

FAD8 and iFAD8 Manual

Last edit: Oct. 6, 2019

Copyright (c) 2019 Pengfei Wu, Jintao Liu, Xiaole Han, Yangyang Liu and Junyuan Fei

All copyrights of FAD8 and iFAD8 belong to Pengfei Wu, Jintao Liu, Xiaole Han, Yangyang Liu and Junyuan Fei, the original developers. FAD8 and iFAD8 are freely available for academic uses. We are not responsible of any extended application result of these two algorithms. The original paper [Wu *et al.*, 2019] should be cited appropriately whenever FAD8 or iFAD8 is used. The source code or compiled execution file provided here cannot be used for any commercial use without the consent with us. The commercial use hereby includes any kind of consulting works carried out by academics.

1. File Description

You may find two files and two folders in this project.

1. README.pdf: FAD8 and iFAD8 manual.
2. Himmelblau.txt: an ASCII DEM file for example discretized from the Himmelblau terrain proposed by *Orlandini et al.* [2014] (1 m resolution; 501×501 cells)
3. code folder: include a folder called FAD8&iFAD8, which is a project of Eclipse code editor.
4. release_version folder: include FAD8 and iFAD8 executable file compiled for Windows.

Reference:

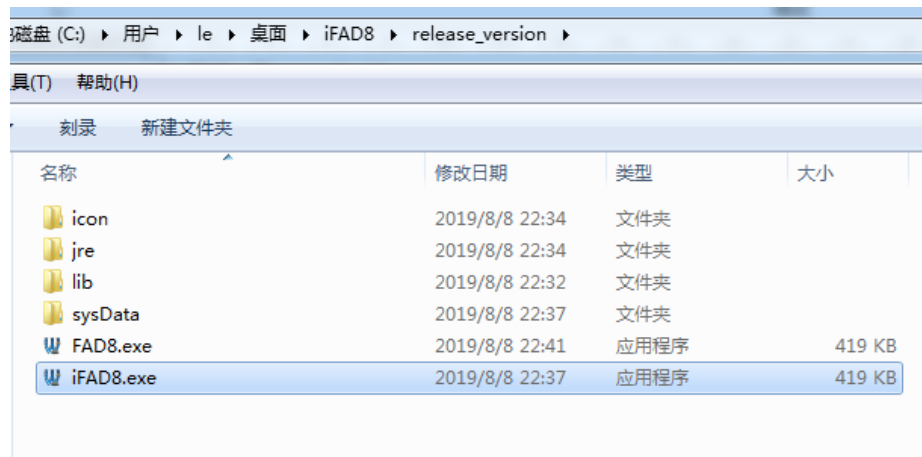
Orlandini, S., G. Moretti, and A. Gavioli (2014). Analytical basis for determining slope lines in grid digital elevation models. *Water Resour. Res.*, 50(1), 526–539, doi:10.1002/2013WR014606.

2. Running FAD8 and iFAD8

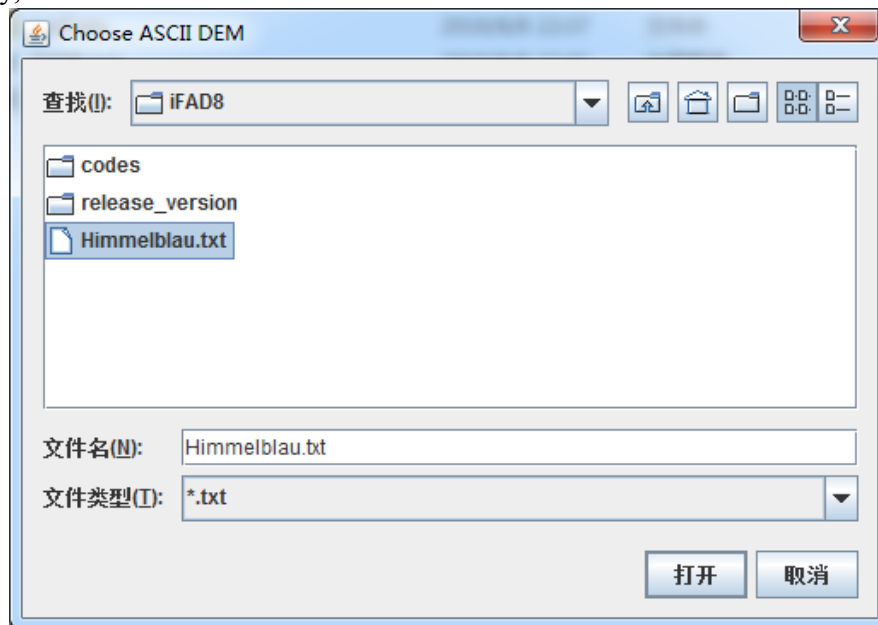
Here we only provide the executable file compiled for Windows. Please keep the files and folders in the folder called release_version intact. You can run FAD8 or iFAD8 using the FAD8.exe or iFAD8.exe in release_version folder, respectively. After setting the path of DEM file and the path to save the drainage direction file, the algorithm will be executed.

