Band search program

1. Background

EBSD (Electronic Back Scattering Diffraction Pattern) method is developed in 1st half of 1990 as the technical method to observe the material’s micro component structure. It is the method to measure the crystal orientation and judge crystal system of the area observed, using the indexing result from EBSD pattern obtained by SEM’s scanning the material’s surface.

1. Outline

EBSDBandSearch version 1.0 is a group of programs to execute band-search of EBSD image.

Our EBSD analysis system separated by 2 steps as in below and this program is for Step 1.

Step 1: Bad Search

Step 2：Indexing (here) (using output result Step 1)

EBSDBandSearch program detects the bands from EBSD image, calculates combination (ρ,θ)(ρ:distance of band line from image origin, θ: angle of band line ) of all detected bands, convert them to spherical coordinate system which will be used in indexing program (Step 2) and outputs the result to the 2 text files.

1. Preparation

OS : Windows10 or 11

Environment of programming Python code: Anaconda, Python 3.10 or later

Library : scikit-image, numpy, matplotlib

1. How to use
2. Download the programs and install them in your PC. (here)
3. Put your EBSD image in ‘Sample’ folder with folder config as shown in below:

EBSD image formats of png, jpg and tif are available.

Sample - folder name – EBSD image file (png, jpg or tif)

* Output (empty folder)

or

Sample - folder name – sub folder name - EBSD image file (png, jpg or tif)

* Output (empty folder)

– sub folder name - EBSD image file (png, jpg or tif)

* Output (empty folder)

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1. Put files of ebsd.py & file.py in same folder as EBSD image file.

* file.py (put EBSD image file path)

file = ???????/filename.png (or jog, tif)

* ebsd.py (put information of EBSD image)

PC0 = [PCx, PCy, PCz]: origin: upper left corner of the EBSD image

Circle = True or False (True: circle shape, False: rectangle shape)

1. Change bansdsearch.bat and save it as shown in below:

* Folder name of anaconda to yours in below line.

“call C:\Users\?????\anaconda3\condabin\conda activate”

* Folder (of EBSD mage) names in Sample older to yours in below line

“for %%j in (Sample, Sample\Zn, Sample\Ni) do (“

1. Change bandsearch0.bat and save it as shown in below:

* Folder name of anaconda to yours in below line.

“C:\Users\?????\anaconda3\python.exe main.py”

1. In the command prompt, change the directory where bandsearch.bat exists.
2. Execute bat file with the command “.\bandsearch.bat
3. After log history display is ended, you can get the pdf which shows band search result in the same folder as EBSD image. (Refer the file Sample/Zn/ Zn.tif.out.pdf)
4. Data (data0.txt, data1.txt) for indexing in output in “output” folder.

The difference of data0 & data1 is the case of use band width (0: No or 1: Yes)

(Refer the files Sample/Zn/ output/data0.txt & Sample/Zn/ output/data1.txt)

1. When as good solution is not found.

If you find a case unsolvable by band search, it is very important information for us, because it may be related to unknown bugs.  
I appreciate if you kindly send us your input files to the following address.

• tomiyasu.ryoko.446@kyushu-u.ac.jp

1. How do I report bug.

You should send us a bug report with all of the input and output files attached (including EBSD image file) to the following e-mail address:

• tomiyasu.ryoko.446@kyushu-u.ac.jp

1. About the copy right

The source codes are distributed as open source under the MIT license on the [repository list](http://en.sourceforge.jp/projects/conograph/scm/svn/tree/head) of the project.

1. Acknowledgement

I would like to express my gratitude to those who offered the project.