friday, May 31, 2024 8:57 PM
To: Bill Engelke <wdengelke@retiree.ua.edu>; Dr. Nathaniel A. Frissell Ph.D. <nathaniel.frissell@scranton.edu>
Cc: Mary Lou West <westm@mail.montclair.edu>
Subject: Re: [EXTERNAL] Re: Request for LSTID Detection Plots

This is a file for the edge detections between Nov 1st 2018 and May 31st 2019. Columns are the individual dates, index is the minutes starting at 12:00:00 UTC (to 23:59:00 UTC). Values are pixels of height in the plotted values, so if the data is shape (720, 300) per day this should match up. Values are currently unsmoothed, I used the 40th percentiles for selecting between proposed edges as supported by Mary Lou's analysis of the proposed edges. I have all the image plots and data cached, so if you want specifics or adjustments to these (plots, smoothing, etc.) just let me know.

From: Bill Engelke <wdengelke@retiree.ua.edu>
Sent: Friday, May 31, 2024 7:03 AM
To: Dr. Nathaniel A. Frissell Ph.D. <nathaniel.frissell@scranton.edu>; Nick Callahan <nwcallahan@crimson.ua.edu>
Cc: Mary Lou West <westm@mail.montclair.edu>
Subject: Re: [EXTERNAL] Re: Request for LSTID Detection Plots

Hello Nathaniel:

OK, we are pursuing a couple of tracks:

1. I ran all the dates in the time frame using my last algorithm, and for each produced a set of plots and also for each day there is a csv file containing the values in the detected curve. You can find this in the UA Box at:

   Box\share\multisource_plots_and_data\curve_comboplots4

   You should have access to that.

2. Nick is running the curves using his latest algorithm which finds multiple edges; we will let you know when we have a result on that.

Let us know what else we can do to assist.... -73- Bill

From: Dr. Nathaniel A. Frissell Ph.D. <nathaniel.frissell@scranton.edu>
Sent: Thursday, May 30, 2024 12:00 PM
To: Bill Engelke <wdengelke@retiree.ua.edu>; Nick Callahan <nwcallahan@crimson.ua.edu>
Cc: Mary Lou West <westm@mail.montclair.edu>
Subject: [EXTERNAL] Re: Request for LSTID Detection Plots

Hi again, Bill and Nick.

If you are able to get this to me soon, I'm hoping to take a crack at using them to do the LSTID classification myself. If it works, we can include those results on the CEDAR poster.

73 de Nathaniel

> On May 29, 2024, at 11:07 PM, Dr. Nathaniel A. Frissell Ph.D. <nathaniel.frissell@scranton.edu> wrote:
>
> Hi Bill and Nick,
>
> Mary Lou and I are working on revisions for the GRL manuscript. I think it might be useful if I could have the latest version of the LSTID detection plots (like the one attached) for 1 November 2018 - 1 May 2019.
>
> Would you be able to send me these plots, as well as the detected red line in numerical/CSV form?
>
> Thank you so much,
> Nathaniel
>
> <2023-12-22_NA_20m.png>
> ---
> Nathaniel A. Frissell, Ph.D., W2NAF
> nathaniel.frissell@scranton.edu
> Associate Professor
> Department of Physics and Engineering
> University of Scranton
> HamSCI Lead

Please use your best judgment when opening attachments, clicking links, or replying to this email. Questions or concerns should be directed to the Technology Support Center at (570) 941-4357 or techsupport@scranton.edu.