Here an example is provided.

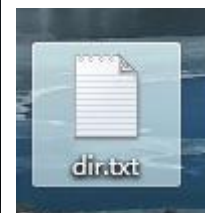
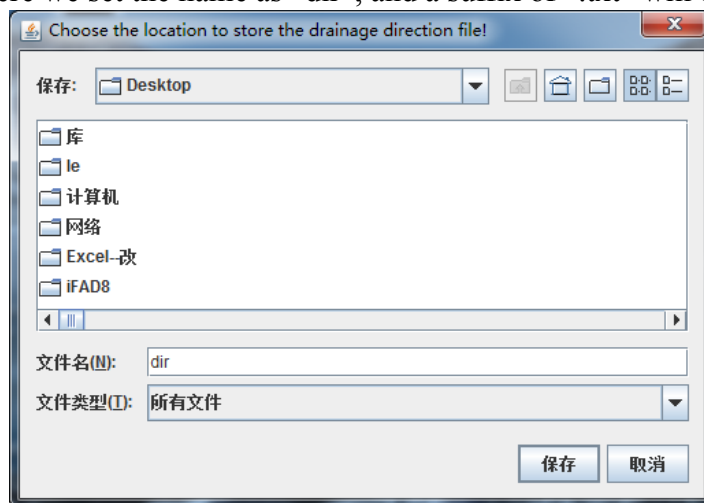
Firstly, run the executable file such as iFAD8.



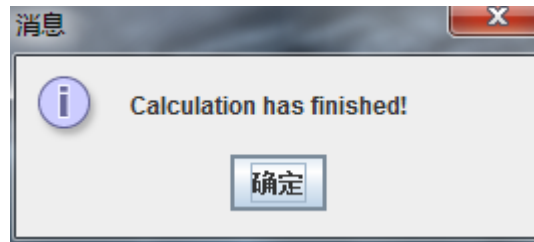
Secondly, choose the DEM file.



Finally, choose the location to save the drainage directions and name the direction file. Here we set the name as "dir", and a suffix of ".txt" will be added automatically.



When the calculation is finished, a message dialog will appear.



3. Java source codes

The Java classes can be found in “iFAD8\codes\FAD8&iFAD8\src\algorithm\”. And you can import the FAD8&iFAD8 folder in “iFAD8\codes\” to Eclipse code editor as an existing project. Detailed remarks are in the classes.

4. Things to keep in mind

- The import DEM should be in the ascii TXT format.
- Codes for depression removal have been contained, so a real-world DEM with depressions and flats can be imported directly.
- The outcome drainage directions are in the Esri format, which can be imported into ArcGIS using the function called ascii to raster.
- A Java structure called PriorityQueue is used to sort the cells with elevations from high to low. Limited by the maximum length of PriorityQueue, the number of cells in the DEM cannot be more than 2 147 483 647, including nodata cells. Of course, an improvement to the limitation is welcome.

If you have any questions, please feel free to contact Pengfei Wu (wpf@hhu.edu.cn) or Jintao Liu (jtliu@hhu.edu.cn).